DELIVERING RELIABLE AUSTRALIAN COAL EXPORTS TO THE WORLD

COAL TRANSPORT INFRASTRUCTURE

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1. Executive Summary

Australia cannot afford poor and uncoordinated infrastructure decisions that impose high costs on the community, the economy and the environment. The existing planning and decision-making framework is short-term, ad hoc and fragmented across transport modes and jurisdictional boundaries. The development and implementation of a national vision for critical land transport links is vital.[1]

Background

Strong increases in world demand especially by China and India, have led to sharp increases in prices for coal and have placed pressure on Australian coal supply chains. Bottlenecks in Queensland and New South Wales coal supply chains are currently restricting, and adding to the cost of Australian coal exports.

Australian, NSW and Queensland Governments, industry and infrastructure providers are developing strategies to improve efficiency. Australia's reputation as a reliable coal supplier is at stake.

Strong growth in coal export volumes over recent years has eroded spare coal transport infrastructure capacity. The magnitude and duration of this growth was no predicted by coal producers, infrastructure providers or governments around the world. In 2004 it became evident that coal throughput demand was already exceeding the capacity of some coal chains, most notably in the Hunter Valley, and that throughput was quickly approaching capacity limits in other coal chains. The long shipping queues off Port of Hay Point, serving two coal loading terminals including Dalrymple Bay Coal Terminal, early in 2005 indicate that capacity has also been reached in some parts of the coal supply chain in Queensland.

To address impediments to Australian coal chain infrastructure in Australia, the Hon Ian Macfarlane MP Minister for Industry, Tourism and Resources, announced in June 2004 that he would convene an Australian Government Senior Officials Group, chaired by his Department and to include the Departments of Foreign Affairs and Trade; and Transport and Regional Services to conduct an independent analysis of coal transport infrastructure and report on short and long term measures to address infrastructure issues related to the coal industry including improving coal supply chains.

The Government has a direct and broad interest in seeing the development of sufficient capacity, more effective and efficient coal transport infrastructure to facilitate economic and export growth, innovation and increase Australia's international competitiveness.

This report, ***Delivering Reliable Australian Coal Exports to the World - Coal Transport Infrastructure***, is a Senior Official's Group Report to the Australian Government and the Export and Infrastructure Taskforce as part of their broader deliberation of issues that are having an impact on the performance of Australia's export infrastructure. This Report is presented with a view that further discussions are held with the Queensland and New South Wales State Governments, the Australian coal industry and infrastructure providers.

The Report has been prepared in consultation with key stakeholders from the coal industry, transport infrastructure owners and operators, rail and port authorities and relevant Australian and Queensland and NSW Government officials. The Report draws on global coal market forecasts by the Australian Bureau of Agriculture and Resource Economics (ABARE) and includes a case study of the Hunter Valley coal supply chain through an ABARE census of Hunter Valley coal producers undertaken from September 2004 to March 2005.

[1] Australian Government *Auslink Land Transport White Paper 2004*

Constraints and factors impacting on major Australian coal supply chains as well as system-wide issues are discussed. The report and key areas of strategy focus on a 'whole of chain' response. No single component of the chain is solely responsible for constraints. Each strategy builds on the other and should be considered collectively to ensure reliable Australian Coal exports to the world and strategies for timely infrastructure investment to be considered. In particular, the risks of investing in new capacity too early are balanced against the costs of not having capacity available when it is needed to respond to surges in demand and very favourable trading conditions as currently being experienced by the Australian coal industry and which ultimately would help Australia's export income and balance of payments.

The consequences of not responding to these issues are substantial. ABARE estimates that if coal supply chain constraints in the Hunter Valley are not addressed the resulting losses in coal export revenue will amount to up to $7.9 billion in net present value terms in the ten years to 2015. This translates to losses of up to $8.6 billion in Gross State Product in New South Wales and 1934 coal industry jobs.

Corresponding losses in Queensland have not been estimated, but are likely to be substantial.

Major Findings

Each link in the coal chain has sufficient discrete capacity to handle the current demand for coal, however given that the coal chain is a linear chain from the loading of coal at the mine through to ship loading at the Port, the capacity of the entire chain tends to be less than the individual components. This can be for many reasons, including the coordination and logistics required to plan a complicated system or that different owners and operators of discrete parts of the chain have different business priorities.

From the consultations conducted by the Senior Officials Group it has been evident that constraints on the capacity to export coal varies between New South Wales and Queensland and furthermore, between different exporting ports and terminals in each state. The cause of the constraint can vary on a weekly basis and with the system balanced and relying on a 'just in time' principle, any failure in one link of the coal chain has the capacity to severely constrain the entire coal chain and reduce delivery to and export from the port.

While the report is relevant to coal supply chains and loading facilities in the whole of Australia, the main focus is on the Hunter Valley coal supply chain and the Dalrymple Bay coal supply chain.

If coal supply chain constraints are not addressed now and new investments are not brought forward expeditiously, Australian coal export opportunities will be lost.

The following box details the major findings of the Senior Officials Group, as obtained through a series of site visits and consultations. These comments constitute a suite of issues raised by individual stakeholders.

Transport infrastructure in the Hunter Valley coal supply chain in New South Wales

- General
  - There have been major improvements in communication along the coal chain, but substantial further improvements are needed.
  - Each component of the coal chain has issues to address and some different prespectives on factors constraining capacity along the coal supply chain.
  - There are insufficient penalties/incentives to optimise chain capacity.
- Investment
  - Plans for expansions along the supply chain have been announced but need to be progressed now without further delay.
  - Investment/expansion plans must take account of the need to expand the service to

accommodate new mines further inland.

- Rail track
  - bottlenecks near the port are exacerbated by north-south crossover traffic and passenger services.
  - maintenance has been historically inadequate.
  - Bi-directional signalling is a major issue - trains can only travel in one direction at some sites blocking rail loops and increasing haulage time.
  - Single rail line between some coal loaders and PWCS does not allow incoming and outgoing trains to travel at the same time.
  - Manual signalling on sections of track requires the train driver to disembark three times each way to manually change the track signals adding significant time to each journey.
- Rail scheduling
  - Scheduling systems are currently manual rather than automatic, but are being computerised.
  - There are a set number of train paths available per day for freight and passenger trains.
  - Headways (time between pathways) are narrow and if a pathway is missed, trains start to queue.
  - Train path constraints are being addressed sub-optimally by train fleet re-powering.
  - Passenger transport is prioritised and runs to a pre-determined schedule, while coal is railed on a 36 hour regime and other freight is railed according to a weekly regime.
  - ARTC and rail operators have made some initial progress in improving coal train schedules.
- Rail capacity
  - Severe grades of some sections of track - eg Minimbah and Nundah Bank result in missed pathways and greater haulage times.
  - Shorter trains with more locomotives result in greater horsepower to weight ratios. Pacific National currently runs 5,000t (53 wagons) train configurations; they used to be 9100t (83 wagons).
  - Trains beyond 80 wagons impedes arrival rates at some mines and coal loaders as the additional wagons block the rail loop.
- Rail speed inconsistencies
  - Different train speeds impact on rail capacity eg. passenger trains run at 100km/hr, wheat trains at 80km/hr and coal trains at 60km/hr, complicating scheduling and signalling logistics and effectively reducing rail capacity.
- Domestic coal rail transport
  - Increasingly, when domestic coal resources located near power stations are depleted rail transport will become a necessity.
  - From 2007, Macquarie Generation is to rail all of its coal (8-10Mtpa).
- Large variability in coal loading efficiency
  - Load point capacity is becoming a significant constraint. Load point rates vary from 1,500t/hr to 5,000t/hr, resulting in one in four load points not meeting their load times; 75 per cent compliance with plan.
  - There is a trade off between a fully loaded train and the time it takes to load.
- Terminal capacity at Port
  - The capacity distibution system at Port Waratah in 2004 resulted in coal throughput being reduced to below allocated capacity; additional flexibility has been built-in for 2005-2007, but problems remain.
  - Balanced demand load reduces flexibility.
  - Shiploading at Carrington halts when a Capesize vessel passes the terminal.
  - Carrington is designed to receive 42 wagons (compared to upto 80 wagons at Kooragong) so there are additional delays at the Terminal.
  - No space for dedicated stockpiles given the large number of users and blends; additional

blending believed to be at negligible cost, but limits stockpiling capacity.
  - Pending decision on possible new coal terminal may be impacting on expansion of existing capacity.
- Difficulties in mine production meeting quarterly allocations
  - In 2004, some larger mines did not meet production targets under the capacity allocation system. Other mines did not have the flexibility to utilise the capacity that this freed up.
  - There are often difficulties encountered in ramping up production to take advantage of shortfalls by other producers.
  - In the last months of 2004, up to 40 trains were parked empty due to decreased coal production (each train up to 8,000t/day).
- Port
  - Tidal constraints allowing only 2 Capesize vessels per tide.
- Other coal supply chain impacts
  - There is a scarcity of skilled workers.
  - Large machinery parts have long delivery dates.

Transport infrastructure issues facing the Dalrymple Bay coal supply chain in Queensland

- General
  - There are major communication difficulties along this coal chain.
  - Opaque contracts between Prime and the operator Dalrymple Bay Coal Terminal Ltd (DBCT), Prime and the mines, and mines and QR do not assist coordination of supply chain requirements.
  - Throughput at Dalrymple Bay in 2004 was significantly less than rated terminal capacity.
  - Interests of all stakeholders along the coal supply chain are not taken into account.
  - There are insufficient penalties/incentives to optimise chain capacity.
- Investment
  - Concern that decisions on investing and/or operating infrastructure are affected by regulated pricing that constrains rates of return.
  - Mines are not investing in optimal coal loaders.
  - Disputes over responsibility for investment delay, efficiency improvements and expansion plans
  - Finalisation of DBCT access fees for new investment has delayed expansion plans.
- Rail scheduling

  With increased volumes, operating arrangements need to be improved. Problems that need to be addressed include:
  - Running trains on demand rather than to schedule.
  - Train size uncertainty - there is a variance of up to 20 per cent in capacity of trains arriving at coal loaders.
  - Trains are running empty or at below maximum load capacity.
  - Too few consists - QR reluctant to invest in new trains until new mines come on and "take or pay" contracts are signed.
  - Bottlenecks exist at rail loops and coal unloading terminal.
- Large variability in coal loading efficiency
  - Some loaders result in sticky coal that delays loading and increases turn around time.
- Terminal capacity reduced
  - The terminal operator DBCT Pty Ltd declared *force majeure* in February 2004 over a relaimer that collapsed which resulted in a loss of 3Mt throughput.
  - 2004 terminal capacity was constrained to 95 per cent.

- Security of supply
  - The absence of rail i.e. ‘missing links’ - north of Goonyella to link mines to Abbots Point and/or south to Surat Basin to open up new mine developments.
  - Concerns over the security of the large tonnage going through one port on one rail line
- Port
  - Tidal constraints and vessel arrival and departure lane depths impact on berthing opportunies.
- Other supply chain impacts
  - Critical water shortages affect coal mines in the Northern Bowen Basin and are impeding mine expansion plans.
  - There is a lack of availability of skilled workers.
  - Large machinery parts have long delivery dates.

The following key areas of strategy are considered important:

1) *Promote greater supply chain responsiveness through regular, independent and transparent analysis and forecasting of developments affecting the export coal industry.*

2) a. *The development and operation of effective logistics / coordination groups in each of the major Australian coal export supply chains, along the lines of the system developed through the Hunter Valley Coal Chain Logistics Team.*

   b. *The objectives of these groups, which should have representatives of service providers (key decision makers) should be to:*

      i. *Improve consultation with infrastructure owners and operators;*
      ii. *Improve current total supply chain capacity performance, coordinate operations and maintenance, and plan transport operation expansions to meet future requirements, including through the application of advanced IT supply chain technologies; and*
      iii. *Prioritise and plan infrastructure development to meet future capacity requirements; and seek to maximise and coordinate infrastructure investment by each member of the supply chain including agreement on the best means of ensuring critical transport infrastructure funding meeting future demand.*

3) *Capacity Allocated Systems should only be used as a short term measure and applied in conjunction with conditions to ensure infrastructure capacity expansions occur.*

4) *Investment to increase the capacity of existing infrastructure and for future infrastructure expansion projects needs to be aligned with industry requirements and brought forward to take advantage of the strong export market and where eligible, be awarded Major Project Facilitation status.*

5) *Develop a national reform agenda for the rail and port sectors that integrates coal supply chain needs including through:*

   a. *consideration given to the development of a nationally coordinated framework as part of the COAG Review of National Competition Policy to ensure commercially negotiated outcomes for access to essential infrastructure;*

   b. *a regulatory regime that focuses on incentive mechanisms to promote optimal operation, use of, and investment in, essential infrastructure services.*

6) *Review regulatory approval processes with a view to ensuring the early resolution of consideration of proposals for infrastructure capacity development.*

   a. *Relevant Government jurisdictions should facilitate the fast tracking of regulatory processes for vital infrastructure investment when considering future major coal infrastructure investment developments including in the context of environmental and community based planning and approval processes.*

7) *Implement an international communications strategy to be undertaken by the Australian Government to ensure overseas markets are fully aware of measures being taken to address coal transport requirements and confirm Australia's status as a reliable supplier of coal.*

2. Coal Market Outlook and Hunter Valley Case Study

Strategy

Promote greater supply chain responsiveness through regular, independent and transparent analysis and forecasting of developments affecting the export coal industry.

Summary

Australian coal exports are expected to increase to $25 billion next financial year (2005/06) up from current levels of $16 billion and levels of less than $11 billion in 2003/04. This reflects large price increases on the back of strong world demand. Producers have been expanding production and have brought forward plans to invest $2.6 billion to develop 40Mtpa of new mine capacity by 2008. However, the ability to expand coal exports relies on the capacity of coal supply chains to handle the additional output from mines.

ABARE forecasts global coal trade to increase by 1.9 per cent a year for the period 2004-15, with the annual growth in metallurgical coal trade expected to average 2.7 per cent and thermal coal trade 1.6 per cent. Australian coal exports are forecast to increase by over 100Mtpa to reach 340Mt in 2015. If the Hunter Valley is not restricted by infrastructure constraints, coal exports are projected to grow at 2.8 per cent a year from 78Mt in 2003 to 122Mt in 2015. Exports in 2015 could be as high as 130Mt if exports from China remain constrained or as low as 112Mt if Japan imposes tight carbon constraints. ABARE's census of Hunter Valley coal producers reinforces these forecasts but also indicates the potential for large market related fluctuations. Producers indicated that they could produce up to 203Mt in 2015 if prices are very strong or cut back production to 103Mt for weak prices.

However, coal exports from the Hunter Valley already face capacity constraints and the development of additional infrastructure in the short term will not keep up with the potential expansion in export opportunities. Plans are in place to expand coal chain capacity to 102Mtpa over the next 2-3 years, but large investments either involving major expansion work at existing coal terminals at the port and/or the development of a third terminal are needed to take export capacity to 120Mtpa and beyond. The costs of expansions not occurring beyond current capacity (2005 coal chain) are substantial - involving $8.5 billion in lost export revenue, a reduction in Gross State Product for NSW of $8.6 billion, reduced royalties and 1,934 less direct jobs[2]. This compares with capital expenditure of approximately $1 billion to develop the additional coal supply chain capacity.

This analysis highlights the need for independent and transparent forecasts that can be used to match future infrastructure development plans to the expanding needs of coal producers. The costs of mismatches to industry and to the state and national economies are very high and long lasting. Coal producers, infrastructure service providers and Australian and State government planners need to work together in developing a common set of forecasts and surveys of industry requirements that can be used to coordinate industry development.

2.1 Importance of the Australian Coal Industry

Australia is the world's largest exporter of black coal and the 4th largest producer of coal behind China, the USA and India. Australia accounts for approximately 7 per cent of the world's black coal production, a third of world coal trade and over half of world coking coal trade.

[2] Refer to Diagram 6, Page 18

Coal plays a central role in the Australian economy, accounting for approximately 10 per cent of total export income and provides the primary fuel source for coal-fired power stations, which generate up to 85 per cent of all electricity produced in Australia. ABARE estimates Australian black coal production during 2003-04 was 286Mt, of which 77 per cent or 218Mt was exported overseas, generating $10.9 billion in export revenue for Australia. 2004-05 exports are forecast to exceed $16 billion.

Coal's contribution to Australia's balance of trade will expand further in the near term with the value of exports forecast to exceed $25 billion in 2005-06 on the back of large price increases and expansions in export volumes.

The Australian coal industry has over 100 privately owned coal mines located mainly in the coal exporting states of NSW and Queensland and employs over 21,000 people throughout Australia. Approximately 60 of these are open cut mines and around 50 are underground mines.

The four major global coal suppliers, BHP-Billiton, Rio Tinto (Coal and Allied and Pacific Coal), Xstrata Coal, and Anglo Coal have a significant presence in Australia accounting for around 90 per cent of Australian coal production. There are many smaller producers with over 50 companies marketing and exporting coal from their Australian mines. Japanese companies are major investors in Australian coal mines, for instance Mitsubishi has a strong alliance with BHP-Billiton, and Mitsui has alliances with Anglo Coal.

Government policies and economic reforms in the areas of workplace relations, competition policy, taxation and the removal of coal export controls have supported measures by the industry itself to improve its economic and environmental performance. Cost reductions and increased productivity - up by 70 per cent since 1996-97 - have underscored major advancements in the international competitiveness of the Australian coal industry. This is attracting major investments.

A survey conducted by ABARE in October 2004 of investment plans in the Australian coal industry identified 14 committed projects involving capital expenditure of $2.6 billion and representing new capacity of over 40Mt scheduled for completion by 2008. This is up from 10 projects valued at $1.8 billion identified in the same survey just six months earlier.

However, the ability to expand coal exports to meet world demand relies on the capacity of coal supply chains to handle the additional output from mines.

An integrated coal supply chain consists of a coal export terminal the land transport systems that connects it with the mines serviced by this terminal and the bulk carriers that take the coal from the port to the overseas customers. Australia's export coal industry is serviced by nine coal terminals. These are:

- Abbot Point, Far North Queensland;
- Hay Point and Dalrymple Bay at Mackay;
- RG Tanna and Barney Point at Gladstone;
- Fishermans Island at Brisbane;
- Kooragang Island and Carrington at Newcastle; and
- Port Kembla.

The ports of Newcastle, Hay Point and Gladstone are by far the major coal exporting ports in Australia and this report has focussed on the first two of these, although many of the issues covered are common to other coal supply chains and each chain has its own unique features.

Although coal supply chains are essentially linear in nature, transporting coal from individual mines to a coal export terminal, they involve major complexities associated with:

- managing large volumes;
- the number of mines with different operating parameters and commercial interests;
- the large range of customers with their own shipping requirements;
- underlying growth and restructuring within the industry;
- infrastructure service providers such as the rail track provider, freight service providers, terminal operator and port operator that are typically owned and operated independently of each other;
- the overlay of different commercial and regulatory arrangements, and public and private ownership/responsibility across different parts of the coal chain;
- the requirement to integrate decision making along the coal chain and its many operators to schedule day to day operations or to develop the system to meet changing and expanding requirements; and,
- additional complexities associated with handling different coals types and blending coals.

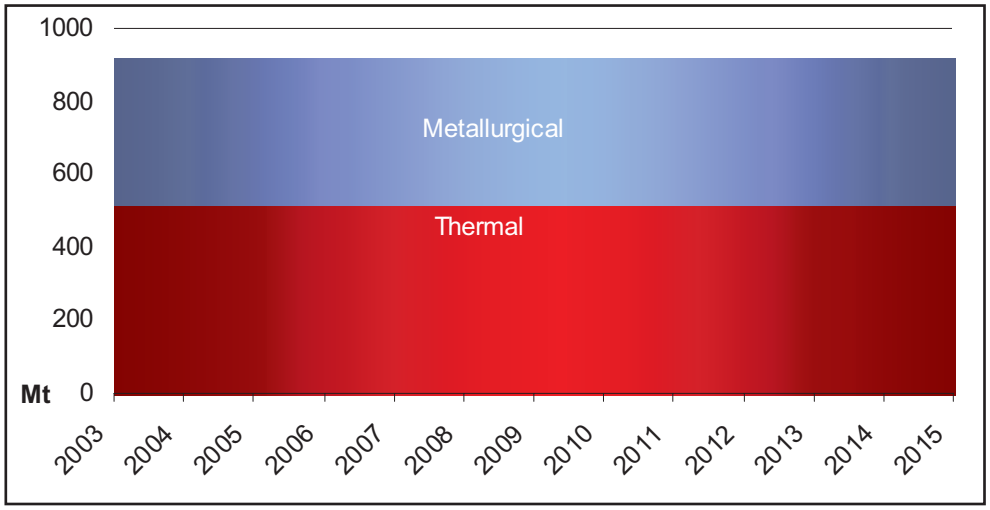
2.2 Global Demand

For the purpose of this report, the Australian Government Department of Industry, Tourism and Resources commissioned the Australian Bureau of Agriculture and Research Economics (ABARE) to undertake demand and supply forecasts for an outlook period to 2015. This study included a detailed case study and survey on the Hunter Valley coal supply chain. The full report *Infrastructure Issues in the Hunter Valley Coal Supply Chain* is at Appendix 5. Unless otherwise indicated the analysis in the rest of this Chapter draws on the findings of this report

Global coal trade is projected to increase at an average annual rate of 1.9 per cent over the period 2004 to 2015, to reach around 917 million tonnes. This compares with 742 million tonnes in 2004. Global coal trade is driven by demand in a number of key countries and regions, especially those in Asia which are projected to remain fairly stable at around 41 per cent of the traded market over the period 2004 to 2015. Coal importers moved away from long-term contracts and therefore investment in expanding mines and infrastructure slowed.

Stronger growth is expected in metallurgical coal trade over this period, which is projected to rise by 2.7 per cent a year, compared with 1.6 per cent a year for thermal coal (Diagram 1). However, thermal coal trade will maintain its dominant share of global coal trade, accounting for nearly 70 per cent over the

Diagram 1: Global coal trade outlook



Source: ABARE Report - *Infrastructure Issues in the Hunter Valley Coal Supply Chain, 2005*

period to 2015. Australian exports are expected to continue to expand to meet growing global demand with ABARE projecting exports to increase to around 340Mt by 2015.

It is acknowledged by ABARE in the supply/demand case study of the Hunter Valley, that there is a level of uncertainty regarding any medium to long term forecast for the international coal trade. Two key uncertainties with the potential to impact on future international demand are:

- The Kyoto Protocol coming into force and the potential impact of Japanese climate change policies on Japanese coal demand (Japan is currently the world's largest importer of both thermal and metallurgical coal); and
- Increased imports to China to meet growing domestic demand coupled with the possibility of reduction in exports of thermal coal from China, and Australian producers filling part of this shortfall.

2.3 Outlook for coal imports in key countries

Detailed analysis of coal imports in key countries is provided in Diagram 2 (thermal coal) and Diagram 3 (metallurgical coal).

Diagram 2: Outlook for world thermal coal imports - key markets

Country	Thermal Coal Imports
Japan	ABARE projects thermal coal imports to Japan to increase from 107Mt (2004) to 124Mt in 2015 at an average annual growth rate of 1.3 per cent. However it should be noted that the possible introduction of a carbon tax in Japan in an effort to meet their Kyoto Protocol emissions target may have a dampening effect in thermal coal imports . Coal currently accounts for around 25 per cent of power generation in Japan with an additional 6.5 gigawatts of coal fired capacity under construction or planned by 2015. With widespread closures of nuclear power generation capacity underpinning thermal coal import growth, Japan should remain the world's largest importer of thermal coal over the period to 2015.
Republic of Korea	Strong growth in thermal coal imports into the Republic of Korea is forecast in the medium term at an average annual rate of almost 5% to 2010 reaching an estimated 76Mt. This projected growth is underpinned by robust economic forecasts for South Korea and the expected development of additional coal fired generating capacity, taking coal's share of power generation in South Korea to 44% in 2010. Growth is expected to stabilise after 2010 however with the possibility of hydroelectricity and natural gas expanding their share of South Korea's energy mix by 2015.
Chinese Taipei	Imports of thermal coal into Chinese Taipei are forecast to increase from 50Mt in 2004 to an estimated 69Mt in 2015. This is matched by a predicted rise in coal's share in power generation from 44% to 49% in 2015.
Malaysia	According to ABARE , thermal coal imports into Malaysia are set to rise significantly to 29Mt in 2015, reflecting the Malaysian Governments' move to encourage development of coal fired plants to diversify domestic power generation mix. Approximately 8.5 gigawatts of new coal fired capacity is planned over the outlook period to 2015.
European Union (25 members)	A larger share of natural gas into the power generation fuel mix coupled with EU member countries aim to meet emission targets under the Kyoto Protocol may result in a marginal reduction of thermal coal imports. ABARE forecasts a decrease of 0.4% a year from 160Mt in 2004 to 154Mt in 2015.

Source: ABARE Report: *Infrastructure Issues in th Hunter Valley Coal Supply Chain, 2005*

Diagram 3: Outlook for world metallurgical coal imports - key markets

Country	Metallurgical Coal Imports
Japan	In 2004, Japan was the world's largest steel exporter, exporting 35.3 million tonnes of crude steel. Japan is expected to remain the world's largest importer of metallurgical coal over the medium term , although Japan's exports of crude steel are projected to slow as countries that have traditionally imported steel from Japan invest in new steel production capacity and reduce their overall import requirements. Imports of metallurgical coal is expected to remain r elatively flat at around 67 million tonnes in 2015.
China	China has increased its imports of hard coking coal for its rapidly expanding steel sector, with imports rising from 0.5 million tonnes in 2000 to 6.4 million tonnes in 2004. In the medium term, p lanned closure of inefficient blast furnaces, increasing use of PCI technologies and more efficient use of metallurgical coke in blast furnaces are also expected to moderate China's growth in demand for metallurgical coal. China's imports of metallurgical coal are projected to increase by 23 million tonnes to reach 29.5 million tonnes in 2015.
India	Over the period to 2015, India's imports of metallurgical coal, which is of superior quality compared with most Indian metallurgical coal, are projected to in crease at an average annual rate of 9 per cent to reach 35 million tonnes, compared with 14 million tonnes in 2004. Blast furnace steel production in India is forecast to grow by 4.9 per cent a year out to 2015 due to strong economic growth spurring inves tment in housing and transport infrastructure.
Brazil	Supported by significantly higher volumes of coke demand for its growing steel sector, Brazil's imports of metallurgical coal are projected to increase at an average annual rate of 6.5 per cent to re ach 36 million tonnes in 2015, compared with 18 million tonnes in 2004.

Source: ABARE Report: *Infrastructure Issues in th Hunter Valley Coal Supply Chain, 2005*

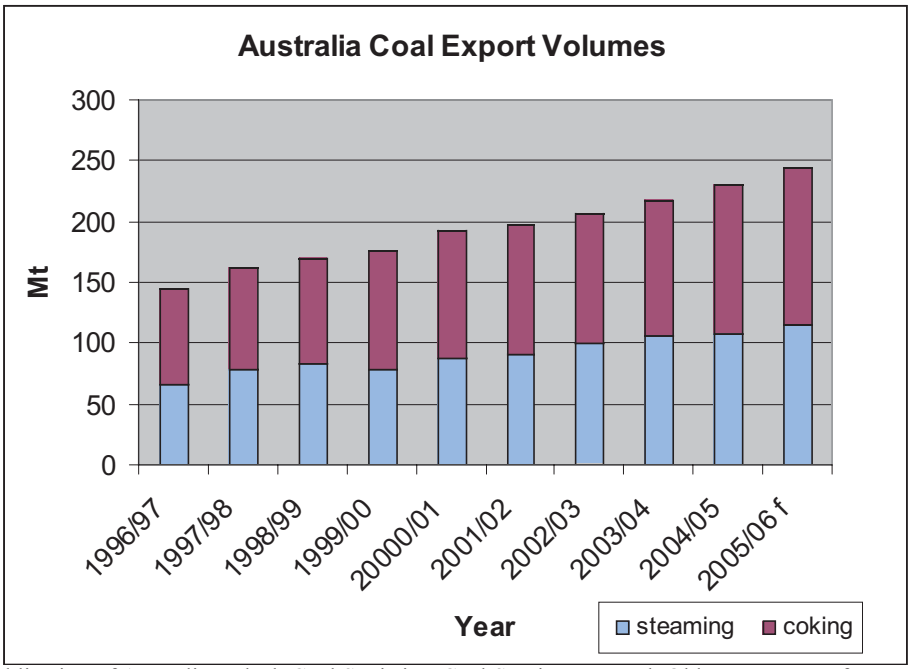
2.4 Australian coal exports

For the last few decades the world coal market has been characterised by excess supply with coal prices often being weak or depressed. This has had a flow on effect to customers who have increasingly reduced their reliance on long term coal supply agreements, expecting to be able to service their expanding needs on the open 'spot' market or through much shorter contracts.

It should be noted that despite weak market conditions, Australian coal production and exports have been increasing since the late 1990s on the back of productivity increases and improvements in Australia's international competitiveness.

Overall growth trends for international coal trade and Australian exports (Diagram 4) have been relatively steady over the last decade. In the 10 years between 1996/97 and 2005/06, coal exports will have increased by around 100Mt and are forecast to increase by a further 50Mt in the five years from 2005/06.

Diagram 4: Australia Coal Export Volumes



Source: A joint publication of Australian Black Coal Statistics, Coal Services Pty Ltd, Qld Department of Natural Resources, Mines and Energy

The outlook for coal imports will have a significant impact on potential demand projections for Australia.

2.5 ABARE Findings: Hunter Valley Survey

ABARE conducted a detailed survey of Hunter Valley coal producers and transport infrastructure providers to examine the following issues:

- Current and future demand for coal from the Hunter Valley;
- Ability of Hunter Valley coal producers to meet current and future demand for coal;
- Whether coal transport infrastructure is a constraint to Hunter Valley coal exports; and
- If infrastructure is a constraint to coal exports, what are the costs?

Below is a brief summary of the survey findings. The complete ABARE Report *'Infrastructure Issues in the Hunter Valley Coal Supply Chain'* is included in Appendix 5 to this report.

Demand for Hunter Valley Coal

For the purpose of this report ABARE developed a **base case** for potential demand for Hunter Valley coal forecasted out to 2015. Given the uncertainty in developing forecasts out to 2015, a number of assumptions were made:

- The level of demand is not influenced by the capacity of the Hunter Valley coal chain;
- Global coal trade will increase by 1.9 per cent per year over the period 2004-15 reaching an estimated 917Mt; and
- Demand for Australian coal will increase by 3.6 per cent per year out to period 2004-15 from 230Mt (2004) to an estimated 341Mt in 2015.

ABARE projects that potential demand for Hunter Valley coal exports will increase at an annual rate of 2.8 per cent a year from the current level of 78Mt to an estimated 122Mt in 2015, with the majority of this demand being thermal coal.

As noted previously in this Chapter, relative global demand forecasts for the medium and long term will be tempered by a range of uncertainties. These include possible dampening of demand from Japan as they seek to introduce carbon restraint measures to meet Kyoto targets or expanding export opportunities for Australia due to the possibility of decreasing exports from China.

Using the Japan scenario of a carbon restraint measure being introduced as a low coal demand bound to the above base case, and reduced exports by China as an upper coal demand bound, ***ABARE estimates that from a 2004 export level of approximately 78Mt, potential demand is forecast to be between 112 and 129Mt by the year 2015.***

Supply of Hunter Valley Coal

Using information collected through the detailed survey of Hunter Valley coal producers, ABARE has projected potential supply of coal to the year 2015. ABARE forecast that Hunter Valley coal producers could supply the following:

- Up to 103Mt in 2015 if the average price was US$20 per tonne, and
- Up to 203Mt by 2015 if the average price was US$50 per tonne.

Coal producers were also asked about potential brownfield/greenfield expansions or changes to their production profiles that would be needed to sustain production levels at the above prices. ABARE found that most developments had 'free on board' costs of between US$20 -US$30 per tonne. This suggests that

if demand were sufficient and prices were to remain within the mid-range US$35 per tonne and upper-range US$50 per tonne, Hunter Valley coal producers could potentially double existing production levels by 2015. In addition approximately two-thirds of expansion plans identified by producers would be realised at prices around US$35. This would bring total production to 130-140Mt.

Constraint to Coal Exports

There is a broad range of views among all supply chain stakeholders on the nature of constraints impacting on increasing exports from the Hunter Valley. These include, but are not limited to debate over specific concerns over short term problems associated with mine, rail and port infrastructure to, long term availability and access to Hunter Valley coal reserves.

While the ABARE report concludes that potential supply of coal from the Hunter Valley is unlikely to be a constraint in meeting the potential demand over the outlook period to 2015, there are a number of variables which need to be factored into the analysis, including:

- Appropriate market price;
- Production costs;
- Progress delays of brownfield expansions; and
- Unconstrained and timely access to infrastructure services.

In terms of constraints to export coal demand the relationship between coal chain infrastructure and ABARE's potential demand forecasts *suggests that at least in the short term the development of coal chain infrastructure is a constraint to Hunter Valley coal producers meeting potential demand.* This is based on estimated coal chain capacity in 2005 of 85Mtpa compared with a forecast for potential coal demand in the Hunter Valley in 2005 of 90Mtpa.

While the above indicates that further timely development of port and rail capacity will be necessary to meet potential coal export demand, it should be noted that there are a number of proposed developments in the Hunter Valley to address this issue, they include:

- proposed Australian Rail Track Corporation (ARTC) strategy to increase rail capacity to 140Mtpa by 2008 (will also need rolling stock invesment by rail operators);
- proposal to develop coal chain infrastructure to 120Mtpa by 2011 and subject to demand levels, to 150Mtpa before 2015; and
- possible development of a third coal loading terminal adjacent to the existing Kooragang coal terminal.

Costs of Infrastructure - Capacity Development Scenarios

To assess the issue of the likely size and timing of capacity increases required, ABARE used a base case scenario (as detailed earlier) and four infrastructure development scenarios (as detailed in Diagram 5).

Diagram 5: Capacity Development Scenarios

	Assumption	Estimated Cost
Base Case	Coal chain capacity able to meet ABARE base case unconstrained demand forecast; that is coal chain capacity reaches/exceeds 122Mt pa by 2015.	$900 million - $1 billion
Scenario 1	Coal chain capacity at existing leve 1 of 85Mtpa with no further developments past this point.	N/A
Scenario 2	Coal chain capacity increases t o 102Mtpa by 2008 with no further development past this point.	$200 - $300 million
Scenario 3	Assumes Scenario 2 - with additional development of coal chain capacity to 120Mt pa by 2011 via port developments at Kooragang coal terminal.	$700 - $900 million
Scenario 4	Assumes Scenario 2 – with additional development through new coal terminal raising coal chain capacity to 140Mtpa by 2009	$750 million - $1 billion

Source: ABARE Report: *Infrastructure Issues in the Hunter Valley Coal Supply Chain, 2005*

Impact on Gross State Product (GSP)

AUSTATE, the ABARE model of the Australian economy was used to project Gross State Product (GSP) in New South Wales, export revenue and employment for each of these scenarios and compared with the base case projection (Diagram 6).

ABARE's findings indicate that constraining the coal chain capacity over the outlook period for **Scenarios 1** and **2** will result in significant reductions in GSP and export revenues.

- By 2015 - accumulated **reduction in GSP** (net present value terms discounted at 7 per cent) is estimated at:
  - $8.6 billion (85Mtpa with no further development); and
  - $4.6 billion (capacity to 102Mtpa with no further development).

- Accumulated **reduction in export revenue** is estimated to be:
  - $8.5 billion (85Mtpa with no further development); and
  - $3.9 billion (capacity to 102Mtpa with no further development).

- Reflecting lower levels of coal output , possible **reduction in employment** in NSW coal sector:
  - 1934 people (85Mtpa with no further development); and
  - 1349 people (capacity to 102Mtpa with no further development).

ABARE has also examined accumulated difference in GSP and export revenue for **Scenarios 3** and **4** that focus on period to 2010, where shortfalls in infrastructure capacity prevent exporters from meeting demand.

Diagram 6: Impact on Gross State Product - Scenarios 1-4 Compared with Base Case

		2015	2015	2015	2015	2015
Scenarios		**Base case Unconstrained**	**Scenario 1**	**Scenario 2**	**Scenario 3**	**Scenario 4**
Gross state product	2004 A$m	401074	-1935	-1161	-90	0
-accumulated loss	2004 A$m	-	-8577	-4609	-1606	-1518
Coal output	2004 A$m	9466	-1566	-946	-105	0
Export revenue	2004 A$m	6694	-1885	-1000	-111	0
-accumulated loss	2004 A$m	-	-8526	-3889	-1347	-1225
Employment in NSW	persons	3386336	-4783	-3024	-322	-31
- coal	persons	9799	-1934	-1349	-164	0

Source: ABARE Report: *Infrastructure Issues in the Hunter Valley Coal Supply Chain, 2005*

ABARE examined the effects of one year delays in the development of:

- coal chain capacity to 120Mtpa through port developments at the Kooragang coal terminal by 2011, as well as
- a potential new coal terminal which would increase coal chain capacity to 140Mtpa by 2011.

The cost in GSP for NSW for a one year delay in these capacity expansions ranges from $392 million for delays in developing the existing Kooragang terminal and $291 million for delays in the development of a third coal terminal. The economic value of expanding PWCS' existing terminals beyond 102Mtpa is not clear at this stage, and a comprehensive cost analysis for expansion of the terminals is required.

As coal supply chains expand, diseconomies of scale may occur. There is speculation within the industry that the additional complexities associated with managing throughput levels of more than 80-90Mtpa may impose additional costs that will reduce the overall economic efficiency of the coal chain. The Hunter Valley Coal Chain is now operating at these levels with plans being considered to increase capacity beyond 120Mtpa. The Dalrymple Bay coal terminal has plans to expand to 90Mtpa, however the coal supply chain may need to be expanded even further to manage at least 130Mtpa if all mine expansions progress.

The development of coal transport infrastructure capacity is currently not keeping pace with the growth in exports. This appears to be related to a number of factors including significant and unexpected surge in demand for Australian coal, recovery of the international iron and steel market (the 20 year period from the mid 1970's to the late 1990's was a difficult time for the steel industry and consequently the demand for metallurgical coal was fairly flat), and the privatisation of aspects of Australia's public infrastructure.

In addition to this is the absence of a central information base that collects robust production supply forecasts and resultant demand for transport infrastructure capacity to enable each individual coal chain to better align supply chain provider requirements. Added to this complexity is the absence of agreed independent market forecast data upon which to progress strategic developments. There are many demand and supply forecasts currently being used by the coal industry and infrastructure providers. Each has different assumptions and risk profiles. While individual coal producers themselves have different risk profiles it would be valuable for domestic and international investors and policy makers to be able to access aggregated demand and supply forecasts that are developed by an independent body through an agreed framework.

Although various coal producers will undertake their own production forecasts and customer demand forecasts, commercial sensitivities will often mean that this information cannot be shared. A common information base including a forecasting mechanism developed by an independent analyst who has access to each company's forecasts would provide a useful starting point for all members in the coal chain. A number of Australian and State Government agencies either collect this information already or have the capacity to do so (i.e. ABARE, Australian Bureau of Statistics, relevant State Resource Departments). Other options may include using publicly available forecasts or to commission purpose built forecasts through independent consultants. This is an approach that works effectively in the Downstream Petroleum Industry. PWCS notes that 'The best signal to investors of the need for capacity expansions is the financial commitment of the coal producers to demand (ie take or pay arrangements) and reliable demand forecasts.'[3]

However, recent experience indicates that producers are not prepared to contract for additional infrastructure tonnage in advance of actual requirements. Consultation and cooperation between producers and infrastructure service providers aimed at developing agreed forecasts are needed to ensure the timely expansion of infrastructure services.

[3] PWCS submission to ACCC on their medium-term CBS, 9 May 2005

3. Australian Coal Supply Chains

Strategy

a. The development and operation of effective logistics / coordination groups in each of the major Australian coal export supply chains, along the lines of the system currently being developed through the Hunter Valley Coal Chain Logistics Team.

b. The objectives of these groups, which should have representatives of service providers (key decision makers) should be to:

i. Improve consultation with infrastructure owners and operators;
ii. Improve current total supply chain capacity performance, coordinate operations and maintenance, and plan transport operation expansions to meet future requirements, including through the application of advanced IT supply chain technologies; and
iii. Prioritise and plan infrastructure development to meet future capacity requirements; and seek to maximise and coordinate infrastructure investment by each member of the supply chain including agreement on the best means of ensuring critical transport infrastructure funding meeting future demand.

Summary

The efficient operation of coal supply chains requires logistics management that coordinates daily operations between all parties in the coal chain. However, each service provider typically designs its operations around its own requirements rather than the needs of the coal chain as a whole. The lack of coordination in scheduling coal movements between mines and loading on ships can constrain the coal chain and contribute to costly bottlenecks. These inefficiencies can impact significantly on coal chains that are running at or near full capacity.

The benefits in coordinating logistics management between all infrastructure service providers is reflected in the substantial improvements in performance and throughput that have been achieved by the Hunter Valley Coal Chain Logistics Team. These benefits are also reflected in the Hay Point Coal Terminal with BMA integrating the operations of its 100 per cent owned terminal and mines and aiming to match this with bulk carrier arrivals, in coordination with QR - the rail service provider. In comparison multi-user terminals require additional coordination between mine operators and service providers, such as in the Dalrymple Bay coal chain, to minimise the bottlenecks this chain is currently facing.

Recognising these benefits it is recommended that all major Australian coal chains establish whole of chain logistics teams to coordinate activities and optimise operations to maximise throughput. Logistical arrangements need to be designed around the needs of the industry. As such logistics teams should ensure that all producers are actively engaged, either directly or indirectly through appropriate forums.

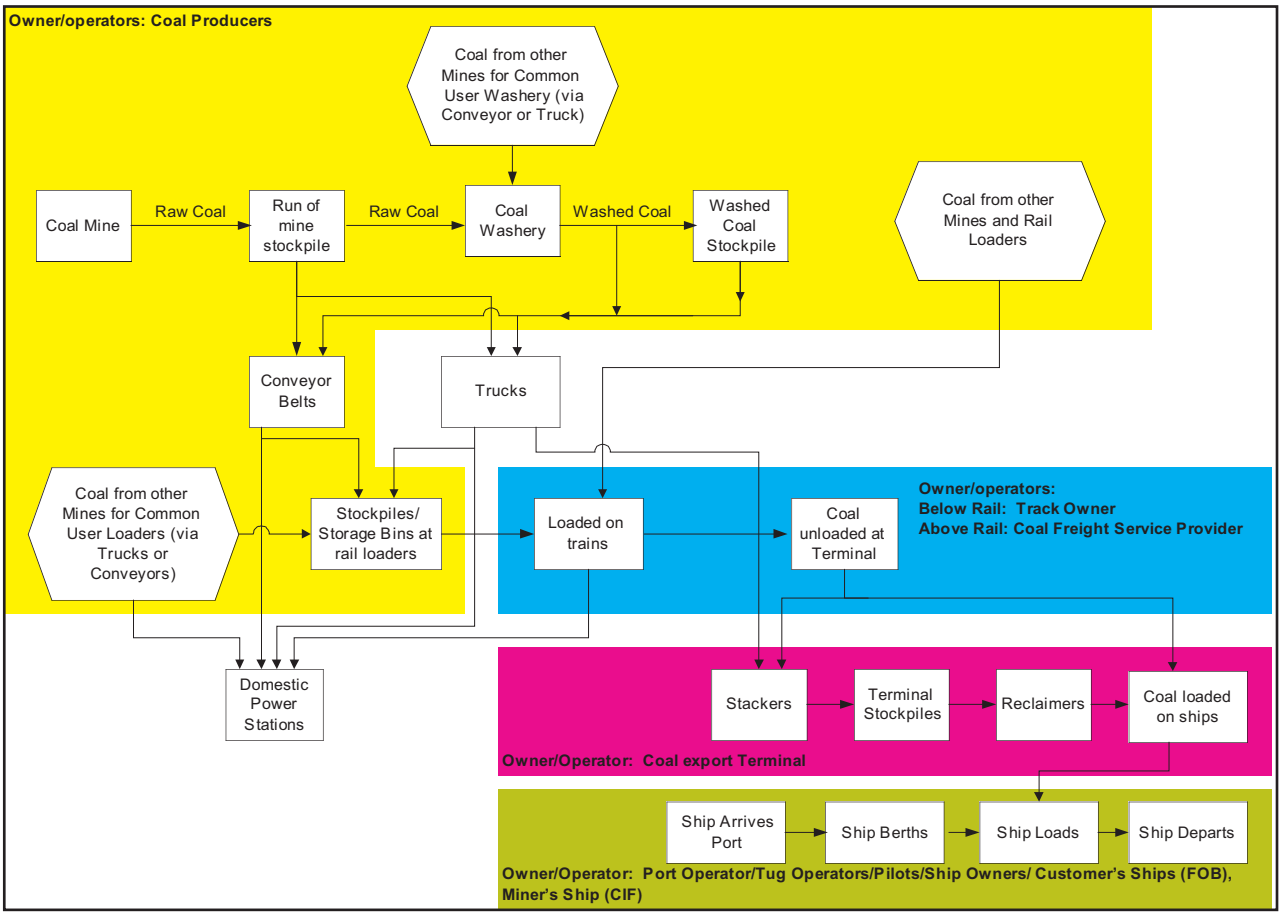
Logistics teams can also make valuable contributions to the formulation and coordinated implementation of plans to expand coal chain capacity.

There is increasing concern that coal chains are beginning to exceed their optimum size and that diseconomies of scale will emerge. In expanding capacity, the industry must develop and implement innovative technologies and systems. Computerised logistics management is needed to manage the huge number of decisions that are needed to optimise the day to day performance of the coal chain. The Hunter Valley Coal Chain Logistics Team is currently developing a computerised system. Other Australian coal chains will need to follow this integrated chain approach to ensure more effective utilisation of information technology.

3.1 Description - Coal Supply Chain

The coal industry faces a complex transport chain (Diagram 7) encompassing: mine site loading, inland rail and road transport, shore based handling, in port services and marine transport.

Diagram 7: Generic Coal Supply Chain



Source: Department of Industry, Tourism & Resources

Transport of coal is a significant cost item and in some cases the cost of rail transport and port handling charges can be double the cost of mining. Potential disruptions and bottlenecks may not only impact on the reliability of the coal transport chain it can also result in higher costs such as demurrage charges.

Each section of a coal chain is typically owned and operated by different entities, making it essential for integration of the logistics and planning of the entire coal supply chain. The two largest coal export ports - Newcastle (Kooragang Coal Terminal and Carrington Coal Terminal) and Hay Point (DBCT and BMA) - and rail networks servicing the ports have very different ownership and operating structures, which has impacted on the opportunity for integration and logistical coordination of the whole coal supply chain. While similar physical constraints can be experienced along individual coal chains, each coal chain is also unique in its geography, topography, capacity and number of existing and potential users.

Four broad coal supply chain infrastructure models were observed in NSW and Queensland:

- A coal producer owned and operated vertically integrated system as seen at BMA's Hay Point terminal (and akin to the operation of the Pilbarra iron ore logistics chains).
- Industry consortium owned and operated systems such as Newcastle, and Port Kembla
- Publicly owned and operated systems such as at Gladstone and Brisbane. Abbot Point is a subset of this with operations contracted out to a coal producer.
- A privately leased and operated system such as Dalrymple Bay.

Vertically integrated coal supply chains, by their nature, have internal communication systems from mine to port which provide for efficient scheduling and investment decisions. Generally, regulated access arrangements are not required given that third parties are not using the system.

All other systems require communication between owners, operators and users of the infrastructure. Communication can be facilitated where industry consortiums own and operate the infrastructure. Access to infrastructure needs to be established in these supply chains to provide the terms and conditions on which an owner undertakes to provide access to the service. These arrangements can be negotiated commercially or regulated.

Greater complexity exists when a party independent of the coal industry is involved in the ownership or operation of coal supply chains. In these cases the potentially competing commercial interests necessitate enhanced communication amongst all parties.

Information on the NSW and Queensland coal industry and specific coal supply chains are detailed in Appendix 1. Proposed expansions of NSW and QLD coal supply chains and identified investment projects to increase coal chain capacity are detailed in Chapter 5.

3.2 Coal Chain Logistics Teams

Managing coal chain logistics is a major challenge given the relatively large number of players involved; all having different priorities and commercial interests. Competing interests can to some extent be accommodated when there is spare capacity in the system although at a potential cost to overall whole of chain productivity. When the coal chain is operating at near or full capacity, all users need to build on their common interests to address bottlenecks and to maximise throughput to enable the industry to grow.

Given the uniqueness of each coal supply chain, those operating within the coal chain itself are best placed to identify and address problems and work together to develop and agree on appropriate measures to maximise capacity along the chain. Even when communication and integration of coal chains occurs there is often disagreement on the actual cause(s) of bottlenecks or how they should be addressed. It is considerably more difficult for those operating outside the coal chain to identify causes or to adjudicate on possible solutions.

There is a real need to develop "whole of chain" logistical coordination teams that involve all participants in the coal chain and draws on their expertise.

It is imperative that all coal supply chain stakeholders are involved in the operational decision making to maximise throughput and planning. But this requires a real commitment to the whole of chain approach and leadership to achieve this outcome.

The Hunter Valley Coal Chain Logistics Team (see text box), is evidence of the benefits of this approach. Whilst also identifying and developing longer term capacity expansion plans for the Hunter Valley, the logistics team has been successful in improving the efficiency of operations to allow increased tonnages that can be handled by the Hunter Valley coal chain using currently available infrastructure.

The range of measures is broad and even includes some that may incur additional costs such as increasing the power to weight ratio in train configurations to reduce haulage times, or discouraging larger capesized vessels from being scheduled. However, improvements in the scheduling of trains, reductions in train cycling times and the better coordination between coal deliveries and ship schedules have contributed to improvements in efficiency.

Discussions with various participants in the Hunter Valley coal chain have highlighted and confirmed the benefits of coordinating operations along the coal supply chain.

In late 2004 the DBCT Users Group (owned by a consortium of producers) – chaired by Anglo Coal and including Rio Tinto, Xstrata Coal, Peabody Coal, BMA, Macarthur and Foxleigh – and logistics providers QR, QR Network Access, Prime Infrastructure and DBCT Pty Ltd (terminal operator) established a Goonyella Coal Chain Improvement Program. An independent consulting firm, led by a Steering Committee of industry stakeholders are looking to establish a common understanding of the Goonyella Coal Chain and initiate both short and medium term efficiency initiatives to streamline and optimise coal chain efficiency and throughput. This program is half way through and due to cease in June 2005. It is thought to be a possibly precursor to a coordinated logistics team.

Case Study - The Hunter Valley Coal Chain Logistics Team

The Hunter Valley Coal Chain Logistics Team (HVCCLT) was established as a formal independent entity to provide planning and logistical services to all its members consistent with the System Rules. Membership of the Hunter Valley Coal Chain Logistics Team is open to all infrastructure owners and operators servicing the coal industry in the Hunter Valley.

The HVCCLT combines the previously separate coal chain planning functions of the various organisations it represents. It is tasked with developing plans, managing systems and looking at opportunities to maximise coal chain throughput to the Port of Newcastle through the efficient planning of coal movement along the coal chain from load points to vessels, as well as identifying and accelerating expansions in infrastructure capacity [4].

The structure of HVCCLT was formalised at the beginning of 2004, under a memorandum of intent that provides a single independent coal chain planning system organised by a team that is able to make its own plans under one manager and that has the responsibility to act in the interest of the entire transport coal chain. It has its own budget and non-employee costs are currently funded 50:50 by Port Waratah Coal Services (PWCS) and Pacific National.

The HVCCLT runs the daily operation of the Hunter Valley coal chain and responds as one manager who has responsibility to act in the interest of the entire coal chain to improve transport chain efficiency through improved scheduling practices, optimising the rail network and maximising stockpiles and throughput at the export ports. The Team is guided by one representative from each of the following organisations: Pacific National; PWCS; Rail Corp; Queensland Rail (QR); ARTC; and the Newcastle Port Corporation.

HVCCLT developed an Integrated Planning System which looks at the whole coal chain and presents all known constraints to deliver one common coal chain plan to all participants. Different parts of the chain have had to accept that their assets will be controlled for the good of the whole chain.

An initial short term - four year capacity plan - strategy focused on:

- Increasing load point capacity and performance
- Increasing vessel management planning and scheduling
- Kooragang process improvement – rail receival and ship loading capacity.
- Improving live run performance
- Accelerating major rail infrastructure upgrades.

Users (who ultimately directly contribute to and/or underwrite cost of improvements to a bulk commodity facility) are able to input to logistics decision making through the Capacity Management Forum, the Industry Reference Group and the Rules Committee. However, the absence of direct membership by the coal industry is seen by some coal producers to result in users of the infrastructure having limited input on the day to day operations and future planning of coal chain capacity.

While coal producers do not own the transport infrastructure assets that the logistics team manages, users and operators have complementary interests in maximising throughput.

Nevertheless, there is a view by service providers that excluding the coal producers from having direct membership on the logistics team ensures an appropriate level of independence and 'operating for the common good of the Hunter Valley Coal Industry'.

The Hunter Valley Coal Chain Logistics Team is developing computerised systems that will provide a better understanding of how to optimise the overall performance of the coal chain, automate the day to day scheduling tasks and help plan expansions in the coal supply chain.

Automated systems will become increasingly important in handling the multitude of day to day decisions which need to keep pace with capacity expansions. It could well be that such systems will play a vital role in redressing the diseconomies that anecdotal evidence suggests may occur when coal chains exceed 80-90Mtpa. They also will play an important role in identifying solutions that are not necessarily intuitive.

[4] PWCS applications for authorisation of a Medium Term Capacity Distribution System, ACCC 2004

Using Logistics Teams to Coordinate Expansions in the Coal Supply Chains

It is acknowledged that the participants within each coal chain are best placed to work through key issues identified in this report and to develop appropriate response strategies. In developing these strategies there are a number of common issues that could be addressed under the workplan of a coal chain logistical and coordination group. The following includes a list of key issues that could be considered by logistics teams in reviewing the operating arrangements for the coal chain, especially when the chain is operating at full capacity, and to enable the development of effective and timely capacity expansion plans to achieve an overall improvement in system capacity:

- Identify the weakest points within the coal chain (ie those services that are operating at full capacity and which may be the ultimate cause of any bottlenecks) and consider what measures can be taken to lift their performance to better match that of the rest of the supply chain,
- Identify problems and difficulties within the coal chain that can cause disruptions to the efficient operation of the system as a whole and develop measures to address,
- Identify operational measures that can be used to reduce delays and bottlenecks when the coal chain is running at maximum capacity,
- Identify impediments to improving operations and scheduling,
- Develop short and long term measures to increase throughput of existing infrastructure until new capacity can be developed (eg scheduling, revising operating arrangements, changing train configurations, etc),
- Identify any smaller expansions (eg. better work practices) in capacity ahead of major capital expansions.

Technology to Improve Logistics Management

In addition to simply expanding infrastructure capacity, coal supply chain participants must work smarter to develop and implement innovative technologies and systems to maximise coal supply chain throughput. This may involve the development of new terminal facilities (which in some cases can involve a lower capital cost per unit of capacity than can be achieved by expanding existing terminals) or even the development of alternative coal chains to take pressure off existing coal chains. For instance, the Queensland Government announced on 23 March 2005 a feasibility study to develop the missing link between the Goonyella and Newlands rail networks and expanding capacity at the Abbot Point coal terminal.

Manual logistics management appears to be a significant factor in achieving greater economies from higher throughput. The industry will need to invest more heavily in computerised logistics management in order to optimise the performance of large coal chains. Computer controlled rail scheduling and coal stacking and reclaiming at Port Waratah can accommodate some 150 different export coal blends. As previously stated (see box over page), the Hunter Valley Coal Chain Logistics Team is currently developing a computerised system to manage logistics. This system will be progressively implemented over the first nine to ten months of 2005. Other coal chain logistics teams should monitor these developments with a view to adapting and applying similar electronic systems to their logistics management. There is also the potential to learn from computerised logistics management systems developed in other freight transport systems in Australia and worldwide.

Computerised logistics management, in addition to managing expansions in throughput, will also be needed to manage additional complexities, including the multiple rail freight service providers and additional coal terminals. The benefits of competition from multiple rail freight providers can be lost without improvement in logistics management.

It is also important to ensure that there are no impediments to the utilisation of labour saving technology, rather than relying on inefficient, out of date manual approaches.

We are seeing the emergence of consulting companies offering integrated transport coordination services for coal supply chains. These one-stop-shops adopt a whole of corridor approach to managing coal production, stockpiling, rail transport and shipping. These companies aim to provide central coordination services to allow mining operations to concentrate on coal production. This service would be valuable for smaller coal producing operations.

4. Capacity Allocation Systems

Strategy

Capacity Allocated Systems should only be used as a short term measure and applied in conjunction with conditions to ensure infrastructure capacity expansions occur.

Summary of Chapter 4

Capacity allocation systems are a short term measure that should only be applied in conjunction with a range of other measures to improve the overall performance of the coal chain. The capacity distribution system that operated in the Hunter Valley coal chain in 2004, in combination with other measures to improve shipping schedules, helped reduce queues and demurrage costs. However, the overall benefits were diminished by the unanticipated underutilisation of infrastructure capacity along the entire chain.

The rigidness of capacity allocation systems can also impose significant additional costs on the industry by reducing its responsiveness to industry developments and changes in market conditions. Greater flexibility was introduced into the medium term Capacity Balancing System that commenced at the beginning of 2005 to address problems with unused capacity and shipping allocations. These measures may not be sufficient to ensure the coal chain realises its full potential. They also do not remove the risk of market distortions and structural effects that may reduce the long term competitiveness of the Hunter Valley coal chain.

It is recognised that the Hunter Valley coal chain will continue to face constraints over the medium term and that from time to time the operators of the coal chain could face long vessel queues. Although the Capacity Balancing System has been approved by the ACCC for the period 2005-2007, the Hunter Valley Coal Supply Chain should consider designing a system that gives greater consideration to realising the full export potential of the coal chain. Less emphasis needs to be placed on avoiding queues in favour of managing and reducing the financial and reputational cost of queues. Such measures should be able to take advantage of ongoing capacity enhancement programs in the coal chain which should give operators greater flexibility in managing capacity constraints and shipping queues.

4.1 Overview of Capacity Allocation Systems

Capacity allocation systems which allocate the available coal supply chain capacity as shipping quotas (or shipping allocations) among exporters have been used in the Hunter Valley coal chain to help address bottlenecks resulting in large shipping queues off Newcastle. The Capacity Distribution System (CDS)[5] operated in 2004 and the Australian Competition and Consumer Commission (ACCC) has given final authorisation for a medium term Capacity Balancing System (CBS) which commenced at the beginning of 2005 to run until the end of 2007. PWCS sought to have the CBS extend through to the end of 2008 (a period of 4 years)[6]. A capacity allocation scheme has been formally proposed by Dalrymple Bay Coal Terminal (DBCT) Management and submitted to the ACCC. This system is designed to help manage the large shipping queues at DBCT. The ACCC can 'authorise' businesses to operate these schemes, which could otherwise be considered anti-competitive conduct, where it is satisfied that the public benefit out-weighs any public detriment.

[5] The ACCC also authorised the Capacity Allocation System to operate in 1997/98 subject to various triggers most notably associated with the size of the shipping queue.

[6] PWCS 9 March 2005 submission to ACCC.

The net public benefits identified by the ACCC primarily relate to the large savings in demurrage costs. In approving the 2004 CDS, the ACCC considered that these benefits outweighed the public detriment that may result from any:

- reduction in aggregate exports due to under use of allocation; and
- efficiency losses associated with increasing the amount of coal exported by high cost producers at the expense of more efficient low cost producers.

Capacity allocation systems can be useful to bring order back into the system while a range of short and medium to longer term measures to improve and expand coal supply chain capacity are developed and implemented. However they are not a stand alone measure and can be counter productive if measures are not implemented to improve the coordination of coal deliveries with the arrival and loading of coal ships. For instance, flexibility in contracts between producers and customers can result in the bunching of customer delivery requirements, which may lead to the bunching of ship arrivals as was observed at the Port of Newcastle in late February 2005.

Capacity allocation systems are also not a long term solution. This is a reflection that capacity allocation systems do not provide the flexibility that is needed to respond appropriately to underlying changes in the market and to differences in the operational make-up of different players. These are real issues of concern in the Australian export coal industry especially given its strong underlying growth, the large number of players involved and the need to be responsive to changes in the international market.

The Senior Officials Group reviewed the performance of the CDS in 2004 to see what, if any lessons need to be considered in determining the role and application of capacity allocations schemes in managing coal chain infrastructure constraints.

The findings of the Group indicate that the CDS made an important contribution to managing capacity constraints in 2004 but that its overall benefits were diminished by the unanticipated underutilisation of capacity. There were also indications of market distortions with the CDS contributing to changes in market behaviour and the attitudes of coal customers.

The industry is aware of these issues and has incorporated design features into the medium term CBS that aim to address problems associated with unused capacity and unused shipping allocations under the CDS in 2004. The Senior Officials Group consider that the CBS is a major improvement when compared to the CDS of 2004, however the Group considers that structural changes and market distortions may become more pronounced the longer the CBS remains in place.

There are also mounting concerns, including by some of Australia's international customers that the continued operation of the CBS is taking pressure off infrastructure service providers to invest in new capacity.

All participants in the Hunter Valley coal chain recognise that unconstrained coal throughput will exceed the capacity of the coal chain until substantial new capacity can be brought on line over the next two to three years. The range of measures being introduced in the near term will add some additional capacity and enhance the ability of the coal chain to coordinate coal deliveries with ship loadings. These include ongoing expansions and the refinement of operating procedures such as increasing rail speeds to 80 km/hr on the Minimbah Bank (which is estimated to increase track capacity to 90Mtpa by September 2005), the start up of coal rail freight operations by Queensland Rail in mid-2005 and the computerisation of coal chain logistics management.

The Hunter Valley coal chain will continue to face constraints over the medium term and from time to time the operators of the coal chain could face long vessel queues. As part of the phasing out of the CBS, stakeholders in the Hunter Valley Coal Supply Chain could consider designing a system that can be triggered as required to address queues that cannot be dealt with effectively by using other mechanisms.

This is preferable to a system which is designed on the basis of avoiding bottlenecks at the risk of losing potential exports.

Some of the key issues relating to the use of Capacity Allocation Systems include:

- The costs associated with market distortions and structural impacts, together with the risks of incurring additional costs associated with under performance of the coal chain will increase the longer capacity allocation systems remain in place. Over time these costs may well exceed public benefits from reductions in demurrage,
- It is noted that over the course of 2005 and early 2006 a number of Hunter Valley coal chain capacity enhancements are planned. These developments should provide greater flexibility to system operators to improve scheduling and logistics management, and could reduce the need to maintain an ongoing capacity allocation system,
- The combination of the CDS and improvements in coal chain logistics management in 2004 reduced large shipping queues resulting in savings in demurrage costs of $US80-140 million,
- Over half of all Hunter Valley coal producers (ABARE survey) considered that the CDS had a negative impact on their operations, and 67 per cent considered it had a negative impact on customers. Major customers indicated that the quota system impacts on their perceptions of the Hunter Valley as a reliable long term coal supplier. It is acknowledged that prior to the system being put into place there were similar complaints from major customer countries. This underlines the importance of developing a long run solution,
- During 2004 when the CDS was in place, the production plans of most producers reflected their shipping allocations and they were not able to take advantage of production shortfalls by other producers. Total throughput was only 77.8Mtpa compared with allocated capacity of 81Mtpa - at coal prices of $US40 per tonne this reflects a loss in export revenue of around $US130 million,
- Producers responded to pro-rata reductions in allocations by cutting coal sold on the spot market or on-supplied to coal traders. Market distortions, including changes in the structure of Hunter Valley coal operations, impacts on the responsiveness and competitiveness of Hunter Valley coal producers and the potential to use allocations to manipulate market outcomes, are expected to become greater the longer capacity allocation schemes remain in place,
- Given the high cost of lost potential exports, capacity allocation systems should err on the side of over allocating capacity. The design features of the medium term capacity balancing system (CBS) go some way towards reducing these risks - but may need to go further even if this means reducing the effectiveness of the scheme in preventing bottlenecks (eg. 10 per cent over allocation),
- There are mounting concerns that the CBS may be reducing pressure on infrastructure service providers to bring forward necessary expansions.

4.2 Review of Capacity Distribution System (CDS) in 2004

Reports submitted to the ACCC by PWCS and the findings of the ACCC in considering applications to CDS authorisations, detail the significant savings in demurrage costs associated with measures introduced by PWCS and the Hunter Valley Coal Chain Logistics Team (HVCCLT) to reduce shipping queues. The ACCC estimates likely demurrage savings of between $US80 million and $US140 million in 2004 and considers PWCS' estimate of demurrage savings of $US163million in 2005 to be reasonable[7].

The rulings of the ACCC are based on its assessment of public benefits and costs of schemes presented to consideration. The ACCC's jurisdictional powers to add value to schemes put forward for authorisation are limited - this is an upfront task for the Hunter Valley coal chain itself to undertake.

[7] Draft Determination of 16 Dec 2004 Authorising the Medium-term Capacity Balancing System, paras 7.80 - 7.87

The CDS in 2004 was designed to bring forecast aggregate shipping plans of the producers down from 88Mtpa to 80Mtpa - the handling capacity of the coal chain as identified by PWCS in its submissions to the ACCC[8] primarily - to minimise the costs of demurrage that were being unecessarily incurred by producers. Estimates of system capacity varied with some industry players of the view that the rail system could accommodate up to 84-85Mtpa. This was reflected in part by declared capacity being lifted to 81Mtpa in the second half of 2004. In its final determination of the CDS, the ACCC considered that 81Mtpa may prove to be an underestimate and that as a best case scenario there could be another incremental increase in capacity which could result in a capacity of 82Mtpa for the remainder of 2004.

Shipping forecasts were based on shipment plans provided by producers in August 2003. These forecasts incorporated cuts in production that were being contemplated by some producers in response to uncertain market conditions at that time. The improvement in market conditions and prices early in 2004 would have seen many producers wanting to draw on spare production capacity to expand output. However, production plans in aggregate were revised downwards to reflect shipping allocations.

Total shipments out of Newcastle in 2004 were only 77.78Mtpa, some 3.22Mtpa less than the 81Mtpa declared carrying capacity of the coal chain. This 3.22Mtpa of unused capacity represents a permanent loss in export revenue of around $US130 million (at prices of $US40 per tonne). This figure does not take account of the costs of production. In terms of overall industry profitability, the direct savings associated with a reduction in demurrage costs would have outweighed the loss of coal export revenues associated with not shipping the full tonnages available under the coal chains declared capacity of 81Mtpa.

The potential loss in export revenue was relatively greater in the second half of 2004 with actual shipments being 38.18Mtpa or 2.3Mtpa less than the 81Mtpa declared handling capacity - a half year loss in export revenue of approximately $US90 million.

Shipping allocations available in the second half of the year were 43.74Mtpa reflecting the increase in declared capacity, tonnages carried forward under each producer's tolerance of plus or minus 90,000 tonnes per quarter and large producers receiving less of their pro rata allocation in the first half of the year. Unused allocations in the second half of the year were 5.56Mtpa.

The unused capacity in 2004 illustrates a major problem with capacity allocation systems. This experience illustrates the potential for production disruptions and what this means in terms of lost exports if the operation of the capacity allocation system constrains other producers from taking up this unused capacity.

Once production plans are set to reflect shipping allocations, the ability of producers to expand output to take advantage of production shortfalls by other producers is often limited. Even if there are no barriers to the redistribution of unused shipping allocations, producers may not be able to adjust production plans quickly to respond to these new opportunities. This experience demonstrates the risks and high costs associated with having a rigid system in place that is not responsive to other industry and market developments - even in the very short term.

There were also possible losses in export revenue in not realising the coal chain's potential capacity - as opposed to the regulated or declared capacity. Some submissions to the ACCC considered that infrastructure service providers would have responded to the pressure of higher throughout levels by finding ways to make more effective use of existing facilities to achieve higher operating rates. The increase in coal rail operating rates early in 2004 provides some evidence of this potential. Even without this pressure, many industry players considered that the coal chain had the potential to carry as much as 82-84Mtpa. The possible loss in export revenue in not realising this potential capacity compared with actual shipments is estimated (at prices of $US40 per tonne) to be $US170-250 million.

8 ACCC Determination 9 July 2004, pg51, para 7.100-7.101

The operation of the CDS in 2004 also provides a clear indication of market distortions that can be attributed to the operation of capacity allocation systems.

Coal producers applied the cuts in their allocations by reducing the coal that they sold on the spot market or on sold to coal traders. Although there are major benefits to producers in supplying coal under long term contracts, they still need to be responsive to the needs of customers. The Hunter Valley relies very heavily on the Japanese thermal coal market and Japanese coal customers seek to source around 30% of their requirements from the spot market. They will ultimately source their spot market requirements from other producers if they cannot obtain it from the Hunter Valley.

The ABARE census of Hunter Valley coal producers and interviews with some major Japanese customers reinforce these findings. For instance:

- 67 per cent of coal producers indicated that the CDS had a negative impact on their relationships with clients. These companies considered that quota restrictions on exports reduced the reliability of Hunter Valley coal producers. It is still uncertain how this may affect the Hunter Valley as a coal producing region in the long term. Producers who considered the CDS had a positive effect on clients (13 per cent) believe that the CDS has introduced a more efficient and predictable system that allows consumers to plan vessel departures and arrivals more accurately than was previously possible.

- Key Japanese coal consumer groups considered that the CDS had a negative impact on their perception of the Hunter Valley as a reliable coal supplier and that the quarterly quota system did not allow supplies of coal from the Hunter Valley to match their preferred demand schedule. They indicated that as a result of the CDS they had actively sought coal from sources outside the Hunter Valley and would continue to do so while ever the effects of the CDS remained (note that the CDS is no longer in force).

The ABARE analysis also points to changes in customer's reliance on the Hunter Valley in meeting peaks in seasonal demand. The Hunter Valley potentially missed out on these market opportunities.

Allocations are based on producer forecasts. They reflect market shares at one point in time and there is the potential for multi-year systems not to give full account to competitive differences between producers. These distortions will become more significant the longer the system remains in place. Capacity allocation systems have the potential to constrain the advantages that lower cost producers have over higher cost producers in winning market share. These possible distortions are reflected to some extent in the ABARE survey results which found that over half of the Hunter Valley coal producers (53 per cent) believed that the CDS has had a negative impact on their business. These producers believe that:

- the quota system has prevented them from exporting more coal at a time of high demand and prices; and,
- a number of companies also commented on the potential impact of the CDS on existing and future production expansion plans.

Those producers who indicated that the CDS has had a positive impact on their operations (27 per cent) cited the saving in demurrage costs and security of access to capacity as having more than offset the disadvantages of the CDS.

4.3 Medium Term Capacity Balancing System (CBS)

The medium term Capacity Balancing System (CBS) which applied from the beginning of 2005 incorporates design features to take account of lessons learned in 2004 in relation to unused infrastructure handling capacity. The main design features of the CBS[9] are:

- The system is reviewed in September of each year and will only be maintained if annual requirements exceed capacity by three million tonnes and the majority of producers support its continuation,
- Allocations are made on a quarterly basis reflecting producer's own quarterly breakdowns of annual shipping plans,
- There are incentives and penalties to encourage the redistribution of shipping allocations that are unlikely to be used in a quarter (eg final allocation is subject to a take or pay contract at PWCS - $2.70 per tonne, an equivalent volume of unused tonnes will be deducted from loading allocations for the next quarter, possible penalties of $20 per tonne for unused allocations),
- Flexibility - producers can exceed quarterly allocation by up to 30,000 tonnes; carry forward 150,000 tonnes to the next quarter; ten day overlap between quarters,
- At the start of the year, each producer receives an additional allocation for each quarter - called a conditional allocation - equal to 5 per cent of their quarterly allocation. This allocation will not be available if vessel queue exceeds an average of 25 ships over a three week period and is only reinstated if the average queues falls below 15 ships over three week period. The conditional allocation is credited to a producer before useage of its upper flexibility allowance, but may only becomes available to use after a producer has used all its quarterly allocation and upper flexibility limits,
- Capacity is declared on an annual basis but there is provision to revise capacity and adjust pro rata allocations throughout the year, and
- Annual allocation auction in which participating producers may increase or decrease their allocations.

PWCS is seeking authorisation from the ACCC to extend this scheme through to the end of 2008[10]. The Senior Officials Group is concerned about the new proposed timeframe given the increased potential over time for market distortions and structural changes that may reduce the overall competitiveness and responsiveness of the Hunter Valley coal industry.

The various potential impacts that the CBS will have on different producers will become more pronounced the longer it remains in force. The industry is characterised by strong underlying growth. There is real concern that the CBS will become entrenched which may delay investment decisions that may impact on the longer term structure of the Hunter Valley coal industry. Hunter Valley coal producers face strong competition (for both market share and investment dollars) from other Australian producers and from other countries. They need the flexibility to respond to market opportunities and challenges which may not be afforded to them under an entrenched capacity allocation system. The design features of the CBS do not address potential market distortions and structural impacts on the industry, even though there is an intention by PWCS to run the system for four years.

There are also concerns that the operation of the CBS over this period could mask where capacity constraints are in the coal chain and reduce market signals to invest in additional infrastructure capacity. There are ongoing improvements in the coal chain which are enhancing and expanding capacity. The CBS does not allow these improvements to be fully tested and/or allow the verification of where constraints are in the coal chain. Whilst the various infrastructure service providers can point to untested constraints elsewhere in the system, or do not have the market pressure of addressing actual bottlenecks, there is the potential for them to delay investment decisions.

[9] PWCS Submission to ACCC on Proposed Medium Term Capacity Balancing System, Attachment I, October 2004

[10] PWCS submission 9 March 2005 to ACCC

The flexibility provisions, measures to enhance the redistribution of unused allocations and the conditional allocations make a valuable contribution towards reducing the risk of unused capacity. However, submissions by a few producers to the ACCC indicate that these measures may not be sufficient to ensure that there will not be under use of capacity. For instance, some submissions refer to constraints on the redistribution of unused allocations, including practical problems with allocation trading and possible conflicts with the application of conditional allocations. The failure of the first annual auction may be indicative of these constraints. The Newcastle Coal Infrastructure Group (NCIG) raised practical problems which indicate that conditional allocations cannot be effectively utilised and that a higher figure - 10 per cent rather than 5 per cent - is more appropriate[11].

The effectiveness of conditional allocations (in ensuring there is not unused capacity) relies on producers being provided sufficient incentive to 'over produce' so that this coal is available if there are unplanned shortfalls in production by other producers. Unplanned production shortfalls will release unused allocations, but these shipping allocations will only be taken up by other producers if they have additional coal and buyers on hand. The effective operation of the conditional allocation system needs to take account of production decisions and marketing arrangements that are typically made some six to twelve months out. It is uncertain that the design of the system accommodates this.

A large number of vessel arrivals in late February 2005 pushed the shipping queue out to 25 ships. By mid March this had been reduced to 21 ships with an average waiting time of 8.8 days. Coal producers appear to have spare shipping allocations for the first quarter of 2005 (due to large carry-over credits from the last quarter of 2004) which they can draw on to supply these ships. Without spare allocations the ability to service these ships would be constrained by both the physical capacity of the coal chain and the availability of coal from producers.

The ACCC issued its final determination on 15 April 2005 granting authorisation, subject to conditions, to PWCS for the Medium Term capacity balancing system (CBS) until 31 December 2007. "ACCC considers that the potential detriments are more likely to eventuate the longer the authorisation runs, and over time, there is a risk that the net public benefit could be reduced."[12]

To remove uncertainty that the net public benefit will be maintained over the duration of the authorisation, ACCC has imposed the condition that PWCS report annually (and publicly) on:

- Rail, port and other capacity expansion projects completed during the preceding calendar year, including the volume of increased capacity delivered.
- Nature of ongoing rail, port and other capacity expansion projects in the preceding calendar year, including and estimated completion date and the volume of capacity to be delivered.
- The nature of any capacity expansion investment along the coal chain for the following year(s)
- The annual total volume of coal exported through the Port of Newcastle for the preceding year.
- The declared annual coal chain capacity, the volume of allocation utilised during each quarter of the preceding year and the total volume of available allocation for each quarter of the preceding year.

Submissions in response to the final determination were due by 6 May 2005 and none were received and the determination came into force on 7 May 2005.

11 ACCC Record of Meeting with NCIG regarding Port Warahtah Authorisation, 7 February 2005, Melbourne

12 ABARE Report: *Infrastructure Issues in th Hunter Valley Coal Supply Chain, 2005*

4.4 Possible Alternatives to a Capacity Allocation System for the Hunter Valley Coal Chain

As indicated above, a range of measures being introduced over 2005 and early 2006 will add additional capacity to the Hunter Valley coal chain. As well as expanding capacity to over 90Mtpa, these measures should also enhance the ability of the coal chain to coordinate coal deliveries with ship loadings. They may also provide new opportunities to manage and reduce the costs of shipping queues. Further expansions to be implemented over the course of 2006 and early 2007 should, if investment decisions are not delayed, lift capacity of the coal chain to over 100Mtpa by mid-2007. Further major expansions at PWCS and/or the development of a third terminal are needed to lift capacity to over 120Mtpa.

Ongoing expansions in mine production and investments in new mine capacity will continue to put pressure on the Hunter Valley coal chain until port capacity expands to over 120Mtpa. Peaks in seasonal demand or spikes in the market will place additional pressure on the coal chain, even after expansions to over 120Mtpa are in place. The ABARE survey of Hunter Valley coal producers indicates that producers will want to supply upwards of 130 - 140Mtpa if prices are high. The ability to service these peaks has far reaching economic benefits. This is illustrated by the ABARE analysis on the economic contribution of coal exports. This analysis indicates that for each million tonne increase in coal exports NSW Gross State Product will increase by $A54 million and coal industry employment will expand by 73 people. These economic benefits reinforce the need to incorporate features that maintain pressure on the coal chain to realise latent or potential capacity.

The persistence of capacity constraints well into the medium term future needs to be reflected in logistics management and planning for the Hunter Valley.

In terms of day to day logistics management, a system designed to manage capacity constraints in the medium term needs to take account of the following:

- Primacy should be given to maximising throughput and realising the full potential of the coal chain. The system design needs to balance the benefits of ensuring sufficient coal is made available to maintain full export capacity against the additional costs associated with shipping queues forming (if there are no production shortfalls). Compared with the CBS, greater attention must be given to managing queues, if they form, rather than to avoid queues forming and risk losing potential exports.
- New capacity should be available for full utilisation as it becomes available.
- System design needs to take full advantage of improvements in logistics management including the computerisation of the logistics management.
- Logistics management needs to be responsive to irregular seasonal fluctuations - this may require a flexible approach to maintenance to defer scheduled maintenance in peak periods, it may require additional crews, it may require multi-user service providers to give coal trains and coal ships higher handling priorities, it may require different train configurations and/or ship sizes, etc. These measures may involve additional costs - arrangements will need to be in place to identify these costs and determine how they will be shared.
- Additional contingency plans need to be in place in the event that large shipping queues form. These contingency plans should be aimed at reducing the costs associated with these queues and bring queues back to manageable levels quickly. Solutions are needed that have the support of service providers, the shippers, the customers and the producers. For instance customers and producers may need contingency plans that allow the prioritisation and possible deferral of less urgent orders. Contingency plans could also include the activation of short term capacity allocation systems.
- Greater consideration should be given to developing market based solutions. Take or pay contracts are a starting point, but as part of managing excess demand service providers may need to be able to buy back contracts.

Most ports and rail systems have some form of take or pay contract. At Newcastle, these were

implemented for the first time this year (2005) and for a duration of one year. A framework to extend 'take or pay' contracts at PWCS is currently being refined and will be presented to the PWCS Board for approval. It is likely that the contracts will be long-term contracts in an attempt to underwrite expansion plans. It is believed that three-year contracts will be offered, however a service provider can not force a user to accept specific durations (which may have been of concern if these contracts are beyond 3 years, given that the successful 3rd terminal would be operational at this time and users may wish to change service providers). The contracts are likely to be standard as part of the Coal Handling Service Agreement.

Take or pay contracts typically have flexibility provisions – long term contracts provide certainty to the infrastructure owner and enable investment decisions to be made, they also provide certainty to users that they will be able to access a facility in the coming years and may provide financial incentives. However, some users may not wish to be locked in to long term contracts if they are unsure of their requirements beyond a few years, or their operations are likely to cease, or they wish to change service providers when new entrants in the market emerge. Short-term contracts may attract a premium and the user will also bear the risk that capacity may not be available for them in the coming years. Additional flexibility is possible through selling a 'take or pay' contract if a user no longer needs the facility or wishes to use an alternate facility and can find a buyer.

In terms of planning future infrastructure developments there is the need to ensure infrastructure investment decisions reflect the real needs of the industry. Capacity constraints and the way these are managed can mask underlying demand and can even lead to producers cutting back on their production and expansion plans. As indicated elsewhere in this report all participants in the coal chain need to come together to develop medium to longer term forecasts. Annual shipping forecasts should be balanced by take or pay contracts, with consideration be given to developing multi-year take or pay contracts. However, these arrangements need to be managed so as they do not become a barrier to new entrants, whether it be barriers to expanding or new coal producers or new infrastructure service providers.

4.5 DBCT Queue Management System (QMS)

On 5 April 2005 the ACCC received an application from Dalrymple Bay Coal Terminal Pty Ltd for authorisation of a proposed queue management system (QMS) designed to address the imbalance between the demand for coal loading services at the Dalrymple Bay Coal Terminal and the capacity of the Goonyella coal chain. DBCT Pty Ltd submitted their application in an attempt to reduce the excessive number of ships queued and waiting to enter the terminal and the consequent demurrage costs.

They believe that the current vessel queue is caused by high international demand, coal supply chain constraints; insufficient system capacity to match high vessel arrival rates and the lack of a capacity management mechanism to match vessel arrivals with system capacity. It is estimated that even with immediate QMS initiation it will take 2-3 months to reduce the current vessel queue to a workable queue.

The proposed QMS is broadly like the capacity allocation systems that have been operated by Port Waratah Coal Services at the Port of Newcastle. Independent consultants will determine the system capacity of the Goonyella Coal Chain and determine the extent that coal producers' using the terminal combined annual contract tonnages exceed the declared system capacity. Coal producers will then be allocated a pro-rata reduction of their annual contract tonnage for each month that coal shipping services through the terminal exceed the capacity of the Goonyella Coal Chain for a sustained period.

This period is not defined in the publicly available documents supporting the application. DBCT Pty Ltd will then be able to refuse to load a vessel beyond a producer's entitlement. In addition to their 'take or pay' contracts, producers that underuse their allocation may be subject to physical penalties (a reduced tonnage allocated in subsequent period). This under allocation will be distributed pro-rata among remaining producers. Producers will be able to trade their allocation and DBCT Pty Ltd are also considering the possibility of allocation auctions where producers buy or sell allocation, but there is little

detail of this in the application to the ACCC. Flexibility provisions will be included in the terminal regulations that govern the operations of the terminal and may include a proportional amount above a producer's allocation.

DBCT Pty Ltd has requested an interim authorisation so it could enable the QMS as soon as possible. As the QMS will operate on a periodical basis, if the ACCC decide not to provide a final authorisation, the QMS could be removed over a few months. Submissions in response to the request for interim authorisation closed on 25 April 2005 and the deadline for final submissions is 13 May 2005.

DBCT Pty Ltd is owned by six of the nine terminal users and these coal producers did not provide submissions in response to the application. Only three coal producers provided submissions to the ACCC, with Australian Premium Coals Pty Ltd (APC), a coal producer with no stake in the operating company expressing concern that they had not been informed of the application prior. APC's submission asked that the ACCC take into consideration that insufficient information on the operation of the QMS is contained in the application .

DBCT Pty Ltd consider that the proposed QMS will reduce demurrage costs by approximately A$350 million by the end of 2005; reduce inefficient coal stockpiling and associated costs and provide greater loading certainty; improve the competitiveness and the international competitiveness of the coal industry and the Goonyella coal chain; facilitate more efficient investment decisions; reduce environmental risks arising from large bulk carriers queuing adjacent to the Great Barrier Reef Marine Park; and assist transition until the Goonyella coal chain's capacity is increased.

DBCT Pty Ltd claim that the QMS will not result in public detriment as a coal producers ability to transport coal is not related to their efficiency or competitiveness; coal producers will still compete for international customers; the terminal will operate at full capacity; and investment decisions are unlikely to be reduced given that the QMS is to be operated by DBCT Pty Ltd while expansion and investment decisions are determined by Prime Infrastructure.

DBCT Pty Ltd is seeking the QMS to be authorised until the end of 2008 as they do not believe anticipated expansion will be operational until late 2007. While it is not possible, given the confidential nature of DBCT Pty Ltd's supporting documentation on the operation of the QMS and its review processes, to assess whether the QMS will provide the above benefits and not result in public detriment, it is essential that the QMS provides sufficient flexibility to ensure that maximum export capacity is realised.

5. Facilitation of Infrastructure Investment

Strategy

Investment to increase the capacity of existing infrastructure and for future infrastructure expansion projects needs to be aligned with industry requirements and brought forward to take advantage of the strong export market and where eligible, be awarded Major Project Facilitation status.

Summary

The requirement for rail and port infrastructure capacity to keep pace with expanding overseas demand for coal is a key issue for industry and government in Australia. Recognising the strategic importance of coal infrastructure projects, it is recommended that they be considered eligible for Major Project Facilitation status. The facilitation role provided by the Australian Government under this scheme can help streamline the approvals process at Australian and State levels and be used to help address policy and program issues that may impact on the development of the project.

Most coal chains are considering expansion options with nearly all service providers recognising the need to expand their operations. They are undertaking the advanced engineering and planning studies that will allow them to proceed with the project once all the development commitments and regulatory approvals are in place. This report discusses elsewhere measures to improve the forward planning process to help ensure that capacity is developed as it is needed. These involve significant investment management issues given the bulky nature of infrastructure projects and the cost of maintaining excess capacity for long periods being a substantial impost on infrastructure owners.

Coal Mining Investment Decisions

The Reserve Bank of Australia (RBA) undertook a review of Australia's resources exports in its February 2005 Monetary Policy Statement (MPS), in which it commented on capacity constraints associated with export infrastructure[13].

The MPS noted the significant impact that infrastructure constraints are having on the ability of the resources sector to expand export supply. The RBA undertook a survey of the expansion plans for iron ore and coal ports, but did not assess the capacity or expansion plans of the rail systems servicing the ports. The RBA survey indicated that although coal port capacity will expand by 13 per cent over the next two years (compared to 19 per cent growth since 2000), this will not match the expected expansion in production potential or export demand.

The Australian coal industry has sought to respond to a sudden upsurge in world coal demand and has been working to capacity to fill the gaps caused by disruptions in supply from other countries. Australian coal producers have committed $2.5 billion in capital expenditure to bring new capacity on line. This will go some of the way towards meeting the growth in world coal demand, but the primary focus of coal investors will be to meet the demands of their customers first. ABARE's analysis of Hunter Valley coal producers to supply projected world demand reinforces the need for infrastructure development to progress in line with industry need.

The majority of coal producers in the Hunter Valley and the Bowen Basin have plans to expand their operations over the next ten years to take advantage of increasing world demand. Plans include expanding

[13] RBA Statement Monetary Policy, February 2005

existing mine capacity (brownfield) and the development of new reserves (greenfield). Producers in the Hunter Valley indicated in the ABARE survey that they would be developing 48Mt of brownfield capacity and 67Mt of greenfield capacity. Market conditions would determine when and how these expansions occur.

Australia is currently taking measures to significantly enhance coal transport infrastructure capacity, including major rail and port investments in NSW and Queensland over the next few years to meet increased capacity demand. However, it is imperative that all sections of the coal supply chain, from loading at mine sites to loading vessels, expand systematically and in parallel to minimise misalignment of infrastructure (resulting in bottlenecks and under ultilisation of overall coal chain capacity).

Mines are also investing in coal loading efficiency which currently range from 1,500t/hr to 5,000t/hr. One in four coal load points do not meet their load times resulting in less efficient coal loading operations. This flows on down the supply chain contributing to train delays and lost rail pathways as well as trains running empty or partially full.

A detailed description of NSW and Queensland coal mine expansion plans are in the following section.

5.1 Transport Infrastructure Investment Decisions

The drivers determining the level and pace of transport infrastructure investment decisions have been changing, particularly with the move from public to private ownership and operation of infrastructure. Despite competition and access regimes being in place providers and users of infrastructure have not always reached agreement on key matters such as pricing, which in turn has impacted on the pace of investment decisions. It stands to reason that commercial parties who both stand to gain from increased investment in capacity expansion at a time of expanding future demand and high prices should be able to reach an agreement on win/win access and pricing arrangements

However what has occurred in some cases has been either of the parties seeking some form of regulatory arbitration / decision through a Government body which further delays investment decisions, given that they have often proven to be straight forward processes.

Take or pay contracts can provide a commercial signal that drives investment decision, however, coal producers will be reluctant to enter in to take or pay contracts governing expansions until new mine projects are near their production stage. Service providers need ongoing discussions with coal producers to ensure their future expansions match up with producer requirements. Most rail providers have take or pay contracts and some ports have introduced take or pay arrangements to underwrite necessary investment. This option is being practiced for the facilitiation of future investment.

Some coal producers in both NSW and QLD have expressed concern that their own planned developments may be curtailed through a lack of necessary investment in coal chain infrastructure. There is also some concern that organisations controlling and/or managing the provision of essential infrastructure, may delay making timely investment decisions. This in effect can place a cap on the amount of coal that can be exported. In the absence of a proactive, coordinated and consultative investment plan for the coal supply chain, coal producers may be reluctant to bring mine expansion plans online earlier. Potential new international investors in Australian coal mines may also be discouraged.

What will encourage individual operators to invest?

There are a range of factors discussed in this report which will underpin future investment decisions related to coal chain infrastructure, they include:

- relative rate of return on investment
- pricing arrangements
- access arrangements for users
- market forecasting and outlook information
- economic, environmental and planning assessment processes
- access to adequate financing; and
- potential for duplication of infrastructure

Ownership arrangements and structural impediments are key issues that have affected individual coal service providers' decision to invest in infrastructure.

To date investment in critical transport infrastructure has often occurred in a less than optimal fashion often focussed on individual points of the supply chain. A key consideration for improving infrastructure efficiency is that any future development plans are done in a coordinated timely manner and in a way that does not negatively impact on capacity. This will require mine, rail and port operators to share information that in the past may have been seen as 'commercially sensitive'.

Diagram 8 highlights the various major NSW and Queensland coal chain service provider investment projects planned to commence over the next 3 years.

Diagram 8: NSW and QLD Coal Chain Service Provider Investment Projects

New South Wales	Development Project	Timing	Benefit
Port of Newcastle	*Newcastle Channel Improvement Project* - deepening and widening of port's principal navigation channel - cost estimated $30 million to $100 million	2005	- better access for capsize vessels in to the port - potential increased number of ships per tide and increased export volumes
Port Kembla [+]	- further assessment is needed regarding the cost effectiveness of diverting coal traffic to Port Kembla to take up excess capacity at Port Kembla. - may be some challenges accessing trains through Sydney metro area diverting away from Hunter Valley	current	- ff additional train set were brought onto the Port Kembla freight system may be opportunity for some other lower Hunter Valley coal producers to transport coa l into Port Kembla
Coal Terminal Plans	*Port Waratah Coal Services* - expansion of nominal ship loading capacity from 89Mtpa to 102Mtpa ($170 million) - planned expansion only feasible at Kooragang - possible further expansion to 120Mtpa *Possible Third Termina l* - two proponents have been shortlisted, final decision in August 2005	2007 2011	- as a short to medium term measure this expansion will allow for increased throughput - up to 60Mtpa additional Port capacity - potential increase in competition
Rail Network	*ARTC Infrastructure Investment Program & Hunter Valley Corridor Strategic Plan* - $152 million program to upgrade Hunter Valley network including Sandgate overpass - additional $120 million announced for signalling, track duplicatio n and passing loops *Australian Government AusLink, Land Transport White Paper* - $109 million additional rail works *Pacific National freight operator* - additional train sets / rolling stock Queensland Rail - four new train sets servicing BMA mines	2005 (3-5 years)	- increased capacity from 85Mtpa to up to 140Mtpa - linkages with third coal terminal development - reduction of congestion of freight and coal train movements in the Hunter Valley - minimise disruptions to coal traffic otherwise had to stop for passenger traffic - larger train sets and therefore increased coal haulage capacity - increased competition above rail; 12 per cent Hunter Valley freight moved - additional train sets increasing rail capacity

Queensland	Development Project	Timing	Benefit
Abbot Point *	*Abbot Point Coal Terminal* - master planning exercise to identify possible expansion paths, costings and timeframes *Northern missing link* - Goonyella – Newlands connection - Queensland Government to fast track construction of 78 Km rail link	current	- possible increase in port capacity from 15Mtpa to 25Mtpa - increased capacity availability may provide impetus for construction of the "northern missing link" rail line connecting Goonyella corridor to Abbo t Point corridor - additional security for coal exports - opportunity for Northern -Bowen mine expansions and new mine developments
Hay Point	*Hay Point Coal Terminal* - proposed expansion involving extension of two existing coal stockpiles and construction of additional bund and stacker/reclaimer - upgrading selected in -loading and yard conveyers widths, speeds, structures and chutes	Immediately subject to statutory approvals are granted	- increase in port capacity from 34Mtpa to 39.5Mtpa - operational improvements for stacker reclaimer efficiency to 6,000t/hr and possible peak reclaiming capacity of 8,000t/hr
Dalrymple Bay	*Dalrymple Bay Coal Terminal* - master plan has identified potential need to increase terminal capacity - $30 million upgrade to increase capacity from 55Mtpa to 60Mtpa - additional phased expansion up to 80 -85Mtpa has been approved	2004 completed end 2005 end 2008	- staged increase in port capacity - expansion of DBCT to 80 -85Mtpa will make it the largest coal export terminal in the world.
Gladstone	*Gladstone Port Authority* - Ministers' in -principal approval for a $167.5 million expansion plan of the RGTCT - completion of RGTCT stockpile 16 - $46.5 million for a fourth berth and additional infrastructure - Port of Gladstone BPCT expansion from 5-7Mtpa	2004 commenced Dec 2003	- increase in capacity from 40 -45Mtpa - this project w ill increase capacity by 8Mtpa in 2005-06 and a further 6Mt pa in 2006-07 - overall expansion plans will translate to total export capacity of 44.5Mtpa in 2004-05 and 62 -65Mtpa by 2008-09
Central Queensland Rail Network	*Queensland Rail (QR)* - upgrade of 18x3900t locomotives for heavy haulage ($88m) - 500 new coal wagons ($98.6m) - 110km spur for Xstrata Rolleston Joint Venture ($240m)	2003-04	- increased improvement of QR's coal rolling stock - 110km spur will be the longest rail line to be built in Queensland in nearly 20 years

* Curragh Mining has applied to the QLD Department of Transport for approval to haul > 0.3Mtpa by road (180km) to Stanwell Power Station, to free up rail network to Gladstone

\+ A small New Zealand coal producer - Francis Mining - has committed to a seven-year contract to barge a total of 1Mt coal from its West Coast operations in New Zealand to Port Kembla for onwards export.

The current and proposed coal service provider invesment projects support the planned expansion of various coal mining operation in NSW and QLD. Timing and coordination of these proposals to take into account relevant regulatory conditions is vitally important.

Based on ABARE's supply analysis, and recognising the uncertainty surrounding future plans and approval processes for the development of the coal chain capacity in the Hunter Valley, the key question is not if additional infrastructure will be utilised, it is more about whether high cost step expansions in infrastructure will be fully utilised immediately or in two, five, or ten years. The potential cost of over investment is therefore based on the time value of money. The cost of delayed or no investment will be the loss of potential export revenue and market expansion.

The export coal industries in NSW and QLD are considered to be of State Significance, with industry projects often given Ministerial approval.

NSW Infrastructure Planning

In 2004, the NSW Government announced a major overhaul of the NSW planning system to ensure that its strategic objectives are reflected in all decision about land use in NSW and will guide major decision and

plans by State and Local government and inform private sector investment for the next 30 years. A State Strategic Planning Framework, is to be created and will contain a number of strategic planning documents including a Metropolitan Strategy for the Greater Metropolitan Region with a number of regional strategies covering certain priority areas. The Lower Hunter region has been designated as a State Government priority.

The Minister for Industry, Tourism and Resources may grant Major Project Facilitation (MPF) status for major and/or strategic new investment projects. It is recommended that coal infrastructure projects with appropriate financial backing be eligible for consideration by the Minister for MPF status. This reflects the strategic importance of coal infrastructure projects and the support that is available under this scheme to streamline approvals processes at the Commonwealth and State Government level.

The regional strategy for the Lower Hunter region could have major impacts on the future operations of the coal industry including the provision of infrastructure and how it will fit in with other industry, community and environmental objectives. It is important that all stakeholders are involved in the development of this regional strategy given the value of the Hunter Valley coal industry to the State, particularly the Lower Hunter and nearby regions.

Queensland Infrastructure Planning

In 2004 the Queensland Government announced major rail and port infrastructure works that should direcetly benefit the coal industry. Public sector funding of more than $570 million in 2004-05 will target coal related projects for rail and ports.

The Queensland Government also established in 2004 an inter-departmental Coal Infrastructure Coordination Group in a bid to address infrastructure requirments triggered by the increase in world demand for coal. The Group, chaired by the Department of State Development and Innovation, has 11 members from across the QLD Government, including from the Departments of Premier and Cabinet, Treasury, Transport, Employment and Training, Energy, and Natural Resources and Mines. They will look at all issues faced by the Queensland coal industry including employment, safety, transport, energy, and infrastructure.

In all States, given the lead time for the development of transport infrastructure it is essential that proponents submit development applications to relevant regulatory bodies and government departments well in advance of infrastructure requirements. Where the industry is running at or near full capacity, govenments need to facilitate or fast track consideration of projects within state or regional environmental planning policies and strategies. The Queensland Coal Infrastructure Coordination Group appears to provide a mechanism for doing this.

Australian Government Facilitation

Further more, the Australian Government Minister for Industry, Tourism and Resources may grant Major Project Facilitation (MPF) status for major and/or strategic new investment projects. It is recommended that coal infrastructure projects with appropriate financial backing be eligible for consideration for MPF status by the Minister. This reflects the strategeic importance of coal infrastructure projects and the support that is available under this scheme to streamline regulatory processes at Australian and State Government levels.

An initial contact point in the Australian Government will be assigned to projects that receive MPF status. Facilitation services will be tailored to address the nature and complexity of the project and improve the familiarity with the Australian business environment. Services may include access to capable and competitive Australian suppliers, obtaining decisions on necessary Government approval processes as administered under Australian legislation, referrals, guidance and contacts with relevant Australian

Government agencies for various assistance programs. MPF status can be used to facilitate relationships between the Proponent, key Australian, State and Territory government agencies involved in regulatory processes including liaison between the Minister for Industry, Tourism and Resources, the Prime Minister of Australia, the Prime Minister's Strategic Investment Coordinator and relevant ministerial colleagues. MPF status can also enhance the ability to respond to specific impediments or policy issues raised during the regulatory process or during the project's development.

6. Competition - Third Party Access

Strategy

Develop a national reform agenda for the rail and port sectors that integrates coal supply chain needs including through:

a. consideration given to the development of a nationally coordinated framework as part of the COAG Review of National Competition Policy to ensure commercially negotiated outcomes for access to essential infrastructure;

b. a regulatory regime that focuses on incentive mechanisms to promote optimal operation, use of, and investment in, essential infrastructure services.

Summary

The Australian coal industry is likely to be a major beneficiary of ongoing reforms in National Competition Policy and regulated access regimes. The COAG Review of National Competition Policy (due by end-2005) is likely to focus on the recent findings by the Productivity Commission[14] that consideration be given to the development of a nationally coordinated reform framework for freight infrastructure. Access regimes and their impact on investment decisions are also likely to be a major focus of the Prime Minister's Taskforce on Exports and Infrastructure. However, in order to address current capacity constraints, there is the need to quickly resolve outstanding access arrangement issues between infrastructure service providers and users. There is a need to encourage and facilitate commercial negotiations and finalise existing access arrangements.

This is particularly relevant in finalising the Access Undertaking for the Dalrymple Bay Coal Terminal (DBCT). Under the Queensland competition policy arrangements, there is a responsibility on the access provider and the access users to negotiate on price and non-price terms. The Queensland Competition Authority (QCA) becomes involved only where agreement cannot be reached and either party has lodged a dispute notice with the QCA. Commercial negotiations for access have not been successful. On 20 June 2003, a draft access undertaking was submitted to the QCA. In October 2004, the QCA released its draft decision and announced that it proposed not to approve DBCT's Draft Access Undertaking as presented to it. The draft decision sets out the ways in which the QCA considers the draft access undertaking should be amended in order for it to be approved. A further public consultation process occurred and the QCA released its final decision in April 2005.

Commitments to capacity expansions are unlikely to be made until an agreed access regime is in place. Expansion plans at DBCT are already some 5-10Mtpa and some 12-18 months behind industry demand. At current prices, every million tonne shortfall in capacity is costing in excess of $100 million per annum in lost export revenue. This is in addition to the substantial additional costs associated with bottlenecks at the port - demurrage penalties are currently running at a rate exceeding $300 million pa. There is an imperative on all parties to work together to finalise the access regime for DBCT.

6.1 Coal Supply Chain Access Regimes

Various institutional and regulatory reforms to promote more efficient delivery of infrastructure services have been implemented Australia wide under the National Competition Policy (NCP). At the heart of these reforms is the Hilmer report which among other things called for competition reform based on

[14] Productivity Commission 2004, Review of National Competition Policy Reforms, Discussion Draft, Canberra, October

competitive neutrality and an 'indifference' to the ownership of infrastructure (public or private). There are various ownership structures evident in Australian coal infrastructure (see Chapter 3). There is essentially no 'right' structure with all having strengths and weaknesses depending on factors such as the number of users and the relationship of owners to users. Depending on the circumstances each structure may require various mechanisms to ensure effective competition. For instance government owned systems need to compete with private firms without any institutionally based advantages or disadvantages (legislative changes to ensure competitive neutrality have been a priority of the NCP). Privately owned, multi-user systems would need to be structured to ensure that ownership or control of the system does not provide for a competitive advantage to some users at the expense of others and competition in general. Mechanisms such as effective 'ring fencing' of the operator from users and effective third party access regimes can be adopted in these situations.

The Hilmer report found that competition reform in Australia required the development of effective regulatory arrangements for essential infrastructure. The 'Hilmer recommendations' accepted by the CoAG have been implemented through various processes including incorporating a national access regime in the *Trade Practices Act 1974* (TPA).

Clearly, there is a significant focus on the impact that national competition policy and regulated access regimes have on investment, innovation and the operation of Australian coal supply chains.

The Productivity Commission's (PC) *Review of National Competition Policy Reforms* - Discussion Draft, identified the need for further reforms to address the significant impediments to competition and efficiency in several infrastructure areas. The Commission specifically identified the need to develop nationally coordinated reform frameworks for freight and passenger transport and has called on COAG to sponsor as a matter of priority , "…the development of a national reform agenda for the rail sector that integrates current work in this area and establishes clear timelines for implementation of reform."[15] **Australia's size and distance from major overseas markets demand an efficient and reliable freight transport system across all modes.**

The National Access Regime (the Regime), allows third parties to seek access to the services of certain essential infrastructure facilities on reasonable terms and conditions if commercial negotiations fail. Importantly, the Regime is not intended to replace commercial negotiations between access seekers and providers, and aims to support the legitimate interests of essential infrastructure owners.

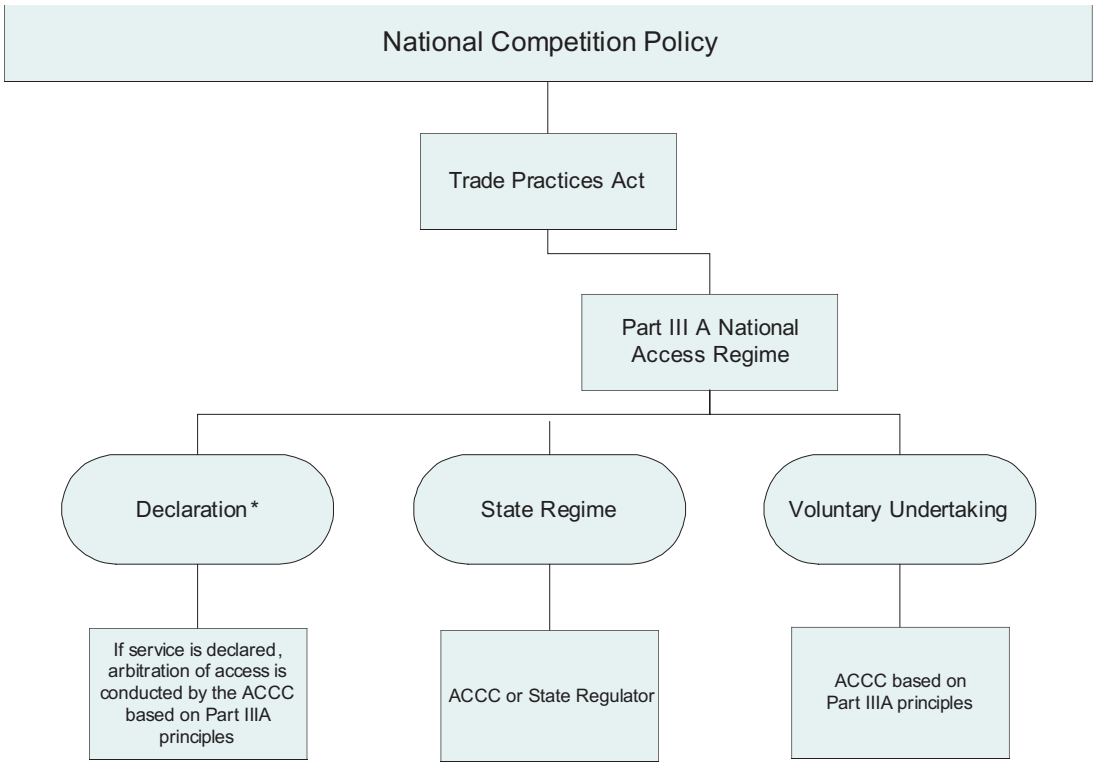
The access framework within the *Trade Practices Act 1974* can apply to infrastructure through a number of avenues.[16]

- States can establish their own State based access regimes. Part IIIA of the TPA provides a national access regime to facilitate third party access but also allows for States and Territories to establish their own regimes and seek 'protection' from the Declaration route under the national regime for services covered by an 'effective' regime.
- Infrastructure providers can seek approval for a voluntary access 'undertaking' from the ACCC under Part IIIA of the TPA.
- Access seekers can seek 'declaration' of essential infrastructure under Part IIIA of the TPA if it is not subject to an 'effective' regime.

15 Productivity Commission 2004, Review of National Competition Policy Reforms, Discussion Draft, Canberra, October (page XXXIX)

16 See Glossary in appendix 3c for a description of Regulatory Authorites.

Diagram 9: Access framework within the TPA



*Services cannot be declared if already subject to an 'effective' access regime .

The *Review of the National Access Regime*, released by the PC on 17 September 2002 supported the Regime's retention but has made thirty-three recommendations to improve the Regime's operation.

The Australian Government's response to the review supports the majority of these recommendations and agreed that scope existed for improvements to the Regime. This included, for example, making changes that clarify the Regime's objectives and scope, encourage efficient investment in new infrastructure, strengthen incentives for commercial negotiation and improve the certainty and transparency of regulatory processes. The changes being proposed by Government provide a balance between ensuring a means for business to gain access to infrastructure while providing incentives for new investment in essential infrastructure. The changes are also designed to provide infrastructure users and investors with confidence and certainty about the regulatory framework so they are able to make well informed decisions.

Implementation of some proposals requires changes to clause 6 of the Competition Principles Agreement (CPA), to which all State and Territory governments are parties. There are also changes needed to the TPA.

The potential benefits of facilitating competition through an approach which largely relies on coordination through the CoAG process offer greater consistency, improved efficiency and reduced duplication. These factors clearly accord with the notion of Australia as a single market competing in a global environment and are very relevant to the Australian coal export sector.

In cases where commercial negotiations fail, Australian regulatory authorities assess the complex arguments and arrive at arrangements that aim to provide an appropriate balance between a fair return on investment, and reasonable prices for users, on a case-by-case situation. However, issues of 'national interest' including consistency, reducing uncertainty, timeliness and appropriate investment incentives can go beyond the specific terms and conditions for future access in sectoral infrastructure. Demonstrated in the case of DBCT, the failure so far of commercial negotiations for third party access and the time taken to develop a specific regulated access regime is imposing huge additional costs on industry and on Australia's

export performance. Even when these regimes are in place there is still no guarantee that the infrastructure investment decisions will be fully responsive to the needs of exporters or to the national interest.

Fragmentation of the Australian regulatory regime has been highlighted in a number of sectors, for example there are some 30 regulators in the Australian rail industry. The stationery energy sector by comparison has less than twenty regulators, and yet has moved to reduce these through the establishment of the National Energy Regulator.

An effective nationally coordinated reform framework could deliver improvements in the regulation of essential infrastructure and address regulatory barriers that can impede the full realisation of export opportunities. Such a framework should:

- integrate the considerable work that has already occurred in this area.
- address potential barriers associated with multiple rail access regimes within a state or different rail access regimes between states (the future development of coal deposits in northern NSW may need to be shipped via Brisbane, QLD). A national access system could reduce the impact of regulation on interstate coal supply chain investment decisions
- reflect the PC's findings that more should be done to ensure that pricing regimes for regulated infrastructure services give appropriate incentives to providers to properly maintain facilities and to enhance and augment networks.[17]

Priority must also be given to the transitional arrangements that will be needed if it is decided to develop a nationally coordinated framework. The experience of developing national electricity markets indicates the considerable passage of time involved in developing a national coordinated regulatory regime. Coal transport infrastructure is already capacity constrained and investments to expand infrastructure capacity in key areas are years behind the needs of exporters. Primacy at this stage must be given to bringing forward expansion plans. There is a need to quickly resolve any outstanding disputes between infrastructure service providers and users over access arrangements which may be delaying investment decisions. This may require parties to return with best intents to the commercial negotiation table.

As suggested elsewhere in this report, all participants in the coal chain need to work together to address these constraints.

It is anticipated that a nationally coordinated reform framework may be developed further in the Final Report of PC Inquiry into NCP. This report has been delivered to the Government and was publicly released on 14 April 2005. COAG's review of NCP will be completed by the end of 2005. Regulatory barriers are also expected to be considered by the Prime Minister's Taskforce on Exports and Infrastructure which was announced on 18 March 2005 to *identify any bottlenecks of a physical or regulatory kind in the operation of Australia's infrastructure which may impede the full realisation of our export opportunities.*[18]

A number of third party access regimes for services provided by coal supply chains are currently before Australian and State competition bodies. Decisions are pending on access regimes in Queensland for the Dalrymple Bay Coal Terminal and for users of Queensland Rail's Central Queensland coal region rail network under the State based regime established by the QCA Act. It is worth noting that the Queensland regime has not been put forward for assessment as an 'effective' regime[19]. In NSW the submission of an Access Undertaking by the ARTC to the ACCC under Part IIIA of the TPA for access to the Hunter Valley rail network is pending.

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17 The PC recommended that "Governments and regulatory agencies should continue to explore opportunities to improve the efficacy of price setting and access arrangements for regulated infrastructure providers. Particular emphasis should be given to improving incentives for providers to undertake investment to maintain existing facilities and expand networks, including through the implementation of clear and nationally consistent principles to guide regulators. Specific approaches outlined in recent Productivity Commission reports into the National Access Regime and the Gas Access Code provides a basis for improvements in this area." (page XLI)

18 Prime Minister of Australia Media Release, 18 March 2005.

19 This declaration by the Queensland government puts the access arrangements into the State based regime and is different from the process of a Declaration under Part IIIA.)

Dalrymple Bay Coal Terminal (DBCT) Access Regime

The Dalrymple Bay Coal Terminal (DBCT) is declared for third party access under Part 5 of the *Queensland Competition Authority Act 1997* (QCA Act).

The declaration was made by the Queensland Government as part of the restructuring process leading up to the lease of the terminal, and in response to concerns that the lease could be acquired by an entity that may have little interest in expanding the facility or may exploit its market power.

The QCA Act provides for the QCA to approve an access undertaking in relation to a declared service. While Part 5 of the QCA Act imposes broad obligations on a facility owner and access provider, an access undertaking for a service contains details of the terms and conditions on which an owner undertakes to provide access to the service.

Declaration for third party access requires that the operators of DBCT must not hinder or prevent access to the declared service and must negotiate in good faith with those users seeking access.

Subsequent to the lease of the port in 2001, the new owners and operators entered into a Ports Services Agreement (PSA) which among other things required Prime Infrastructure's wholly owned subsidiary DBCT Management P/L (the lease operator) to prepare and submit a draft access undertaking to the DBCT Holdings P/L (Holdings)[20], the owner of DBCT by September 2002. Following approval of the draft access undertaking by the owner, the operator was required to submit the draft access undertaking to the QCA for approval.

The access regime established by Part 5 of the QCA Act is a negotiate/arbitrate model. That is, the prime responsibility is on the access provider and the access seeker to negotiate on price and non-price terms, with the QCA becoming involved only where provided for under the QCA Act - for example, where agreement cannot be reached and either party has lodged a dispute notice with the QCA. The QCA Act also provides for the QCA to approve an access undertaking which sets out in greater detail the relevant access rights and obligations.

Commercial negotiations for access have not been successful and on 20 June 2003, a draft access undertaking was submitted to the QCA by the operator on behalf of the owner of DBCT[21].

The QCA has conducted a detailed public assessment of the access arrangements. In October 2004 the QCA released its draft decision and announced that it proposed not to approve DBCT's proposed Access Undertaking as submitted, and has outlined changes that need to be made for the Undertaking to be acceptable. A further public consultation has occurred and a final decision was made on 22 April 2005. The terms and the final decision are discussed below.

As noted above, the regulatory regime seeks to provide certainty and lend support to the legitimate interests of the owners of the essential infrastructure, and is not intended to replace commercial negotiations between access seekers and providers where these are effective.

Clearly, these objectives have not been met to date in the DBCT process. Investment and innovation has not occurred in time to meet demand, and future expansion plans are on hold pending the outcome of the QCA decision. Much of the concern has centred around pricing and capacity expansion incentives in the draft access undertaking.

[20] Queensland Government owned corporation

[21] QCA Draft Decision 15 October 2004 pg 111

Pricing

The QCA identified the proposed reference tariff and the various elements used to calculate it as the greatest difference between the views of the respective parties. DBCT Management proposed an increase in the existing price of the coal handling service from $2.08/tonne (with price discount rebates) to $2.77/tonne. In contrast, the DBCT User Group (representing all users) presented a viewpoint that the reference tariff should be considerably lower than the existing price.

The QCA proposed an annual revenue cap of $76m with respect to the existing asset, which is equivalent to an average reference tariff of $1.53/tonne (without rebates). Under the QCA's proposal, future capital expenditure would add to the asset value - and corresponding revenue cap - only as it is expended. Hence, calculation of the revenue cap did not require an allowance for capacity expansion.

Although the QCA's revenue cap appears small when assessed against the reference tariff proposed by DBCT Management, the QCA clearly considers it adequate to provide sufficient revenue to facilitate infrastructure investment. Revenue adequacy was described as a key consideration in the calculation of the cap: *'Revenue adequacy is critical to ensuring that the terminal earns sufficient revenue to maintain the infrastructure appropriately and to provide sufficient incentive to expand the terminal when required.'*[22]

QCA's revenue cap calculations were closely based on the figures provided by DBCT Management, although with several significant 'downward' adjustments to correct identified biases or errors in the figures. Significant overall differences between the assessments were that the QCA determined a lower asset cost - $824m compared to $1,084m - and a lower weighted average cost of capital (WACC) - 8.2 per cent rather than 10.5 per cent. The QCA provided detailed explanations for the variations between the assessments.

DBCT Final determination

The QCA released its final decision on DBCT Pty Ltd's Draft Access Undertaking on 22 April 2005. The QCA has upheld its draft decision and formally decided not to approve the DBCT draft access undertaking in its current form. However, the final decision allows for a revised access undertaking to be resubmitted to the QCA for approval encompassing the matters raised in the final decision and identifying all of the changes that need to be made to it so that a complying undertaking may be lodged and approved. The Access Undertaking covers the period 2004-2009 and is to be reviewed at one and three years after commencement.

The QCA's final decision in relation to the terminal provides for a price of $1.72/tonne in respect of current capacity, more than 12 per cent higher than the draft decision of $1.53/tonne. This price is based on an asset value of $850 million and a weighted average cost of capital (WACC) of 9.02 per cent, compared with the draft decision on an asset value of $823.7 million and a WACC of 8.20 per cent. The QCA believe that the above matters remove any potential regulatory road blocks to the expansion of DBCT.

In adopting this higher WACC, the Authority accepted the advice of the Allen Consulting Group that, while a WACC of 8.54 per cent was sufficient for the existing terminal, the proposed major expansion added to the level of risk, particularly in the light of the uncertainty about the long term outlook for demand. It also notes that Prime Infrastructure had indicated that a WACC of 9.02 per cent was the minimum it considered to be reasonable. The WACC is equivalent to a return on equity of 11.84 per cent, which is 600 basis points above the risk free rate.

[22] QCA Draft Decision 15 October 2004, page 100

A detailed capital expenditure program was not included in the draft access undertaking submitted to the QCA, or subsequently proposed in response to the draft decision, the QCA decision includes a framework that facilitates terminal expansions and for the efficient costs of such expansions to be automatically added to the regulated asset base provided certain criteria are met.

The QCA will automatically approve expansion proposals where:

- the expansion path is consistent with a Master Plan approved by DBCT Holdings Pty Ltd;
- 60 per cent of the proposed expansion is subject to firm contractual commitments; and
- 60 per cent of other users do not oppose the expansion.

Expansion proposals that do not meet these criteria will be considered by the QCA on their merits. However, the QCA indicates in its decision that it will approve any prudent expansion proposal. To streamline the assessment of whether expansion costs are efficient, the QCA has included the option of a tender approval process along the lines of that included in the Gas Code, which provides for the QCA to approve the process for conducting the tender and selecting tenderers for the capital works.

Capacity Expansion Incentives

QCA has proposed a revenue cap system, with the intent of optimising incentives for infrastructure investment. According to the QCA *'a revenue cap is the form of regulation that is likely to create the best incentives for the access provider in terms of contracting for throughput and managing terminal capacity in an optimal way*". The DBCT User Group, which initially proposed introducing a revenue cap, considered that the revenue cap approach addressed *'the issue of expansion timing by providing DBCT Management with a defined revenue stream for new capacity'*.[23]

The Draft Access Undertaking contains a consultative process to facilitate capacity expansions along with two additional trigger events. These events are when (i) users seeking access have contractually committed to a set per centage of the next capacity expansion (i.e. via off-take agreements); and (ii) when existing access holders with more than a set per centage of the existing contracted tonnage request a capacity expansion. The process is designed to ensure *'capital expansions will occur as and when required to meet the needs of users'*.[24]

The QCA notes that it is an uncommon feature of access regimes in Australia that prices are unregulated and that reference tariffs exclude provision for a capital expenditure program. However, they also note that the revenue-cap system is supported by the DBCT User Group. Moreover, the QCA has accepted the approach subject to a number of conditions. These relate to the governance arrangements to ensure there is sufficient clarity and certainty in the scope of the operating and maintenance charges and in the capacity expansion triggers.

It can be argued that the proposed regulatory changes - specifically, introducing a revenue cap as well as capacity expansion triggers - appear to improve regulatory efficiencies and incentives for infrastructure investment. This is relative to the existing tariff, rebate and off-take arrangements. Under the existing regulatory arrangements, a terminal infrastructure charge is applied to each tonnage of throughput. There are also take-or-pay and rebate components to dampen revenue variations associated with volume fluctuations. This effectively constitutes a hybrid revenue-price cap scheme - but with significant regulatory inefficiencies. The regulatory changes proposed by the QCA - specifically, introducing a revenue cap as well as capacity expansion triggers - appear to improve regulatory efficiencies and incentives for infrastructure investment.

Capacity expansions initiated by DBCT Management would deliver a defined revenue stream for

[23] QCA Draft Decision 15 October 2004, page 97

[24] QCA Draft Decision 15 October 2004, pg 39

shareholders under the revenue-cap approach. This provides clearer incentives for infrastructure investment compared to the existing hybrid revenue-price cap system. The proposed capacity expansion triggers also help ensure terminal users can achieve expanded capacity when required, specifically when there are commercial off-take agreements in place and/or significant commercial user support.

This system caters for structural and sustained increases in demand where access seekers can provide some degree of off-take certainty. However, it is not designed to deliver reserve capacity to cater for seasonal peaks in demand[25] or unanticipated expansions in demand.

With respect to terminal profitability, the proposed revenue cap appears to be set sufficiently high for DBCT Management to be encouraged to maintain infrastructure appropriately and to expand capacity as required. This is, however, conditional to some extent on the strength of the argument that the nominal, after-tax WACC of 8.2 per cent is enough to provide a solid commercial return. Calculation of an appropriate commercial discount rate is dependant on an 'estimate' of project risk not included (or accommodated) in the cash flow profile. For example, a low discount will be justifiable, where contractual take-or-pay contracts underpin project revenue flows. In some cases these risk variables, which may be contingent on pending contractual arrangements, may be difficult to accurately embody into a discount rate estimate. For DBCT Management, choice of discount rate may be the main basis for contesting the QCA draft undertaking.

Detailed design and engineering work for a $650-850 million expansion to DBCT to increase capacity to over 80Mtpa has commenced. If access arrangements are resolved soon and Prime Infrastructure commits to undertaking this investment the first phase of expansion work could lift capacity to 65Mtpa by mid-2007. However, demand is expected to be as high as 70Mtpa by the end of 2006, possibly reaching 90Mtpa as early as 2008. Expansions are now running some 5-10Mtpa and some 12-18 months behind industry demand. At current prices, every million tonne shortfall in capacity at DBCT is costing in excess of $100 million per annum in lost export revenue. This is in addition to the substantial additional costs associated with bottlenecks at the port - demurrage penalties are currently running at a rate exceeding $300 million pa. There is an imperative on all parties to work together to finalise the access regime for DBCT.

Queensland Rail - Draft Access Undertaking 2005

The services provided by QR's intra-state rail network were declared by regulation in 1997, making the services subject to the third party access provisions of Part 5 of the QCA Act. As a result of that declaration, the facility owner, access provider, access seekers and access holders gained rights and obligations relating to the negotiation of the terms and conditions of access to QR's rail transport infrastructure. This is the same process as for the DBCT.

The QCA approved QR's current access undertaking in December 2001, and that undertaking expires on 30 June 2005. To enable a replacement undertaking to be approved in time to take effect from that date, in November 2003 the QCA issued an initial undertaking notice requiring QR to submit a draft access undertaking for the declared services for the period commencing 1 July 2005. QR submitted a draft access undertaking on 30 April 2004, and additional parts of that undertaking, namely reference tariffs and standard access agreements, in May 2004. Being submitted 14 months early allows extensive consultation with industry before new access undertaking takes effect and is to be encouraged by all entities.

The QCA invited submissions on QR's draft 2005 Access Undertaking by 30 September 2004. Further submissions addressing only matters raised in other parties' submissions were accepted by QCA up to 12 November 2004.

A draft decision has not yet been reached by QCA.

[25] If producers want to move above average tonnages to meet seasonal peaks they may need to enter into take or pay contracts that exceed their annual requirements. http://www.qca.org.au/www/DBCT_Draft_Access_Undertaking_FINAL_DECISION.pdf

QR is currently the sole provider of coal industry rail services in Queensland and has actively pursued dedicated coal contracts with recently announced new coal mining develpments in the State.

ARTC's Hunter Valley rail network

ARTC currently have an Access Undertaking for the interstate mainline links in WA, SA, NSW and Victoria.[26]

Access to the Hunter Valley Coal Network is currently granted to access seekers through the previous owner - NSW Rail Infrastructure Corporation's (RIC) existing Access Undertaking. The ARTC has acquired the leasehold for the Hunter Valley network and is bound by RIC's existing access undertakings until they submit a new access undertaking to the ACCC and it has approved their Access Undertaking.

Under ARTC's Hunter Valley lease arrangements, they are required to lodge an access undertaking with the ACCC pursuant to Part IIIA of the *Trade Practices Act 1974* as soon as practicable after commencement of and in accordance with the lease and will seek to have it approved by the ACCC. ARTC have committed to submitting an Access Undertaking for the Hunter and NSW non-urban network to ACCC within 12 months - 18 months.

ARTC expects to be able to reduce track access charges for transporting coal by 20 per cent in a new Access Undertaking.

Passenger priority on rail networks

The rail access regimes noted above will clearly have to establish effective pricing and capacity expansion arrangements suitable to users and the owners/operators of the infrastructure. In addition the access arrangements will also need to recognise the different users on the systems, and the value of these users to the economy. Currently, as part of the lease of the Hunter Valley rail network, ARTC is bound by NSW legislation which includes an obligation on any rail track owner and operator to implement reasonable priority for passenger services. The metropolitan passenger network remains owned and managed by NSW through RailCorp. However NSW and ARTC undertook to work cooperatively to facilitate the efficient pathing of rail services subject to passenger priority principles that exist along the entire NSW network, including those lines leased or managed by ARTC. ARTC is also responsible for the management of the Country Regional Network.

Similarly, QR is bound by the *Transport Infrastructure Act 1994* (Qld) prioritising the right for Queensland Transport to reserve capacity for existing or proposed regularly scheduled passenger services without entering into an access agreement. Around 90 per cent of the freight carried by QR is coal and two-thirds of this coal is transported along the Goonyella and Newlands rail corridors. Although the use of these two rail network for passenger or non-coal freight is much less significant than that occurring in the Hunter Valley, governments and regualtors in all jurisdictions should be encouraged to take into account the specific needs of all users of rail networks and ensure the development of access arrangements based on coordinated scheduling and balanced economic, social and environmental considerations rather than pre-determined priorities.

Passenger and non-coal freight priority, particularly on single line sectors, takes rail capacity away from coal mines. Additional capacity is lost over summer when wheat trains take paths which can coincide with strong export periods for coal. On lines where it is considered to be in the economic interest of the State and region to provide access to more rail pathways for the coal export industry in the Hunter Valley, alternative priority settings may be desirable.

26 ARTC www.artc.com.au

7. Regulatory Approvals

Strategy

Review regulatory approval processes with a view to ensuring the early resolution of consideration of proposals for infrastructure capacity development.

a. Relevant Government jurisdictions should facilitate the fast tracking of regulatory processes for vital infrastructure investment when considering future major coal infrastructure investment developments including in the context of environmental and community based planning and approval processes.

Summary

Significant sections of the coal supply chain, particularly coal loading terminals and ports, are generally located in or adjacent to environmentally sensitive areas of national significance. Coal transport infrastructure expansion plans and new developments to support the growing coal export industry are likely to trigger a number of government environmental regulatory processes; typically requiring an Environmental Impact Statement (EIS). Development and expansion plans should be submitted to relevant regulatory bodies and government departments well in advance of infrastructure requirements and proposed construction timelines. It is also necessary for governments to facilitate fast tracking these proposals in accordance with relevant environmental planning policies and strategies.

Where construction and development is likely to be impacted by seasonal environmental sensitivities, such as breeding seasons for endangered species, it is imperative that proponents, cooperate with regulatory bodies, to assess the onshore and offshore environmental impacts and build in construction flexibility and early submission of plans to take into account these processes.

Given the lead time for the development of major infrastructure it is often possible for regulatory processes to be factored in to the time scale of the development. A major concern for project proponents - that can and should be addressed by governments - is the uncertainty surrounding the timing of regulatory processes. Reducing slippage and delay in regulatory processes should be a high priority.

To aid the fast tracking of proposals it may also be useful for governments to examine the value of allowing organisations to develop a blanket *'code of practice'* or accepted framework within which specific development projects could be conducted, particularly to reduce duplication that can be associated with the full EIS for each project. It may also be appropriate to consider the relevance of frameworks such as the Mineral Council of Australia's *Enduring Value - the Australian Minerals Industry Framework for Sustainable Development*. The Enduring Value framework builds on the Australian Mineral Industry Code of Environmental Management as the platform for industry's continual improvement in managing environmental issues - in a sustainable development framework.

When developing strategic State and regional planning strategies, governments should be encouraged to take into account the specific needs of valuable export industries. It is imperative that all stakeholders are fully engaged in the development of these strategies, particularly where recommendations coming out of strategies may impact on the ability for industries to export or serve to constrain export growth.

The development of additional infrastructure to meet current and future industry requirements, in the majority of cases, must be approved by a number of government regulatory bodies. Regulatory bodies will:

- grant access to or purchase of additional land,
- ensure the minimisation of environmental impacts on both off-shore and on-shore developments and;
- ensure that developments are in line with Australian, State and local government planning strategies.

7.1 New South Wales

Land - Regulations

The Port Waratah coal terminals at the port of Newcastle faces significant onshore and offshore development constraints. Security of land for existing coal terminals is generally not an issue, however, access to additional land requires many regulatory hurdles to be cleared.

Port Waratah Coal Services leases the land on which their Carrington and Kooragang coal terminals are situated from the NSW Government through the Newcastle Water Board, who governs land use and development issues at the Port of Newcastle. A large part of Kooragang Island abuts a wetlands area bringing additional complexities to the operation on and management of the land. Within the existing facility on Kooragang Island there is potential to further develop and expand the coal terminal and allocation of land at the Port of Newcastle for a third coal terminal would further increase available coal loader capacity.

As part of development plans for the Port of Newcastle, in September 2003, the Regional Land Management Corporation (RMLC) of NSW[27] called for expressions of interest for the development of suitable projects on port related lands on Kooragang Island. Subsequently, comprehensive proposals were called for, including fully developed business cases and applications, which closed in November 2004. One site of particular interest to the coal industry, and where existing rail infrastructure is available, is a pocket of land adjacent to PWCS' Kooragang coal terminal.

Two proponents have been short-listed to develop an up to 60Mtpa third coal loading terminal for the Port. The proponents have now entered into discussions with the rail track manager ARTC on additional rail track needs to service a third terminal. A decision on the allocation of land is due in August 2005, with construction to commence in 2008 and to be completed by 2011. To ensure that the Hunter Valley Coal Supply Chain maximises the capacity of the infrastructure the Senior Officials Group considers that the HVCCLT could be used to provide planning services.

Even with the Hunter Valley Coal Chain Logistic Team's proposed expansion plans to reach a capacity of 120Mtpa by 2011 (Scenario 3, ABARE study), the ARTC draft strategy to increase rail capacity in the Hunter Valley to 140 million tonnes by 2008, or as an alternative, construction of a third coal terminal commencing in 2008 and completed by 2011 (Scenario 4, ABARE study) - on these current schedules these expansion plans are likely to be too late to realise the projected export demand. A possible solution is for the NSW Government to expedite the final decision on the allocation of land at Site D on Kooragang Island for use by the coal industry and the award of the tender. In this event, contract conditions should be put in place to ensure the successful bidder commenced construction in the shortest possible time frame and that clear milestones are set on the project.

Third Coal Loading Terminal

Consideration of the third coal terminal takes into account the uncertainty of the longevity of the Carrington coal terminal. The Carrington coal terminal is situated on Port land with rail lines passing through heavily populated urban areas. The terminal is approaching the end of its life and has no

[27] A government-owned corporation that is a Hunter Water Corporation subsidiary and manages 3339 hectares of the former BHP steelworks and other Crown land sites in the Lower Hunter region.

opportunity to expand capacity from its name plated capacity of 25Mtpa. To realise an increase in coal exporting capacity at Newcastle, infrastructure should be of sufficient capacity to account for a loss of 25Mt per annum from Carrington as well as projected user needs if it were to no longer be used in the future.

The geological structure of the Port of Newcastle is not considered to be a constraint on the export of coal. Currently only two cape-size coal vessels can enter or exit the port per tide and approximately 25 per cent of coal vessels aren't able to load to full capacity (on average they must be under-filled by 10,000t) due to current port draught restrictions. From discussions with stakeholders this is not considered to be a factor limiting the volume of coal exported nor its efficient delivery to customers.

If Australia's customers required mostly cape-size vessels, reducing draught restrictions and/or deepening the port's channel would produce significant benefits to users through more efficient utilisation of vessel capacity, greater flexibility around the tides and reduced freight costs. The global shipping industry is in the process of making major investments in expanding dry bulk shipping capacity. Port development plans need to be responsive to these investment decisions.

The ARTC does not anticipate the need to lease additional land for its proposed capacity expansions to 140Mt per annum nor to service a third coal loading terminal. It is however, unclear what impact on supply chain capacity a third coal loading terminal will have. It is therefore imperative that the successful proponent work closely with the HVCCLT (which includes ARTC) for coordination of rail planning.

Environment - Regulations

The Lower Hunter is widely regarded as containing the most significant and complex migratory wader habitat in New South Wales and the fifth most important in Australia. These significant wetlands and habitats are situated adjacent to a highly urbanised centre in Newcastle. Kooragang Nature Reserve, on Kooragang Island and adjacent to PWCS Kooragang Coal Terminal, is listed as a wetland of International Importance under the Ramsar convention[28].

Of further significance is the Hexham Swamp Nature Reserve, alongside the rail track which transports coal across to Kooragang Island. These areas provide habitat for numerous threatened species listed under the *Threatened Species Conservation Act 1995* (TSC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The two nature reserves (Kooragang and Hexham Swamp) are afforded the highest level of protection due to their status as Nature Reserves, and to their association with agreements such as the Ramsar Convention and JAMBA/CAMBA.

For PWCS' existing coal loading facilities on Kooragang Island, EIS approval is required for expansion beyond 102Mtpa. Given the environmental sensitivity of land abutting the existing Kooragang coal terminal, and the potential slow timeframes as a result, it is imperative that an assessment of environmental impacts of these expansion plans and engagement with relevant regulatory authorities on the development of an EIS to consider proposals for increased capacity.

As part of the Regional Land Management Corporation process for releasing port land, it is understood a blanket EIS covering all sites proposed for development is already in progress to facilitate and fast track the regulatory process. It is expected that any works to be carried out on port land will be covered by this EIS, thus removing the need for development and assessment of individual projects.

NSW has developed a similar fast-tracking approvals process for ARTC. A State Environmental Planning Policy (SEPP) for the ARTC Rail Infrastructure was developed last year under the *Environmental Planning and Assessment Act 1979* (NSW) with the aim of facilitating development of rail infrastructure facilities that are subject to arrangements between ARTC and State rail authorities. A parallel regulation, *Environmental Planning and Assessment Amendment (ARTC Rail Infrastructure) Regulation 2004*, making

28 http://www.planning.nsw.gov.au/index1.html

ARTC a public authority under the Act for the purposes of being able to deal under Part 5 of the Act with activities for the purpose of rail infrastructure facilities permitted without consent of the SEPP, requires ARTC to prepare, and comply with, a code approved by the relevant Minister containing certain requirements for dealing with rail infrastructure activities for which an EIS is not required.

A code of practice provides that development for the purposes of certain rail infrastructure facilities may be carried out without development consent, including construction, maintenance and operation of ARTC facilities; environmental management and pollution control and temporary construction and storage areas.

According to the Regulation, transitional arrangements applied to ARTC until a Code is approved or until the end of six months (or such further period as the Minister may approve) after commencement of the Regulation (3 September 2004). It is understood that ARTC is yet to submit this code of practice: it is imperative that ARTC prepare and apply for approval of a 'code' to the NSW Director-General in a timely manner to facilitate the fast-tracking of environmental approvals rather than the providing individual project applications.

Channel Improvement Project

Before any dredging in the Port of Newcastle occurs as part of the Channel Improvement Project, remediation of contaminated sediment at the former BHP steel works site needs to be completed before a general dredging program can commence. The NSW EPA has classified the contaminated sediments in the South Arm of the Hunter River attributable to the former BHP steel works as posing Significant Risk of Harm under the *Contaminated Land Management Act (1997)*. The NSW Government is currently considering what conditions should be imposed on a general dredging program in the South Arm to facilitate new port projects. Part of that consideration relates to how the contaminated sediments will be dealt with. The timing of these remediation activities is dependent on approvals from the NSW government. It is believed that BHP Billiton has completed all the necessary studies, allocated financial and other resources, and submitted a request for a permit (October 2004) to conduct a pilot remediation trial of 1,000 cubic metres. It is believed that the trial and the assessment of results could be completed within 6 months. The results of the pilot trial would then be incorporated into a further approvals process for the major sediment remediation project to be completed. Once approvals for the major remediation project were granted, the major remediation project, including follow-up testing, could be completed within 15 months.

7.2. Queensland

Land - Regulations

Different issues related to regulatory approvals facing the two coal exporting terminals at the Port of Hay Point. Both the Dalrymple Bay Coal Terminal and the Hay Point Coal Terminal are considered to have sufficient land to accommodate further expansions; however, they operate in a sensitive land-sea interface and maritime environment.

With regards to the Goonyella rail network entering the Port of Hay Point (which carried almost 78Mt coal through to Hay Point in 2004), some coal producers are seeking a full assessment and comparison of the costs and benefits of the development of the missing northern rail link and the upgrade of Abbot Point. While a number of assessments on the need for development of the 'Northern missing link' have been made over time; to this point it has not been considered necessary as the Abbot Point Coal Terminal has minimal spare capacity. However, with the announcement in November 2004 by the Ports Corporation of Queensland of a Master Plan for the development of Abbot Point the need to develop the missing link is enhanced. The Master Plan acknowledges the significant strategic value to the State of the Abbot Point facilities as there are very few locations along Queensland's eastern seaboard where deep water (>15m) is so close in-shore, an essential requirement of fully-laden coal vessels. The enhancement of Abbot Point and the construction of the 'missing link' would offer additional flexibility to divert coal from Hay Point

during times of maintenance and line failures and serve to mitigate the risk of heavy reliance on the existing Goonyella system and the security of large tonnages going through one port.

In March 2005, the QLD Premier approved a feasability study to support the development of the Surat-Dawson Basin the need for extension of track south of Moura to the Port of Gladstone, often referred to as the 'Southern missing link' needs to be on the medium to longer term development agenda for Queensland, and a preliminary assessment of costs and benefits done, including looking at any need to access private land.

Additional coal export capacity gains would be achieved through a comprehensive assessment study on the costs and benefits of developing the track north of Goonyella to link up with Newlands to not only ensure export security, but to provide opportunity for new mines to develop in the northern Bowen Basin. In addition, governments should take early action to access/purchase land corridors required for track extensions as well as land where triplication of the existing line, such as at Black Mountain would be required if the demand for coal exceeds Queensland Rail's plans to expand capacity on the Goonyella system to 140 Mt per annum[29].

Environment - Regulations

The Dalrymple Bay and Hay Point coal terminals are located on the edge of a World Heritage area - the Great Barrier Reef Marine Park - in a setting which includes species protected under the EPBC Act. Future expansion onshore and offshore will need approvals from the Australian Government, Great Barrier Marine Park Authority, the Queensland EPA, the Queensland Coordinator General and the Ports Corporation of Queensland. Any expansion onshore is likely to impact on offshore areas, specifically with regards to dust suppression and noise, as well as an area of ecological significance used as a turtle nesting area by the flatback turtle species which is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*. The beach is designated a low density area, with approximately one to ten females nesting in the area on a yearly basis. The conduct of major works is limited to times outside the breeding season of this species.

Most coal ships entering and departing the Port of Hay Point are constrained by draught to times of high tide. To allow for increased throughput projected at both terminals, through either complete filling, increased number of the larger capesize vessels or additional ships per week, dredging of arrival and departure lanes and additional berths will be required at the port.

At DBCT, there is an *Environment Protection and Biodiversity Conservation Act 2000* approval dated 12 May 2004. This approval permits certain actions under the expansion of DBCT Stages 6 (already completed) and Stage 7, involving the extension of the existing ship berth, installation of a ship loader on this berth extension, dredging of new berth pockets, berth pocket approach and new inner shipping channel, installation of third rail receival system and associated conveyor to the stockyard, three new coal stacking and/or reclaiming machines and associated conveyors, addition of a new coal stockpile row in the stockyard, extension of an existing sea wall and earthworks associated with the project (EPBC 2000/7). While approved, all projects are yet to be completed and expansion of the existing terminal can commence without environmental delay.

In August 2004 Hay Point Services submitted a Coal Terminal Expansion request for approval under the EPBC Act 1999 for expansion of onshore facilities only and therefore not directly impacting on the Great Barrier Reef Marine Park or World Heritage Areas an that while final approval has not yet been granted it is not envisaged that expansion be delayed.

Given the environmental sensitivities and additional time constraints based around breeding seasons at the Port of Hay Point it is essential that these terminal operators work with government regulatory bodies to assess the onshore and offshore environmental impacts on all proposed expansion plans well in advance of

[29] -http://www.qrc.org.au/_files/pdf/publications/submissions/Infrastructure%20requirements_final.pdf

proposed construction timeline. It is also essential that governments facilitate the fast-tracking of environmental processes to enable investment in infrastructure occurs in line with industry requirements and does not impede export growth.

Dredging of Port of Gladstone

The Gladstone Port Authority (GPA) has commenced planning for future infrastructure needs. Dredging of the channel would be required to open up the port for significant new coal capacity. The exact nature and volume of dredging required will be determined following the completion of a port capacity study which has been commissioned by the Central Queensland Port Authority in the new few months.

8. International Communication Strategy

Strategy

Implement an international communications strategy to be undertaken by the Australian Government to ensure overseas markets are fully aware of measures being taken to address coal transport requirements and confirm Australia's status as a reliable supplier of coal.

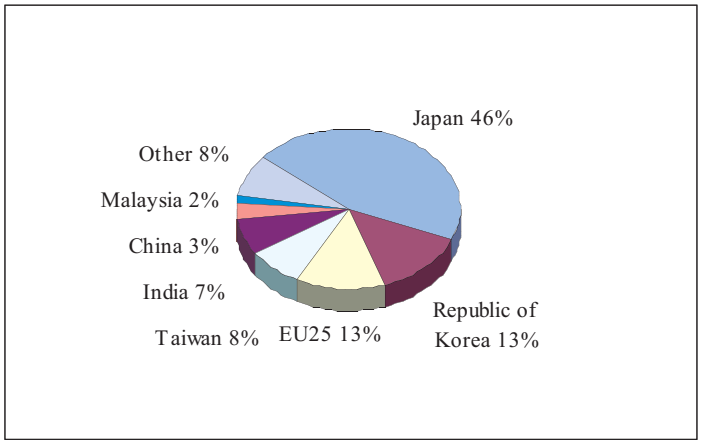
Summary

An international communication strategy and associated plan of action are essential to reassure Australian coal export destination countries' governments and key customers that Australia remains a secure, reliable and competitive supplier to the world coal market. A communication strategy will ensure open lines of communication between all interested parties to raise awareness of the current infrastructure situation in Australia and provide a mechanism for receiving feedback and respond to stakeholder queries.

Worldwide, coal producers and infrastructure providers were caught unaware by the strong increase in demand for resources in 2004. Whilst production capacity and infrastructure are being expanded in Australia, the market will remain tight over the next two years.

Messages regarding the reliability and secure nature of the Australian coal market and infrastructure developments need to be communicated to relevant overseas Governments, industry associations and key customers (major steel, power generating) and shipping companies) and Australian coal marketers in traditional and emerging markets such as Japan, Europe, Korea, Chinese Taipei, India, Mexico and China (where over 70 per cent of the coal produced in Australia is exported). In addition, the Trade Liaison Committee representing Australian coal producers, and key shipping agents and coal agents in Australia should also be informed of infrastructure issues and developments.

Diagram 10 : Australia's major coal customers in 2004



2004	
Country	Quantity ('000 tonnes)
Japan	101,942
Republic of Korea	29,861
Europe	28,683
Chinese Taipei	18,545
India	16,593
China	6,457
Malaysia	3,491
Other	19,084

Source: Australian Government Trade Data 2004

Coal is an important export commodity for Australia which also underpins important bilateral collaboration on a range of policy issues, energy security and research and development on clean coal technologies. Extended delays in coal shipments and visible bottlenecks in Australia's coal transport infrastructure chains have been raised as a concern by the key coal export markets of Japan, Korea, China and Chinese Taipei during bilateral Government high level official meetings.

While individual coal producers manage contractual relations with their customers, there is a need for Governments to be proactive in confirming Australia's international reputation as a secure and reliable exporter of high quality coals. The Australian Government has a role in communicating to our major customers, and relevant stakeholders, the measures that are being taken to address infrastructure constraints.

It is necessary for the Government to regularly update key customers, government agencies and industry associations on progress in the implementation of measures, development of capacity along our supply chains and government policy updates related to the coal industry and infrastructure.

Appendix 2 details an International Communication Action Plan.

Appendices

Appendix 1 New South Wales and Queensland Coal Industry Profiles

Appendix 2 International Communication Action Plan

Appendix 3
- a. Terms of Reference for Senior Officials Group
- b. Abbreviations
- c. Glossary

Appendix 4 Stakeholder Consultations

Appendix 5 ABARE Report - *Infrastructure Issues in the Hunter Valley Coal Supply Chain*

NEW SOUTH WALES AND QUEENSLAND INDUSTRY PROFILES

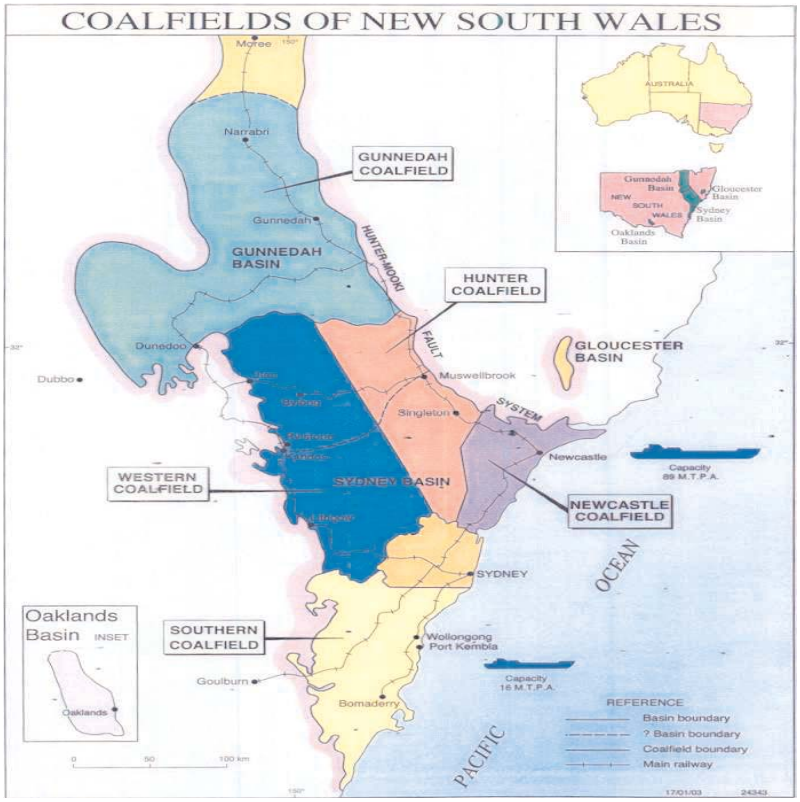
New South Wales

Coal Mines

There are seven defined coal fields in New South Wales (NSW): Hunter; Newcastle; Southern; Western; Gunnedah; Oaklands; and, Gloucester as seen in Figure 1; with the Hunter Coal Field accounting for around 45 per cent of the recoverable reserves (including only that coal contained in mine leases or exploration licences for which at least conceptual mine planning studies have been undertaken).[30]

Recoverable coal reserves in this State total approximately 8,732 million tonnes (Mt).[31] These reserves are contained within 56 operating mines and colliery holdings and 36 major development proposals. The coal deposits range in rank from bituminous coking and thermal coals to sub-bituminous thermal coals. The quality of thermal coals ranges from medium to high ash, low sulphur coal used for domestic power generation and cement manufacture; to medium to low ash, high energy, export quality coal. Prime, low volatile, hard coking coal and low ash, semi-soft coking coal, used for iron and steel production, supply both the export and domestic markets.

Diagram 11: Map of New South Wales Coalfields



Source: New South Wales Coal Industry Profile (2004)

30 New South Wales Coal Industry Profile (2004) http://www.minerals.nsw.gov.au

31 New South Wales Coal Industry Profile (2004) http://www.minerals.nsw.gov.au

Production Capacity

Although the number of mining operations and employment in NSW has decreased prior to 2000, numbers have remained stable in recent years with an increase in the volume of coal production. Production has increased due to a higher ratio of saleable to raw production. Over the past decade production has increased by 92 per cent. Demand for high quality coal, both thermal and metallurgical has increased dramatically since 2002-03[32]. Mines typically have the flexibility within their overall capacity to adjust production in response to changes in market conditions. This would normally be done in the context of developing annual mining plans and operations over the coming 12-18 months to achieve a production target. Disruptions in production, however, can mean that targets are not met and excess production is difficult to achieve. Hunter Valley coal mines exporting through the Port of Newcastle is at Diagram 12.

Hunter Valley

Diagram 12: Hunter Valley Coal Mines Exporting Through the Port of Newcastle

Mine name	Owner	Operator
Ashton	White Mining (80%) Itochu Corporation (20%)	Ashton Coal Operations Ltd
Awaba	Centennial Coal Company Limited	Centennial Newstan Pty Ltd
Beltana	Saxonvale Coal Pty Ltd (87.5%) (**Xstrata**) Nippon Steel Australia Pty Ltd (12.5%)	Bulga Coal Management Pty Ltd
Bengalla	CNA Bengalla Investments (40%)(**Rio Tinto**) Wesfarmers Bengall Ltd (40%) Taipower Bengalla Pty Ltd (10%) Mitsui Bengalla Investment Pty Ltd (10%)	Bengalla Mining Company Pty Limited
Bickham	Bickham Coal Company Pty Ltd	Bickham Coal Company Pty Ltd
Bloomfield	Big Ben Holdings Pty Ltd	Bloomfield Collieries Pty Ltd
Bulga	Saxonvale Coal Pty Ltd (87.5%)(**Xstrata**) Nippon Steel Australia Pty Ltd (12.5%)	Bulga Coal Management Pty Ltd
Camberwell	Navidale Pty Ltd (50%) Toyoto Tsusho Mining (Aust) Pty Ltd (40%) Dia Coal Mining (Aust) Pty Ltd (10%)	Camberwell Coal Pty Limited
Chain Valley	Lake Coal Pty Ltd (80%) (**Excel**) Catherine Hill Resources Pty Ltd (20%)	Lake Coal Pty Ltd
Cumnock No. 1	Cumnock Coal Ltd (**Xstrata**)	Cumnock No. 1 Colliery Pty Ltd
Cumnock South	Cumnock Coal Ltd (**Xstrata**)	Cumnock No. 1 Colliery Pty Ltd
Dartbrook	Anglo (Dartbrook) Coal Pty Limited (77.5%) Marubeni Thermal Coal Pty Ltd (15.5) SsangYong Resources Pty Ltd (7%)	Dartbrook Coal
Donaldson	Donaldson Coal Pty Limited	Donaldson Coal
Drayton	Anglo Coal (Drayton) (74.75%) Anglo Coal (Drayton) No.2 Pty Ltd (13.42%) Mitsui Drayton Investment Pty Ltd (3.83%) Mitsui Mining Australia Pty Ltd (3%) Hyundai Australia Pty Ltd (2.5%) Daesung Australia Pty Ltd (2.5%)	Anglo Coal (Drayton Management) Pty Ltd
Duralie	Gloucester Coal Limited	Duralie Coal Pty Ltd
Glennies Creek	AMCI	Namoi Hunter Pty Ltd
Hunter Valley Operations	Rio Tinto Coal Australia	Rio Tinto Coal Asutralia
Liddell	Enex Liddell Pty Ltd (35%) (**Xstrata**) Gaburne Pty Ltd (32.5%) (**Xstrata**) Mitsui Matsushima Australia Pty Ltd (32.5%)	Liddell Coal Operations Pty Ltd

32 Latest data from NSW Coal Industry Profile (2004) http://www.minerals.nsw.gov.au

Mine name	Owner	Operator
Moonee	Lake Coal Pty Ltd (80%) (Excel) Catherine Hill Resources Pty Ltd (20%)	Lake Coal Pty Ltd
Mt Arthur Coal	Hunter Valley Energy Coal Ltd (**BHPBilliton**)	Mount Arthur Coal Pty Ltd (BHPBilliton)
Mt Owen	Xstrata Coal (Australia) Pty Ltd	Hunter Valley Coal Corporation Pty Ltd
Mt Thorley	Rio Tinto Coal Australia Posco Australia Pty Limited	Mount Thorley Operations Pty Ltd
Munmorah*	Centennial Coal Company Limited	Centennial Munmorah Pty Ltd
Muswellbrook No. 2	Apollo Resources/Idemitsu Kosan Co. Ltd	Muswellbrook Coal Company Ltd
Myuna	Centennial Coal Company Limited	Centennial Myuna Pty Ltd
Newpac No. 1 (formerly Nardell)	Private ownership	Newpac Pty Ltd
Newstan	Centennial Coal Company Limited	Centennial Newstan Pty Ltd
Ravensworth*	Ravensworth Operations Pty Ltd (**Xstrata**)	Ravensworth Operations Pty Ltd
Rix's Creek	Big Ben Holdings Pty Ltd	Rix's Creek Collieries Pty Ltd
South Bulga	Saxonvale Coal Pty Ltd (87.5%) (**Xstrata**) Nippon Steel Australia Pty Ltd (12.5%)	Bulga Coal Management Pty Ltd
Stratford	Gloucester Coal (90%) ICA Coal Pty Ltd (10%)	Stratford Coal Pty Ltd
Teralba	Enex Resources Limited (**Xstrata**) Marubeni Corporation Kokan Kogyo	Teralba Coal Pty Ltd
Ulan	Jonsha Pty Limited (90%) (**Xstrata**) Mitsubishi Developments Pty Ltd (10%)	Ulan Coal Mines Ltd
United	Abelshore Pty Ltd (95%) (**Xstrata**) CFMEU (5%)	United Collieries Pty Ltd
Wambo	Hunter Coal Pty Ltd (75%) (**Excel**) Sumitomo Coal Mining Ltd (25%)	Wambo Coal Pty Ltd
Warkworth	CNAWarkworth Australasia Pty Ltd (55.5%) Mitsubishi Development Pty Ltd (29%) Nippon Steel (Aust) Pty Ltd (9.5%) Mitsubishi Materials (Aust) Pty Ltd (6%)	Warkworth Mining Ltd
West Wallsend Westside*	Oceanic Coal Australia Ltd (70%) (**Xstrata**) Marubeni Coal Pty Ltd (17%) OCAL Macquarie Pty Ltd (10%) Kokan Kogyo (Aust) Pty Ltd (3%)	Oceanic Coal Australia Limited (Xstrata)
Whitehaven	Private ownership	Whitehaven Coal Mining Limited

Note: Names **bolded** and in brackets identifies ownership by a major coal producing company

Source: Derived from the NSW Coal Industry Profile (2004) http://www.minerals.nse.gov.au

Mine Expansion Plans

The majority of coal producers in the Hunter Valley have plans to expand their operations over the next ten years. Plans range from expanding existing mine capacity (brownfield) through to the development of new reserves (greenfield). Coal producers indicated that they would be developing 48Mt of brownfield capacity and 67Mt of greenfield capacity. Market conditions would determine when and how these expansions occur. Many coal producers indicated that constraints on the volume of coal that can be exported through the Port of Newcastle may limit future expansion plans.

Rail Track

Coal is transported in large volume across short distances from load points generally ranging from 20km to 320km from the Port. The major coal mining areas of NSW are close to the main ports and industrial

centres of Newcastle, Sydney and Wollongong. The most common methods of transporting coal in NSW are rail and road with rail being by far the most important and efficient method of transport, particularly for coal destined for export. In the next few years, haulage by rail of domestic coal will also need to expand to support delivery from mines located away from existing coal fired power stations.

The Hunter Valley Rail Freight network, which is dominated by the coal industry, consists of the track from the two coal terminals operated by PWCS at the Port of Newcastle to Werris Creek in the north and Ulan via Muswellbrook; a section of 452km of track and signalling.

On September 2004, ARTC assumed the lease of the NSW interstate and Hunter Valley networks for 60 years.

The coal industry shares the track primarily with passenger trains and seasonal grain trains which can cause logistic complications. Haulage cycle times vary from 22.4 hours (Ulan) to 6.25 hours (Teralba). There is one line to the two coal terminals (Carrington and Kooragang) which have five dump stations and seven stockpile pads. Rail transport carries over 99 per cent of all the Hunter Valley coal moved into PWCS terminals. Kooragang receives coal exclusively via the rail network and Carrington can receive coal from rail and road.

There are also four domestic unload points (Macquarie Generation, Eraring, Ulan and Bells Point). Rail haulage of domestic coal is not impacting on the export coal market at present, however Macquarie Generation is going out to tender to rail all of its coal (8-10 million tonnes per annum rather than transport on conveyors. This will impact on export capacity from 2007. It is also likely that when domestic coal resources located near power stations are depleted rail transport will become a necessity in the near future.

Some sections of the track have considerably steep grades which reduce the speed of the train and increases the haulage time. These severe grades are a major impediment to the efficient and timely haulage of coal.

There are a finite number of pathways available to coal transport per day; with the steepness of some sections of the track and the increased haulage time presenting a bottleneck delaying movement, a number of these haulage opportunities are not realised, thereby reducing the capacity to deliver coal to the Port. In addition, passenger trains, receive priority access ahead of coal trains.

ARTC and the coal industry are looking to increase the speed of coal trains to 80km/hr from 60km/hr, inline with all other users of the track, to minimise lost pathways.

DIAGRAM 13: Hunter Valley Rail Corridor

	Hunter Valley Coal Network
Track Name	• The Hunter Valley Coal Network services the coal mines of the Hunter Valley, Ulan, central coast and Gunnedah basin regions of New South Wales. • The Port of Newcastle contains two coal unloading facilities at Carrington /Port Waratah (167km) and Kooragang Island (177km) . • The Hunter Valley network consists of a double track section from the ports to Antienne (274.3km) and single line sections to Ulan (435km). • Another single line section from Muswellbrook (288 km) to Whitehaven (480.2km). Coal trains utilise the North Coast railway line from Maitland (193km) to Stratford (291.65km). • The single line South Maitland Railway commences at Maitland (193.0km) and extends to Pelton Junction. • The Mt Thorley branch line is a si ngle line which commences at Whittingham (234.2km) and extends to Mt Thorley (243.5km). The Saxonvale branch line exists the Mt Thorley branch line at Saxonvale ((241.9km) and extends to Bulga loop. • The Newdell branch line is predominantly a single track w hich interfaces with the main north at Newdell junction (262.3km). • The Drayton's branch line is a single track branch line which interfaces the main north at Drayton's junction (272km). The Mt Arthur spur line connects to the Drayton branch line at ~ 279km . • The Teralba and Newstan balloon loops interface with the Sydney to Newcastle main line (double track) which is part of the Railcorp metropolitan network.
Gauge	• 1435mm standard gauge railway
Balloon Loops	• Balloon loading loops interface the main norther n railway line at Bloomfield (182.495km), Camberwell/Rix's Creek (246.9km), Mt Owen (253.9km), Ravensworth (262.3km), Dartbrook (296.7km) and Whitehaven (480.2km) . • The South Maitland Railway which services the Southland mine interfaces the main north line at 193.0 km • Balloon loading loops which interface the Mt Thorley branch line are located at Bulga (241.9km) and Mt Thorley/Warkworth (243.5km) • The Newdell balloon loading loop which services Newdell, Liddell and Hunter Valley No 1 mines interfaces the New dell branch line at 265 km • The Drayton's balloon loading loop interfaces with the Drayton's branch line at (272.0 km). The Mt Arthur North balloon loop is located of the privately owned Drayton spur line. • On the Muswellbrook to Gulgong line the Bengalla balloon loop interfaces at 294.1km and the Ulan balloon loop at 436km. • On the north coast line a balloon loop servicing the Stratford mine is located at 291.65km as well as a coal loading siding at Duralie 272.8km • There are also two balloon loops on the central coast at Teralba (148km) and Newstan (142.6km) . • Please note all kilometr es have Sydney as the origin ie 0 km.
Power source	• The Hunter Valley system is not electrified.
Track Length	• The network consists of 661 track kilometres and 548 route kilome tres.
Speed Allowed	• 100 tonne wagons (25t axle load) are permitted to run at 80 km/hr loaded and the 120 tonne wagons (30t axle load) at 60 km/hr loaded. • General freight (23t) at up to 110km/hr and passenger services at up to 140 km/hr also traverse the n etwork.

Weight Ratio (kg/m)	• The majority of the network consists of 60 kg/m rail on concrete sleepers. • The track servicing the Whitehaven mine in the Gunnedah basin is 53 kg/m rail on timber sleepers.
Operated by (remote signalling etc)	• The signalling of the Hunt er Valley consists of a wide ranging mix of signal boxes and remote control systems. • The Newcastle to Branxton section consists generally of a mixture of mechanical and electrical signal boxes controlling mechanical and electrical points and coloured light signals. • The Branxton to Muswellbrook area is remote controlled from the Broadmeadow control centre with interlockings both relay and electronic. • The Muswellbrook to Gulgong section employs electric staff working. • A single line centralised train control s ystem operated between Muswellbrook and Werris Creek.
Interfaces	• Operators on the Hunter Valley network encounter 220 rail/road interfaces - Public (with flashing light protection) 10 - Public (with passive protection – signs) 37 - Occupation (privat e access) 173

Source: DOTARS

Rail Freight Operators

Pacific National, a company jointly owned by Toll Holdings Limited and Patrick Corporation, deploys a fleet of 38 trains consisting of 2,634 coal wagons and 107 locomotives to deliver coal in NSW. These trains have individual carrying capacities ranging between 2,100 and 8,600 net tonnes with a total annual capacity in excess of 90mtpa. The largest trains in NSW consist of 80x120 gross tonne wagons (9,600tonne).[35] Pacific National indicated that the major Hunter Valley coal loading terminals are capable of loading trains up to 91 wagons in length, however some rail receival points can only accommodate trains of 40-50 wagons in length.

Rail contracts pick up the loading variation at load points but there are currently no penalties incurred by owners of coal loaders that have inefficient operating practices which cause system capacity delays and hold up the throughput of coal to the Port. As a result there is currently a trade off between a fully loaded train departing a coal loader and the time it takes to load, with some trains departing short of a full load. Pacific National currently operates their trains spending a minimal time stopped (loading/unloading).

Rail Infrastructure Capacity Expansion Plans

The ARTC has announced a five year $152 million Hunter Valley capital investment program and has just finalised its Hunter Valley rail strategy. A further $109 million was also announced under the Australian Government's AusLink Land Transport Plan for weeks which will help ease congestion of freight and coal train movements on northern approaches to Maitland in the Hunter Valley. This work will enable the coal industry to support forecast increases in coal production and exports in the medium to long term.

Following grading of some sections of the track, the major rail operator Pacific National is expected to return to running larger train consists of around 80 wagons (9,600 tonne), from the currently operated approximately 53 wagon (5,000t) trains. In addition, by third quarter 2005 Pacific National will deliver a further two trains that will each operate on an average two coal paths per day.

In 2005, QR will also be responsible for hauling around 12Mtpa of coal in the Hunter region, representing around 12 per cent of the total freight haul in NSW, and will commence operations with the delivery of 4 trains running on an average two coal paths per day. Within two years QR may increase their haulage commitment in NSW to approximately 25 per cent.

Coal Infrastructure Coordination Group

Hunter Valley Coal Chain Logistics Team

The Hunter Valley Coal Chain Logistics Team (HVCCLT) essentially acts as one manager who has responsibility to act in the interest of the entire coal chain to increase transport chain efficiency through improved scheduling practices and train productivity, optimising the rail network and maximising stockpiles and throughput at the export ports. The Team is guided by one representative from each of the following organisations: Pacific National; PWCS; Rail Corp; Queensland Rail; ARTC; and the Newcastle Port Corporation (NPC). This Team runs the daily operation of the Hunter Valley coal supply chain.

Ports and Coal Terminals

Port of Newcastle

The Port of Newcastle (Port Waratah) is the largest coal handling port in NSW. The port serves the Hunter, Newcastle and Gunnedah Coalfields and the Ulan mine in the Western Coalfield, through two coal ship loading terminals. The Port of Newcastle is owned and operated by the NPC which was established as a NSW Statutory State Owned Corporation in July 1995, under the *Ports Corporatisation and Waterways Management Act 1995*. Port land on Kooragang Island is owned by the State through the Newcastle Water Board who governs land use and development issues; long-term leases are awarded to various industry sectors. A large part of the Island area is next to a wetlands area bringing additional complexities to the operation on, and management of, the land.

Port Waratah Coal Terminal Infrastructure

Ownership/Operation

At the Port of Newcastle, PWCS owns and operates two coal loading terminals (Carrington and Kooragang). Currently, PWCS is owned by a number of coal producers with different respective shares (70 per cent) and other participants (30 per cent, mainly representing coal importers) in the Hunter Valley coal industry. Of the coal exported through Newcastle, approximately 77 per cent is thermal coal and 23 per cent is soft coking coal.

PWCS leases the land on which the coal terminals are situated from the NSW Government under an agreement which states that the Port is to be maintained as a 'common user facility'. Any party who wishes to use the port to load coal may do so, provided they sign a Coal Handling Services Agreement (CHSA). The CHSA sets out the terms on which PWCS will provide a user with coal handling services including the receiving and unloading of coal, storage of coal and the loading of coal onto vessels for export. PWCS has an agreed set price for coal handling services and all users pay a standard loading fee which is set to cover capital and operational costs. PWCS have identified what they believe to be the most efficient means to operate the port with the aim to have eight assembled cargoes for export, at any one time loading four vessels with four cargoes assembled for the next vessels in the queue. However, users do not pay penalties or premiums for diversions from PWCS' operating structure.

The loading fee, or Transport Infrastructure Charge[33], is fixed at a rate of $2.70 per tonne regardless of the coal handling service required. For instance, a producer may require a stockpile to be built from trains with different coals or ships loaded with coals from different stockpiles or mines or directly from trains. Large stockpiles take longer to assemble, particularly from smaller mines, and this has the effect of constraining available stockpile for other users.

[33] This Transport Infrastructure Charge is the average of the cost to load coal at Carrington and Kooragang.

Terminal Capacity

PWCS have the capacity to blend coal from all over the Hunter Valley to meet customer requirements prior to shipment. New computer controlled rail scheduling and coal stacking and reclaiming facilities can accommodate some 150 different export coal blends from the Hunter and Western Coalfields. Specifications of Carrington and Kooragang coal terminals are in Diagram 14.

In the period from 1994-2002, PWCS invested $700 million to expand the capacity of the Kooragang terminal to 64Mtpa, which combined with Carrington with a capacity of 25Mtpa, resulted in a rated capacity of 89Mtpa for PWCS with a declared operating capacity for 2005 of 84.3Mpta.

Diagram 14: The Port of Newcastle

	Kooragang Coal Terminal	Carrington Coal Terminal
Overview	▪ Located on 160 hectares of land on Kooragang Island ▪ Operations commenced in 1984 ▪ Owned and operated by Port Waratah Coal Services Limited ▪ Common user facility ▪ Nameplate throughput capacity - 64Mtpa ▪ Expansion plans – additional stockyard capacity, additional rail receival capacity and additional shiploading capacity	▪ Located on 40 hectares in Newcastle ▪ Operations commence 1976 ▪ Owned and operated by Port Waratah Coal Services Limited ▪ Common user facility ▪ Nameplate throughput capacity - 25Mtpa
Coal Receival	▪ Three rail receival facilities located on the northern edge of the terminal ▪ 2 x 6,600 tonnes per hour (tph) rail capacity ▪ Average distance from mine - 107 km (75-139 km)	▪ 1 x 4,400 x 1 x 4,600tph rail capacity ▪ 1 x 2,500tph road capacity ▪ 1 x 2,500tph vessel capacity ▪ Average distance from mine - 107 km (75-139 km)
Coal Stockpiles	▪ 3 stockpile rows ▪ 2 x 2.5 km x 56 m ▪ 1 x 1.0 km x 56 m ▪ 3 million tonnes (Mt) max capacity ▪ 2.4Mt working capacity ▪ 4 x 6,000tph stacking capacity	▪ 4 x 1,000 m x 40 m ▪ 1Mt max capacity ▪ 0.5Mt working capacity ▪ 4 x 2,500tph stacking capacity
Coal Loading	▪ Conveyor systems - 2.0-3.2 m wide, 5.0-5.5 m/sec conveyor belts ▪ 3 x 8,000tph reclaiming capacity ▪ 3 x 10,500tph shiploading capacity	▪ 4 x 2,500tph reclaiming capacity ▪ 3 shiploaders ▪ 2 max number of shiploaders per vessel with 2,500tph shiploading capacity ▪ 1.4-2.4 m wide, 2.75 -5.0 m/sec conveyor belts
Berths	▪ Berth space for 3 vessels ▪ 16.5 m depth at each berth ▪ 15.2 m approach to channel	▪ Berth space for 2 vessels ▪ Loaded simultaneously (with one shiploader at each berth ▪ 16.5 m depth at berth ▪ 15.2 m approach to channel
Vessel Capacity	▪ 3 capesize vessels up to 232,000 dwt max ▪ 40,000 dwt min capacity ▪ 300 m max length ▪ 50 m max beam	▪ 20,000 dwt min capacity ▪ 180,000 dwt max ▪ 290 m max length ▪ 47 m max beam

Source: Table derived from information on the PWCS website at http://www.pwcs.com.au

The Port of Wollongong - Port Kembla

Port Kembla at Wollongong services mines in the Gunnedah, Gloucester and Oaklands coalfields in the Illawara and Blue Mountains. The coal terminal is owned and operated by Port Kembla Coal Terminal Limited - a consortium of six coal companies each owning a 1/6 share of the terminal. Specifications of the Port Kembla Coal Terminal are in Diagram 15.

Port Kembla handles a much smaller proportion of NSW export coal and the significant costs and congestion of getting through the Sydney metropolitan rail network make shifting coal from the Hunter Valley coal producers down to this port to utilise unrealised terminal capacity is considered to be uneconomic at this stage.

Diagram 15: The Port of Wollongong - Port Kembla

	Port Kembla Coal Terminal
Overview	▪ Outer Harbour of Port Kembla took shape from 1898 -1925 ▪ Inner Harbour was excavated and formed from 1955 -1965 ▪ Government owned ▪ Operated by Port Kembla Coal Terminal Limited ▪ Common user facility ▪ Nameplate throughput capacity – 16 Mtpa ▪ Services around 10 mines from the Southern Coalfields ▪ Ongoing improvement program to ensure average vessel tu rnaround times remain below two days at the coal berth
Coal Receival	▪ Rail receival ▪ Average distance from mine - 65.5 km (14 -117 km)
Coal Stockpiles	▪ 0.85Mt capacity
Coal Loading	▪ 2 x 5,000tph shiploading capacity
Berths	▪ Berth space for two vessels ▪ 16.25 m depth at coal berth ▪ 15.25 m approach to channel
Vessel Capacity	▪ 25,000 dwt min capacity ▪ 180,000 dwt max capacity ▪ 315m max length ▪ 55 m max beam ▪ Capesize vessels berthed and loaded simultaneously

Coal Terminal Expansion Plans

Newcastle Coal Terminal

Plans are currently being considered to expand PWCS from a nominal ship loading capacity of 89Mtpa to 102Mtpa over a four year period. It is expected that these expansions will be completed in December 2007. The Carrington coal terminal is situated on Port land. The land is leased from the NSW Government and its ongoing operation is continually debated. There is no opportunity to expand the capacity of the terminal. For PWCS to increase the combined capacity of their coal terminals, expansion can only occur at Kooragang. A number of improvements in the short- to medium-term are scheduled for PWCS and, along with the completion of Stage 3 at Kooragang, which already has approval, will see a port terminal capacity of 102Mtpa realised. PWCS are considering future capacity expansion options.

There is also the potential for a third coal terminal to be developed at the Port of Newcastle. One site of particular interest to the coal industry is a pocket of land adjacent to PWCS' Kooragang terminal. Expressions of interest for the development of projects on port related lands on Kooragang Island have been assessed by the NSW Government and two preferred proponents have been announced with a final announcement being made in August 2005. Construction is expected to commence in 2008 for a three year period.

Port Expansion Plans

Approximately 25 per cent of vessels that frequent the port aren't able to load to full capacity due to current draft restrictions. Reducing draft restrictions for these deeply laden vessels is expected to produce significant benefits to Port customers through more efficient utilisation of vessel capacity and hence, reduced freight costs. Although not considered to be a constraint on the current export of coal, discussions on increasing the capacity of the Port of Newcastle are occurring. The NPC has a Newcastle Channel Improvement Project which involves the deepening and potentially widening of the port's principal navigation channels. The project cost is yet to be defined but is expected to range from $30 million for primary stage blasting to over $100 million for significant deepening of the whole port. The scale of the

project will be determined shortly, subject to discussions with port customers with construction not likely to commence until 2005.

Queensland

Coal Mines

There are a number of coal producing areas in Queensland, the majority are located in the Bowen Basin of central Queensland (see map) close to the main ports and industrial centres of Brisbane, Gladstone, Mackay and Rockhampton and supply about 85 per cent of the State's export coking and thermal coals. The remainder are located in the south-east of the state in the Moreton, Tarong, Callide and Surat basins provide the remaining production for both domestic and export markets. Of emerging importance is the Surat Basin extending through central Queensland.

During 2002-03, coal was produced from 44 mines: 32 open-cut and 12 underground mines. The Queensland coal industry employed 10,713 in 2002-03 and is the largest export earner for Queensland with the value of sales amounting to A$7.98 billion 'free on board'.

Queensland's coal industry has entered a mature stage of development and while some operations have the capacity to ramp up production to meet future demand, other mine operators will need to begin the development of new projects to enable existing sales volumes to be maintained.

Diagram 16: Map of Queensland Coalfields

Source: Queensland Government Department of Natural Resources and Mines.

Production Capacity

The Queensland coal industry continues to expand, and during fiscal 2002-03[34] achieved record production levels and export and domestic sales. Mines produced 153.6Mtpa of saleable coal, an increase of 3.5 per cent over the previous financial year. This production included approximately 84.8Mtpa of coking coal and 68.7Mtpa of thermal coal (opencut operations contributed 126.4Mtpa and underground operations produced 27.3Mtpa).

Queensland maintained its position in 2002-03 as the world's largest exporter of seaborne coal with over 80 per cent or 129.2Mtpa of production was exported to 35 countries, an increase of 5 per cent on the previous year and consisting of 86.9Mtpa of coking coal for steel and iron production and 42.3Mtpa of thermal coal for power generation. Diagram 17 provides detail on the mines of the Bowen Basin which supplies the vast majority of the State's export coking and thermal coals.

[34] Latest available public data from the Queensland Coal Industry Overview 2002-03, 52nd Edition , 2004 publication of the Queensland Department of Natural Resources and Mines http://www.nrm.qld.gov.au/mines/coal/publication_list.html#QCIR

Diagram 17: Bowen Basin Mines, Owners, Operators and Export Port

Mine name	Owner	Operator	Port name
Blackwater	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Gladstone
Blair Athol	Rio Tinto Aust Pty Ltd (71.24%) UniSuper Ltd (15.39%) EPDC (Aust) Pty Ltd (9.95%) JCD Aust Pty Ltd (3.42%)	Rio Tinto Coal Australia Pty Ltd	Hay Point
Burton	Peabody Energy Aust Coal Pty Ltd (95%) Thiess Investments Pty Ltd (5%)	Burton Coal Pty Ltd	Hay Point
Callide	Anglo Coal Holdings Aust Ltd	Anglo Coal (Callide Management) Pty Ltd	Gladstone
Collinsville	Xstrata Coal Qld Pty Ltd (55%) Itochu Coal Resources Aust Pty Ltd (25%) ICRA NCA Pty Ltd (10%) Sumisho Coal Aust Pty Ltd (10%)	Collinsville Coal Company Pty Ltd	Abbot Point
Commodore	InterGen (26.85%) China Huaneng Group (26.85%) Marubeni Corp (30%) GE Structured Finance (6.3%) Energy Investors Fund (5%) Tohoku Electric Power Co (5%)	Millmerran Operating Company Pty Ltd	Brisbane
Cook	Xstrata Coal Aust Ltd (95%) Tokyo Boeki Aust Pty Ltd (5%)	Cook Resource Mining Pty Ltd	Gladstone
Coppabella	Macarthur Coal Ltd (73.3%) CITIC Aust Coppabella Pty Ltd (7%) Marubeni Corp (7%) Sojitz Corp (7%) Kawasho Corp (3.7%) Nippon Steel Trading Co Ltd (2%)	Aust Premium Coals Pty Ltd	Hay Point
Crinum	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Gladstone
Curragh	Wesfarmers Ltd	Curragh Qld Mining Pty Ltd	Gladstone
Ensham	Idemitsu Qld Pty Ltd (37.5%) Bligh Coal Ltd (47.5%) EPDC (Aust) Pty Ltd (10%) LG International (Aust) Pty Ltd (5%)	Ensham Resources Pty Ltd	Gladstone
Foxleigh	CAML Resources Pty Ltd (63%) ICRA Foxleigh Pty Ltd (20.6%) Bowen Basin Investments Pty Ltd (16.4%)	Foxleigh Mining Pty Ltd	Hay Point
German Creek German Creek East	*Underground mines* Anglo Coal Pty Ltd and Jena Pty Ltd (70%) Mitsui German Creek Investment Pty Ltd (30%) *Open-cut mine* Anglo Coal (86.36%) Marubeni Coal Pty Ltd (13.64%)	Anglo Coal (Capcoal Management) Pty Ltd	Hay Point
Goonyella	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Hay Point
Gregory	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Gladstone
Hail Creek	Qld Coal Pty Ltd (92%) Marubeni Coal Pty Ltd (5.33%) Sumitomo Corp (2.67%)	Rio Tinto Coal Aust Pty Ltd	Hay Point
Jeebropilly	New Hope Corp Ltd	New Hope Coal Australia	Brisbane

Mine name	Owner	Operator	Port name
Jellinbah East	Qld Coal Mine Management Pty Ltd (70%) Marubeni Coal Pty Ltd (15%) Catherine Hill Resources Pty Ltd (15%)	Jellinbah Mining Pty Ltd	Gladstone
Kestrel	Qld Coal Pty Ltd (80%) Mitsui Kestrel Coal Investment Pty Ltd (20%)	Rio Tinto Coal Aust Pty Ltd	Gladstone
Meandu	Rio Tinto Coal Aust Pty Ltd	Rio Tinto Coal Aust Pty Ltd	N/A
Moorvale	Macarthur Coal Ltd (73.3%) CITIC Aus Coppabella Pty Ltd (7%) Marubeni Corp (7%) Sojitz Corp (7%) Kawasho Corp (3.7%) NS Trading Co Ltd (2%)	Aust Premium Coals Pty Ltd	Hay Point
Moranbah North	Moranbah Nth Coal Pty Ltd (87%) Moranbah Nth Coal No 2 Pty Ltd (1%) Nippon Steel Aust Pty Ltd (5%) NS Resources Aust Pty Ltd (1.25%) Mitsui Moranbah Nth Investment Pty Ltd (4.75%) Kokan Kogyo Pty Ltd (0.5%) Shinsho Aust Pty Ltd (0.5%)	Anglo Coal (Moranbah North Management) Pty Ltd	Hay Point
Moura	Anglo Coal (Moura) Pty Ltd (51%) Mitsui Moura Investment Pty Ltd (49%)	Anglo Coal (Moura Management) Pty Ltd	Gladstone
New Acland	New Hope Corp Ltd	New Hope Coal Australia	Brisbane
New Oakleigh	New Hope Corp Ltd	New Hope Coal Australia	Brisbane
Newlands	Xstrata Coal Qld Pty Ltd (55%) Itochu Coal Resources Aust Pty Ltd (25%) ICRA NCA Pty Ltd (10%) Sumisho Coal Aust Pty Ltd (10%)	Newlands Coal Pty Ltd	Abbot Point
North Goonyella	Peabody Energy Aust Coal Pty Ltd (60%) Mitterb Pty Ltd (40%)	North Goonyella Coal Properties Pty Ltd	Hay Point
Norwich Park	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Hay Point
Oaky Creek	Xstrata Coal Qld Pty Ltd (55%) Sumisho Coal Aust Pty Ltd (25%) Itochu Coal Resources Aust Pty Ltd (10%) ICRA OC Pty Ltd (10%)	Oaky Creek Coal Pty Ltd	Gladstone
Peak Downs	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Hay Point
Riverside	BHP Billiton Ltd (80%) Mitsui & Co Ltd (20%)	BHP Billiton Mitsubishi Alliance	Hay Point
Saraji	BHP Billiton Ltd (50%) Mitsubishi Development Pty Ltd (50%)	BHP Billiton Mitsubishi Alliance	Hay Point
South Walker Creek	BHP Billiton Ltd (80%) Mitsui & Co Ltd (20%)	BHP Billiton Mitsubishi Alliance	Hay Point
Wilkie Creek	Peabody Energy Aust Pty Ltd	Peabody (Wilkie Creek) Pty Ltd	Brisbane
Yarrabee	Yarrabee Coal Company Pty Ltd	Yarrabee Coal Company Pty Ltd	Gladstone

Source: Derived from the Queensland Coal Industry Overview 2002-03, 52nd Edition

Mine Expansion Plans

According to a survey by the Queensland Resources Council (QRC) in 2004[35], the outlook is for very strong growth in coal exports from Central Queensland with the 'best estimate' projection indicating a growth in exports from 134Mt in 2004 to 206-218Mt in 2009 (an increase of 54-68 per cent).

The strongest demand will come from Central Queensland which will see up to 60 per cent growth in demand over the next five years, with the majority of this in the Northern Bowen Basin. This equates up to an additional 80Mtpa of coal exports which will require rail and port transport infrastructure, with the mines and support services requiring additional water, power and community infrastructure. According to

35 Queensland Resources Council http://www.qrc.org.au/_files/pdf/publications/submissions/Infrastructure per cent20requirements_final.pdf

QRC, the economic benefits of such expansion would result in additional annual export revenue of $4-5 billion, additional state royalties of $300-350 million per annum, and thousands of additional direct jobs in the coal industry with a two-three time multiplier effect for the state[36].

As the coal producers in Queensland were not surveyed by ABARE as part of this project, a literature review provided the following information on the major proposed coal mine expansion plans.

There are six coal mines in the Bowen Basin owned by BMA and in September 2004 BMA announced plans to boost metallurgical coal production capacity to 59Mtpa by the second half of 2006, an increase of 7Mtpa (over 13 per cent) on the 52Mtpa of coal produced from these operations in 2003-04[37]. In addition to the expansion of BMA's six mines, two other mines operated by BMA on behalf of their owners, BHP Mitsui Coal Pty Ltd will also expand at an expected cost of $254 million (expenditure includes capacity expansion at Hay Point Coal Terminal).

A major component of the expansion is the commencement in mid-2005 of punch longwall underground coal mining at the new Broadmeadow Mine in the northern Bowen Basin, which is designed to produce 3.6Mtpa.

Rail Track

The coal rail network in Queensland is owned and operated by Queensland Rail (QR), a Queensland Government-owned corporation. QR is curretly the sole provider of rail services in the State, controlling around 10,000km of track (or below-rail services) and providing almost all above-rail freight (including coal) and passenger services.

The focus of this section is the rail systems of the central and north Bowen Basin: Goonyella system servicing the Dalrymple Bay and Hay Point coal terminals where capacity constraints have been experienced since mid-2004 and major mine expansion plans are scheduled and the Newlands system servicing the Abbot Point coal terminal which is approaching capacity and where new mines are being developed.

The current capacity of this system is reported to be between 90Mt and 120Mtpa.[38] Some believe that the Goonyella system could easily handle 120Mtpa. The Goonyella system carries approximately 55 per cent of the coal hauled by QR. The Newlands and Goonyella systems are described in Diagram 18.

The Goonyella system is an electrified bi-directional track from Copabella to the Port of Hay Point with dual-unloading balloon loops, with the reminder being single track. The system is operated by remote control signalling with movements controlled out of Mackay. The track is able to handle 26 tonne axle loads at a maximum speed of 80km/hr, with maximum allowable speed varying along sections of the track based on track structure[39].

The Newlands system is a diesel operated single track except for passing loops allowing 20 tonne axle loads at a maximum speed of 60 km/hr to Collinsville and 80 km/hr on the newer Collinsville to Newlands. The system is primarily operated by remote controlled signalling with movements controlled out of Mackay, while the line between Collinsville and Newlands is operated under direct traffic control.

36 http://www.qrc.org.au/_files/pdf/publications/submissions/Infrastructure per cent20requirements_final.pdf

37 BHP Billiton Mitsui http://bmacoal.com/bccom/export/newsandinformation/MediaReleases/coalexpansionprogram.html

38 Queensland Resources Council http://www.qrc.org.au/_files/pdf/publications/submissions/Infrastructure per cent20requirements_final.pdf

39 QR Network Access http://www.networkaccess.qr.com.au/Images/Goonyella_System_Pack_tcm10-2858.pdf

Diagram 18: Major Queensland Coal Rail Systems

	Goonyella System
Track Name	• The Goonyella System is a bi -directional duplicated track with crossovers between Dalrymple Junction (7.975km) and Broadlea (157.050km) with the remainder being a single line • It is the main trunk rout e from Hay Point to North Goonyella
Gauge	• 1067mm gauge railway (3ft 6 in – narrow gauge)
Balloon Loops	• Balloon loops are located at MacArthur, Burton Coal, Moranbah North, Goonyella, Riverside, North Goonyella, Blair Athol Mine, Pe ak Downs, Saraji, Norwich Park, German Creek and Oaky Creek • Dual unloading balloons are located at Hay Point and Dalrymple Bay
Power source	• The Goonyella System is electrified by an autotransformer system
Track Length	• The Goonyella is a bi -directional duplicated track with crossovers between Dalrymple Junction (7.975km) and Broadlea (157.050km) with the remainder being a single line. • The junction for the Peak Downs, Saraji, Norwich Park, German Creek and Oaky Creek line is at Coppabella (144.520km), whilst the junction for the Blair Athol line is at Wotonga (174.202km)
Speed Allowed	• Hay Point to Hatfield has a maximum speed of 60km/h, beyond to Coppabella the maximum speed for block trains is 80km/h and freight trains is 100km/h • Dalrymple Bay section of track caters for block trains with a maximum speed of 60km/h • Bridges allow the passage of 104 t (26 tal) wagons at 80km/h
Weight Ratio (kg/m)	• Generally 60kg/m ra il with concrete sleepers • Maximum axle load for block trains is 26 tal
Operated by (remote signalling etc)	• The Goonyella System is el ectrified by an autotransformer system with the overhead lin e equipment operating at 25,000 volts, 50 hertz alternating supply
Interfaces	• Operators on the Goon yella System will encounter 238 Rail/Road interfaces - Public (with flashing light/boom gate protection) 10 - Public (with passive protection – signs) 24 - Occupation (Pr ivate access) 204
	Newlands System
Track Name	• The Newlands System is located at the northern end of the • Bowen Basin in North Queensland. It also incorporates part • of the North Coast line between Durroburra and Kai li as well • as the line to the port at Abbot Point
Gauge	• 1067mm gauge railway (3ft 6in – narrow gauge) • Single track throughout except for passing loops and consists • of four major sections

Track Name	• The Newlands System is located at the northern end of the Bowen Basin in North Queensland. It also incorporates part of the North Coast line between Durroburra and Kaili as well as the line to the port at Abbot Point
Gauge	• 1067mm gauge railway (3 ft 6 in – narrow gauge) • Single track throughout except for passing loops and consists of four major sections
Balloon Loops	• Balloon loops at Newlands, McNaughton and Abbot Point • Abbot Point to Kaili (13km) – balloon loop for unloading coal from bottom discharge wagons at Abbot Point • Collinsville to Newlands (73km) – includes the spur line to the McNaughton Mine balloon loop, the junction of which is approx 1 km beyond Collinsville, and extends to the balloon loop at Newlands Mine
Power source	• The Newlands System is not electrified
Track Length	• Abbot Point to Collinsville track comprises 98km of concrete sleepered track • Collinsville to Newlands is a newer track comprising 77km also on concrete sleepers • The Collinsville to McNaughton branch is a 9km spur line with a balloon loop on timber plated sleepers
Speed Allowed	• Abbot Point to Collinsville track will presently allow 20 tal traffic at a maximum speed of 60km/h • Collinsville to Newlands will presently allow 20 tal traffic at a maximum speed of 60km/h • The Collinsville to McNaughton branch is approved for 20 tal wagons at 60km/h • Speeds through the curved leg of turnouts are governed by the angle of that turnout: - 1 in 12 – 25km/h - 1 in 16 – 50 km/h - 1 in 25 – 80km/h
Weight Ratio (kg/m)	• Abbot Point to Colli nsville track - 98km on concrete sleepered track with 53kg/m rail • Collinsville to Newlands - 77km on concrete sleepers with 53kg/m rail • Collinsville to McNaughton branch – 9km on timber plated sleepers with 47kg/m
Operated by (remote signalling etc)	• Operated by RCS and power operated points • Universal Train Control (UTC) is available to train controllers in the Mackay Train Control Centre • Between Collinsville and Newlands, the railway is operated under Direct Traffic Control (DTC) with trailable facing poin ts
Interfaces	• Operators on the Newlands Railway System will encounter 82 Rail/Road Interfaces - Public (with flashing light protection) 9 - Public (with passive protection – signs) 12 - Occupation (Private access) 61

Rail Expansion Plans

QR is targeting a haulage task of more than 194Mtpa within five years in Queensland[40]. Most of its rail systems are forecast to achieve annual average growth of between 4.2 per cent and 5.9 per cent, but zero net growth for the Newlands system.

In 2003-04, QR won the bid to build and operate the Bauhinia Regional Rail project, a 110km $240 million spur, for the Rolleston joint venture (Xstrata Coal) and expect to haul up to 3.2Mtpa of coal from the mine at Rolleston in the first year of operation starting late 2005. QR will purchase 350 new coal wagons for this. This will be the longest rail line to be built in Queensland for nearly 20 years.

A number of projects began during 2003-04 to improve QR's coal rollingstock through the upgrade of 18 x 3900 tonne locomotives for heavy haulage coal use ($88 million) and the ordering of 500 new coal wagons ($98.6 million) of which 350 are for the Rolleston contract. Construction is due for completion by December 2005[41].

There is a need for significant additional work on the rail line from the Southern Bowen Basin to the Port of Gladstone, in particular upgrading the track from Moura and building track south of Moura to support the development of the Surat-Dawson Basin, often referred to as the "Southern missing link". The investment in this "missing link" needs to be on the medium to longer term development agenda for Queensland, but is unlikely to receive support without tonnage commitments from coal producers in the northern-Surat and southern-Bowen Basins.

Network improvements to increase capacity on the Newlands system have been identified by QR but are yet to be funded, including: increasing speed from Collinsville - Abbot Point; section upgrades and duplication; grade/curve easing; loop extensions for longer trains; and the possible North Goonyella Link (the "northern missing link")[42].

Rail Freight Operator

Access to QR's network is available through Network Access (certain business functions of QR's above rail groups wwere transferred to the Network Access Group) - the area of QR that manages the network in accordance with the requirements of the Queensland Competition Authority[43]. Network Access manages access to QR's rail network, the infrastructure assets that make up the network and operations on the network.

QLD Government Coal Infrastructure Coordination Group

The coal industry and infrastructure owners and operators have not yet established a coordinated logistics team. However, the Queensland Government, has set up a Coal Infrastructure Coordination Group in a bid to address infrastructure requirements triggered by the increase in world demand of coal. The Group, chaired by the Department of State Development and Innovation, has 11 members from across government, including from the Departments of: Premier and Cabinet, Treasury, Housing, Transport, Employment and Training, Energy, and Natural Resources and Mines. The Group is tasked to look at all issues faced by the Queensland coal industry including employment, safety, transport, energy, and infrastructure.

40 Queensland Coal Industry Overview 2002-03, 52nd Edition , 2004 publication of the Queensland Department of Natural Resources and Mines

41 QR 2003/04 Annual Report http://www.corporate.qr.com.au/Images/annual-report-2003-2004_tcm15-5555.pdf

42 QR Network Access http://www.networkaccess.qr.com.au/Images/Newlands_Info_Issue3_22-12-04_tcm10-2861.pdf

43 Queensland Rail http://www.corporate.qr.com.au/

Ports and Coal Terminals

Port of Hay Point

The Port of Hay Point, south of Mackay, is managed by the PCQ. There are two coal terminals in the Port - Hay Point Coal Terminal (HPCT) and Dalrymple Bay Coal Terminal (DBCT) that form part of the Goonyella coal chain transport chain that exports coal from the Bowen Basin coalfields in Queensland.

In 2003-04, total throughput for the port was 77.5Mtpa, comprising 43.6Mtpa through DBCT and 33.9Mtpa through HPCT. These results position the Port of Hay Point as one of the biggest export coal terminals in the world[44]. The continued growth in coal production, particularly in the Bowen Basin, ensured the total port throughput was a record in 2003-04, up 3.85 per cent over the previous best in 2002-03[45]. A total of 965 bulk carriers visited the port in 2003-04.

Dalrymple Bay Coal Terminal Infrastructure (DBCT)

Ownership/Operation

DBCT commenced operations in 1983 as a common user terminal handling coal for the Goonyella system mines in central Queensland. DBCT operates around the clock, and servicing eight users operating 11 Bowen Basin mines: Blair Athol, Burton, Coppabella, Foxleigh, German Creek, Hail Creek, Moorvale, Moranbah North, North Goonyella, Oaky Creek and Riverside mines. As a common user facility, DBCT coordinates the railing of coal from the mines, manages and operates train unloading, stockpiles and loads ships, prepares shipping documentation on behalf of the mines, and performs maintenance and minor engineering functions. The terminal handles a mixture of thermal, metallurgical and pulverised coal injection coals. It is a unique terminal that it is designed for blending operations. Blending of coals at the terminal allows the mines to market a much larger number of "brands" of coal. There are 58 coal blends registered at the terminal, with 40 blends exported in fiscal 2003-04 with each mine exporting three blends on average.

In 2001, the Queensland Government leased the terminal to a consortium led by Babcock and Brown. The coal terminal subsequently became the foundation asset of the Prime Infrastructure group, with long-term leasing and development rights for the terminal (with an option to extend its term up to 31 March 2014) when it was floated on Australian Stock Exchange in 2002.

DBCT Pty Ltd (owned by a consortium of terminal users) continues to operate the terminal on a day to day basis under the terms of an operating and maintenance contract with Prime Infrastructure. DBCT Pty Ltd has throughput contracts with terminal users on a long term, take or pay basis which insulates them from short-term fluctuations in the coal demand/supply cycle.

Terminal Capacity

DBCT has a rated throughput capacity of approximately 54Mtpa, making it the third largest terminal in the world. During fiscal year 2003-04 the terminal throughput was only 43.5Mtpa owing to production problems at three underground mines and the collapse of a stacker/reclaimer.

Hay Point Coal Terminal (HPCT)

Ownership/Operation

HPCT is a privately operated dedicated facility handling coal exclusively for the BMA mines by BMA whom manages and operates HPCT for and on behalf of the Central Queensland Coal Associates Joint

44 PCQ http://www.pcq.com.au/2004/ports_haypoint.cfm

45 PCQ 2003/04 Annual Report http://www.pcq.com.au/2004/downloads/2004pcq_annualreport.pdf

Venturers, owners of the HPCT. There are six coal mines in the Bowen Basin owned by BMA: Goonyella - Riverside, Peak Downs, Saraji, Gregory,

Norwich Park and South Walker. The majority of coal product from these mines is exported through the HPCT with some coal exported through DBCT.

Terminal Capacity

HPCT has a rated throughput capacity of approximately 34Mtpa and set an individual throughput record, up by 6.82 per cent on the previous best ever result in 2002-03. The terminal is currently exporting at its maximum annual throughput capacity, and with scheduled and unscheduled maintenance shut downs the excess tonnage produced by BMA mines is exported through DBCT. Specifications of DBCT and HPCT coal terminals are in Diagram 19.

Diagram 19: Port of Hay Point

	Dalrymple Bay Coal Terminal	Hay Point Coal Terminal (BMA)
Overview	▪ Constructed in 1983 as a common user coal export facility ▪ Owned by the Queensland Government ▪ Leased by Prime Infrastructure (DBCT) Management Pty Ltd since September 2001 for 50y (+ optio n 49y) ▪ Operated by Dalrymple Bay Coal Terminal Pty Limited ▪ Nameplate throughput capacity – 56Mtpa ▪ Handles coal from 10 northern Bowen Basin mines ▪ Expansion plans – third rail loop and associated inloading system with a third conveyor to stockyard, new stac kers/reclaimers and two new stockyard bunds, improvements to other yard equipment and control systems, third surge bin, third outloading conveyor and optional fourth berth and shiploader	▪ Constructed 1969 -71 ▪ Located 38 km south of Mackay ▪ Owned by BHP Billit on Mitsubishi Alliance (BMA) 50%each to service their mines ▪ Operated by Hay Point Services Pty Ltd ▪ Nameplate throughput capacity - 34Mtpa ▪ Services 9 BMA owned and operated mines ▪ Expansion program to increase annual throughput capacity from 34 Mtpa to 40 Mtpa by second half of 2006
Coal Receival	▪ Electrified rail system ▪ Average 15 trains per day ▪ Average distance from mine - 232km (160 - 300km) ▪ 2 x 5,550tph rail capacity	▪ Electrified rail system ▪ Average 11 trains per day, 100,000 tonnes per day ▪ Average distance from mine – 230km ▪ 4,000tph rail capacity
Coal Stockpiles	▪ 5x stockpile rows ▪ 3 x 1.2 km x 60 m ▪ 2 x 1.2 x 112 m ▪ 2.4Mt working capacity	▪ 6 x stockpile rows; nominal capacity 2Mt ▪ Stockpiled and reclaimed separately due to the different quality specifications of each coal type. ▪ Coals may be blended at the port to meet customers' specific quality requirements. ▪ 1 x 7,000tph stacker
Coal Loading	▪ 1.6 m wide, 5.0m/sec conveyor belts ▪ Conveyor systems supported on jetties, which run out to sea and allow loading i n deep water. ▪ 4x 3,800 and 2 x 4,200tph reclaiming capacity ▪ 3 x 7,200tph shiploading capacity	▪ Conveyor systems supported on jetties, which run out to sea and allow loading in deep water. ▪ 1 x 4800 and 1 x 3500tph reclaiming capacity ▪ 1 x 6,000tph and 1 x 4,5 00tph shiploading capacity ▪ 2 shiploaders
Berths	▪ 3.8 km wharf ▪ Berth space for three vessels ▪ Berth No. 1 depth 17.9 m lowest astronomical tide (LAT) ▪ Berth No. 2 depth 18.3 m LAT ▪ Berth No. 3 depth 18.9 m LAT ▪ 13.1 m approach to channel ▪ Tidal range < 7.14m	▪ 1.8 km wharf ▪ Two berth space , allowing simultaneous loading ▪ Depth at berth 16.4 m, less 10 per cent of sailing draft ▪ Departure draft 17.7 m (max) ▪ Approach channel depth 13.1 m (min)
Vessel Capacity	▪ 2 x Capesize vessels up to 200,000 dwt ▪ 20,000 dwt min capa city ▪ 300 m max length ▪ 56 m max beam	▪ Capesize vessel 230,000 dwt max capacity ▪ 15,000 dwt min capacity ▪ 315 m max length ▪ 50 max beam

Port of Abbot Point

Situated about 25km north of Bowen, the Port of Abbot Point is Australia's most northerly coal port. The Port has significant potential given there are very few locations along Queensland's eastern seaboard where deep water (>15m) is so close in-shore. Coal is supplied to Abbot Point by rail from the Xstrata owned Newlands and Collinsville mines. The port terminal is operated by Abbot Point Bulk Coal Pty Ltd, which is part of the Newlands-Collinsville-Abbot Point Project a wholly owned subsidiary of Xstrata Coal Pty Ltd[46]. Abbot Point is a dedicated coal port handling product from Newlands and Collinsville coal mines. The port comprises a rail in-loading facility, coal handling and stockpile areas, and a single trestle jetty and conveyor connected to a berth and ship loader, located 2.75km off-shore. Specifications of Abbot Point are included in Diagram 20.

Diagram 20: Port of Abbot Point

	Abbot Point Bulk Coal Terminal
Overview	▪ Constructed in 1984 ▪ Owned by Xstrata Coal ▪ Operated by Abbot Point Bulk Coal Pty Ltd, part of the Newlands-Collinsville-Abbot Point Project ▪ Net Operational Capacity – 15Mtpa ▪ Annual through capacity – 12Mtpa ▪ Annual throughput capacity services two mines
Coal Receival	▪ Single track ▪ 300m rail loop accommodating 2 trains up to 67 wagons long with a total capacity of approximately 4,200 tonnes ▪ Average distance from mine -141 km (106-176 km) ▪ 4,000tph rail receival capacity
Coal Stockpiles	▪ Stockpile capacity of 260,000t (live) and 750,000t (dead) ▪ 2 x 4,000tph stacking capacity
Coal Loading	▪ 4,600tph conveyor belts ▪ 4,600tph shiploading capacity
Berths	▪ 264m wharf ▪ Berth 466m ▪ 17.2 m depth at berth ▪ Tidal range <2.5m
Vessel Capacity	▪ 166,000 dwt max capacity ▪ 20,000 dwt min capacity ▪ 297 m max length ▪ 47.5 m max beam

Source: Derived from the Ports Corporation of Queensland http://www.pcq.org.au

Port of Gladstone

The Port of Gladstone is owned and operated by Central Queensland Ports Authority (renamed from the Gladstone Port Authority prior on 1 July 2004), a Government Owned Corporation under the *Government Owned Corporation Act 1993*). Coal is exported through the Port of Gladstone through the RG Tanna Coal Terminal (RGTCT) and Barney Point Coal Terminal (BPCT) from mines in the southern Bowen Basin. An increase in coal exports of 11 per cent saw total coal exports increase by 4.2Mtpa to a total of 42.4Mtpa in 2003-04[47]. Specifications for coal terminals at Gladstone are at Diagram 21.

46 Xstrata Coal http://www.xstrata.com/reports/doc/xta-ir2004_en.pdf

47 GPA 2003/04 Annual Report http://www.gpa.org.au/Pages/Publications/Annual per cent20Report/Annual per cent20Report per cent202004.pdf

Diagram 21: Port of Gladstone

	Barney Point Coal Terminal	R G Tanna Coal Terminal
Overview	▪ Operations commenced in 1967 ▪ Owned and operated by the Central Queensland Ports Authority ▪ Common user facility ▪ Nameplate throughput capacity - 5Mtpa ▪ Expansion plans – Increase throughput capacity from 5M tpa to 7Mtpa. Expected to be completed by June 2005.	▪ Operations commenced in 1980 ▪ Owned and operated by the Central Queensland Ports Authority ▪ Common user facility ▪ Nameplate throughput capacity - 40Mtpa ▪ $80 million expansion project was officially completed in June 2003 and increased the terminal's throughput capacity from 30 Mtpa to 40Mtpa ▪ Handles coal from over 10 mines in Central Queensland ▪ Expansion plans – increase capacity from 40Mtpa to 54M tpa by upgrading shiploading streams to 6,000tph, building stockpiles 17 and 18, installing a third shiploader and conveyor stream, and installing a thrid rail unloading station. Expected to be completed by third quarter 2006.
Coal Receival	▪ Bottom dump wagons discharge coal into underground feeders ▪ Receival conveyor belt ▪ 1 x 2,000tph rail capacity ▪ Average distance from mine - 267 km (140-394 km)	▪ Two stockpiles unloaded 6,000tph simultaneously ▪ Average distance from mine - 291.5 km (189-394 km)
Coal Stockpiles	▪ 2 rows each side of stacker (525 m long) of 70,000 tonnes each = 140,000 tonnes ▪ 400,000 tonnes total storage capacity ▪ Coal stacker as stockpiling method ▪ Front-end loaders as stockpiling equipment	▪ 11 x 300,000t capacity ▪ 1 x 120,000t capacity ▪ 2 x 100,000t capacity ▪ 1 x 80,000t capacity ▪ 4 x 60,000t capacity ▪ 4 x 50,000t capacity ▪ 4.2 million tonnes total storage capacity ▪ Stockpile rate 6,000tph
Coal Loading	▪ Coal reclaimed using front -end loaders to discharge into reclaim hoppers ▪ Single vessel loaded at 2,000tph	▪ Reclaim rate – dozers required to produce a nominal capacity of 2,000tph ▪ Max shiploading rate - 2 x 4,000tph (8,000tph total) ▪ Average gross loading rate 2,60 tph each
Berths	▪ Berth space for one vessel ▪ 15.0 m low water ordinary spring tides (LWOST) depth at berth (under keel clearance at berth 0.5 m) ▪ 15.5 m departure draft (greater depending on tide) ▪ 13.5 m approach channel depth (11.5 m in turning basin, north -west of wharf) ▪ Length of wharf 2 05 m	▪ Berth space for three vessels ▪ 18.8 m LWOST depth at berth (under keel clearance at berth 0.5 m) ▪ 17 m departure draft on any day (18 m departure draft on days of highest tides) ▪ 16 m approach channel depth (10.4 m in turning basis, north -west end of wharf) ▪ Length of wharf 1,095 m
Vessel Capacity	▪ 12,000 dwt minimum capacity ▪ 90,000 dwt (fully loaded) maximum capacity ▪ 150,000 dwt (part loaded cape size vessels) maximum capacity ▪ 160 m max length ▪ 45 m max beam	▪ 25,000 dwt minimum capacity (or subject to approval) ▪ 220,000 + dwt maximum capacity (larger vessels subject to approval) ▪ 315 m max length ▪ 55 m max beam

Source: Derived from the Central Queensland Ports Authority http://www.gpa.org.au

Port of Brisbane

The Port of Brisbane is managed and operated by the Port of Brisbane Corporation, also a Government Owned Corporation. The port is the third largest container port in Australia and coal is exported through only one of the port's 30 berths. Thermal coal from the Jeebropilly, Oakleigh, Acland, and Wilkie Creek collieries in the Ipswich, West Moreton and Surat Basin regions is transported by rail to the Queensland Bulk Handling facility at the port. In 2003-2004[48] over 3.1Mtpa of coal was exported from the Port of Brisbane compared to 3.5Mtpa exported in 2002-03 (a decrease of almost 13 per cent). Coal is the Port of Brisbane's second largest exported commodity by volume exceeded only by oil.

[48] Port of Brisbane Corporation 2003/04 Annual Report http://www.portbris.com.au/asp/trade/commodities.asp#Anchor-COAL

Queensland Bulk Handling handles the export of coal through the Brisbane (Fisherman Islands) coal terminal at the Port of Brisbane. The rated throughput capacity is currently 5Mtpa and in 2003-04 3.1Mtpa was exported through the port. Specifications of Brisbane Coal Terminal are in Diagram 22.

Diagram 22: Port of Brisbane

	Brisbane Coal Terminal (Fisherman Island)
Overview	▪ Government owned ▪ Operated by Queensland Bulk Handling Pty Limited ▪ Common user facility ▪ Nameplate capacity throughput - 5 Mtpa ▪ Located on Fisherman Islands ▪ Handles coal from around seven mines
Coal Receival	▪ Receival by rail at 2,500tph ▪ Receives five coal trains per day, carrying around 1,800 t of coal ▪ Average distance from mine – 169 km (56 - 282 km)
Coal Stockpiles	▪ Stockpile capacity 300,000 tonnes
Coal Loading	▪ One shiploader ▪ Maximum shiploading rate of 3,000 tonnes per hour
Berths	▪ Berth space for one vessel ▪ 13.5 m depth at berth (low water, including underkeel clearance) ▪ 13.5 m (tidal) departure draft ▪ 14 m approach channel depth
Vessel Capacity	▪ 10,000 dwt min capacity ▪ 138,000 dwt max capacity (loaded to approx 107,000 tonnes) ▪ 269 m max length ▪ 43 m max beam

Source: Derived from the Port of Brisbane Corporation http://www.portbris.com.au/

Port and Terminal Expansion Plans

Port capacity expansions at DBCT and RGTCT were completed in 2003. These expansions incorporated the construction of a third berth at each terminal and increased capacity to 54.5Mtpa at DBCT and to 40Mtpa at RGTCT.

Abbot Point

A combination of increased demand from the existing users, new mines and possible new trades have all contributed to completely changing the outlook for Abbot Point in the short to medium term. In response, a master planning exercise is underway to understand how the facility and port could be expanded to meet demand. The PCQ estimates that the Abbot Point Coal Terminal will export over 13Mt coal in 2004-05[49].

By increasing terminal efficiency and operation it is suggested that Abbott Point can increase export capacity up to 18Mtpa with existing infrastructure.

Provision for future expansion of Abbot Point terminal was made in its original design and it is understood that the terminal should be able to be expanded to at least 30-40Mtpa. In late 2004, PCQ undertook to update its Master Plan for the terminal and identify possible expansion paths, costings and timeframes. As well as the necessary enhancements of the existing infrastructure, expansion of the terminal would require the construction of the 'northern missing link' rail line connecting the Goonyella corridor to the Abbot Point corridor. This project has been examined several times in the past and to date has not been justified due to a lack of corresponding mine expansions which makes the project uneconomical.

The projected expansion of capacity in the Northern Bowen Basin may necessitate a review of the potential of this 'missing link' and an assessment of the value in expanding the Goonyella rail network to

[49] Port of Brisbane Corporation 2003/04 Annual Report http://www.portbris.com.au/asp/trade/commodities.asp#Anchor-COAL

Hay Point compared with the security and flexibility of investing in the missing link and expanding Abbot Point.

Port of Hay Point

Significant expansion plans are currently occurring or scheduled to commence in the coming year at both coal terminals at the Port of Hay Point. While the Port (and therefore existing coal handling and ship loading facilities/infrastructure) is adjacent to the Great Barrier Reef Marine Park and World Heritage Areas, it is excluded from the Great Barrier Reef Marine Park.

Hay Point Coal Terminal

Proposed expansion of current operations at the HPCT would increase the capacity of the terminal from the existing 34Mtpa to 39.5Mtpa (it has been suggested that through operational optimisation, 41Mtpa could be achieved). The expansion works will be contained to land-based operations and will be located between the current stockyards and the neighbouring DBCT therefore not directly impacting on the Great Barrier Reef Marine Park or World Heritage Areas.[50]

Through increased throughput capacity, efficiency improvements and additional stockyard capacity, the terminal will have greater flexibility for optimum operation. The expansion involves extending two existing coal stockpiles as well as constructing an additional bund and a Stacker/Reclaimer, upgrading selected inloading conveyors and yard conveyor widths, speeds, structures, chutes and skirts to enable and increase from 4,500tph to 6,000tph and improve stacker reclaimer efficiency to 6,000tph stacking and a 8,000tph peak reclaiming capacity.

The owners, BMA, anticipate that expansion work will commence immediately after all appropriate statutory approvals have been received and be operational within 20 months of commencing construction.

Dalrymple Bay Coal Terminal

Since commencement, DBCT's operating capacity has grown continuously and Prime Infrastructure has committed to increasing the capacity of the terminal to meet the ongoing requirements of its customers. The last expansion (stage 6) was handed over to DBCT Pty Ltd on 30 June 2003 and included construction of a third berth, a new ship loader, mooring dolphins and conveyor galleries increasing the terminal capacity to around 54Mtpa.

DBCT has throughput contracts with terminal users on a long term, take or pay basis. This insulates DBCT from short-term fluctuations in the coal demand/supply cycle.

Prime Infrastructure has expressed concern about the accelerating global demand and current mine expansion plans in central Queensland which potentially require terminal expansion at short notice.

In 2004, DBCT developed a Master Plan to identify a potential need to increase terminal capacity based on indications provided by users. Contracted capacity demanded by users for 2005 is 56Mtpa. To date users have not contracted capacity above 60Mtpa but it is considered that users could potentially demand capacity up to 70Mtpa by 2006 and 90Mtpa by 2008. Expansion to 90Mtpa will make DBCT the largest coal export terminal in the world. DBCT is currently undergoing a $30 million upgrade to increase capacity from 55Mtpa to 59Mtpa to be completed at the end of 2005.

Given the uncertainty in user's capacity requirements, the Master Plan identified a path to 60Mtpa and three possible expansion paths for capacity beyond 60Mtpa. Expansion beyond 60Mtpa is likely to be the subject of both a new Development Agreement and an Environmental Impact Statement. A number of

[50] BMA www.bhpbilliton.com

users are seeking to expand their throughput and have been unable to finalize contractual arrangements with DBCT Management. The consequences to them, and to the Queensland economy, are substantial. Further, the Group is aware that DBCT Management has entered into new contracts with two new users from 1 July 2005, which will further increase demand on the terminal capacity.[51]

The Queensland Competition Authority (QCA) has received 18 submissions in response to their draft decision on DBCT's Draft Access Undertaking. Prime Infrastructure is awaiting a final decision by QCA (due in April 2005) before deciding on the structure of its investment on expansion as outlined in the Master Plan.

Prime Infrastructure also announced late last year that it had commenced detailed design and engineering work to expand the capacity of DBCT to 91Mtpa. They had already completed pre-feasibility and pre-engineering studies as part of the 2003 Master Plan. The date of completion of these expansions is uncertain as DBCT is awaiting an investment decision.

Gladstone

The Gladstone Port Authority (GPA) has anticipated the need for increased capacity of its two coal export terminal, port development plans are proceeding in line with mine developments. During the first half of 2004, GPA commenced detailed planning for the provision of the infrastructure necessary to cater for forecast future growth. Planning progressed to implementation with shareholding Ministers' in-principle approval for a $167.5 million expansion of the RG Tanna Coal Terminal (RGTCT) received in June 2004, to increase the capacity from 40-54Mtpa. The project proposes to meet capacity increases through the construction of a third shiploader and associated conveyor stream; a third unloading station; speeding up of the existing shiploading conveyor systems; and additional stockpile capacity. This project will increase capacity at RGTCT by 8Mt in 2005-06 and a further 6Mt in 2006-07. GPA is currently completing RGTCT's Stockpile 16 which was initiated in December 2003.[52]

It should be noted that the current expansion plans for the RG Tanna Coal Terminal will see the Port of Gladstone become congested for current port uses. The Central Queensland Port Authority (CQPA) has commissioned a Port Capacity Study through Mansells. The study will be completed in the next few months.

As part of the overall expansion program at the Port of Gladstone, the BPCT will undergo expansion, increasing its capacity from 5 to 7Mtpa. A train unloading station and wharf remediation projects are scheduled for completion in 2004-05. The resulting increase in throughput capacity will be achieved by separating inloading and shiploading functions and by improving scheduling and stockpile management at the terminal.

It is expected that both terminals will export a total of 44.5Mtpa in 2004-05 and there is potential to reach around 62-65Mtpa by 2008-09.

Brisbane

There is currently spare export coal capacity at the Port of Brisbane and no expansion plans are scheduled.

51 Prime Infrastructure www.primeinfrastructure.com.au

52 GPA 2003/04 Annual Report http://www.gpa.org.au/Pages/Publications/Annual per cent20Report/Annual per cent20Report per cent202004.pdf

International Communications Action Plan

Objectives

- Reassure Australian coal export destination countries' governments and key customers that Australia remains a secure, reliable and competitive supplier to the world coal market.
- Ensure open lines of communication between all interested parties to raise awareness of the current infrastructure situation in Australia.
- Communicate strategies to address infrastructure constraints and infrastructure improvements.
- Receive feedback and respond to queries from major markets' governments and key customers.

Stakeholders

Relevant overseas Ministers and government agencies, industry associations and key customers (major steel, power generating and shipping companies) and Australian coal marketers in traditional and emerging markets such as Japan, Europe, Korea, Chinese Taipei, India, Mexico and China. **Attachment A** provides a detailed list of stakeholders. In addition, the Trade Liaison Committee, and key shipping agents and coal agents in Australia should also be informed of infrastructure issues and developments.

Key Messages

Although messages will change overtime, key themes to be conveyed include:

- Australia is a major and reliable producer of high quality coal and minerals.
- Worldwide coal producers and infrastructure providers were caught unaware by the strong increase in demand for resources in 2004.
- Whilst production capacity and infrastructure are being expanded, the market will remain tight over the next two years.
- Whilst the Australian Government has limited responsibility for most infrastructure investment decisions, it is committed to working with the States and private sector to accelerate infrastructure development.
- The Australian Government has also called upon industry to ensure better coordination of infrastructure investment decisions in the future.
- The Australian Government will regularly update key customers, government agencies and industry associations on progress in implementing measures, development of capacity along our supply chains and government policy updates related to the coal industry and infrastructure.
- The Australian Government will maintain dialogue with stakeholders throughout the process.

Communication Channels

- Ministerial briefings to overseas government counterparts.
- Posts liaising with key countries' government and industry.
- Electronic mechanisms such as electronic bulletins, emails and DITR webpage.
- Bilateral government officials meetings and international forums.
- International networks.
- Minerals Council of Australia, Australian Coal Association, NSW Minerals Council and Queensland Resources Council providing information on infrastructure to visiting industry groups.

Attachment B details the framework for communicating the key messages.

It is recommended that DITR and DFAT appoint communications officers to manage this strategy.

ATTACHMENT A

Stakeholder Details for Communications Action Plan

(Please see seperate attachment)

ATTACHMENT B

Framework for Communicating Key Messages

(Please see seperate attachment)

Australian Government Senior Officials Group - Terms of Reference

Senior Officials Group

An Australian Government Senior Officials Group on Coal Transport Infrastructure was formed by Ministers to conduct independent analysis of coal transport infrastructure issues and report on short and long term measures that have been and can be taken to address infrastructure issues related to the coal industry including establishing better coal supply chains. The Group was established in response to bottlenecks at the port of Newcastle and ports in Queensland in the first half of 2004 and concerns over the potential impact on current and future coal exports, Australia's international competitiveness, investment attractiveness and the perception of customers about Australia's reputation as a reliable coal supplier. Comprising of representatives from the Departments of Industry, Tourism and Resources (DITR), Foreign Affairs and Trade (DFAT), and Transport and Regional Services (DOTARS).

Aim

To examine the appropriateness of current strategies to address infrastructure requirements of the coal industry and propose, where necessary, any additional short and long term measures for consideration by Government and industry.

Terms of Reference

To provide accurate, objective and appropriate policy advice to relevant Ministers, the report should:

1. Examine current and planned coal transport infrastructure capacity in New South Wales and Queensland.

2. Examine the key issues impacting on the effectiveness of coal transport infrastructure services and facilities to meet the needs of the industry in both the short and long term.

3. Examine measures for improving the cost effectiveness of the coal supply chain in both New South Wales and Queensland.

4. Identify the proposed and if required additional measures to address the short and long term infra structure needs of the coal industry.

5. Consider Commonwealth responsibilities and key areas of national interest.

6. Consider a communications strategy that will ensure Australian coal export customers are aware of the actions being taken in Australia to address short and long term infrastructure requirements and maintain Australia's international reputation as a reliable supplier of high quality coal.

In undertaking the above, the report should have regard to independent analysis of infrastructure issues and consult with transport operators and managers, coal producers and other relevant industry groups, logistical personnel, and other Australian and State government officials.

Abbreviations

ABARE	Australia Bureau of Agricultural and Resource Economics
ACA	Australian Coal Association
ACCC	Australian Competition and Consumer Commission
ARTC	Australian Rail Track Corporation
Auslink	Australian Government's land transport plan released in June 2004
BHP Billiton	BHP Billiton (Australia) Pty Limited
BMA	BHP Billiton Mitsubishi Alliance
BPCT	Barney Point Coal Terminal
CAMBA	China-Australia Migratory Bird Agreement
CBS	Capacity Balancing System
CDS	Capability Distribution Systems
CHSA	Coal Handling Services Agreement
CoAG	Council of Australian Governments
DBCT	Dalrymple Bay Coal Terminal
DFAT	Australian Department of Foreign Affairs and Trade
DIPNR	NSW Department of Infrastructure, Planning and Natural Resources
DITR	Australian Department of Industry, Tourism and Resources
DOTARS	Australian Department of Transport and Regional Services
dwt	dry weight tonnes
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FOB	Free on board
GPA	Gladstone Port Authority
HPCT	Hay Point Coal Terminal
HPS	Hay Point Services Pty Limited
HVCCLT	Hunter Valley Coal Chain Logistics Team
IPART	Independent Pricing and Regulatory Tribunal (NSW)
JAMBA	Japan-Australia Migratory Bird Agreement
Km/h	Kilometres per hour
LAT	lowest astronomical tide
LWOST	low water ordinary spring tides
MCA	Minerals Council of Australia
Mt	Million tonnes
Mtpa	Million tonnes per annum
NCC	National Competition Council
NCIG	Newcastle Coal Infrastructure Group
NCP	National Competition Policy
NPC	Newcastle Port Corporation
NSW	New South Wales
Part IIIA	*Trade Practices Act 1974*
PC	Productivity Commission
PCI	Pulverised Coal Injection
PCA	Ports Corporation of Queensland
PCQ	Ports Corporation of Queensland
PI	Prime Infrastructure
PWCS	Port Waratah Coal Services
QCA	Queensland Competition Authority
QCA Act	*Queensland Competition Authority Act 1997*

Qld	Queensland
QR	Queensland Rail
QRC	Queensland Resources Council
RAMSAR	Convention on Wetlands (Ramsar, Iran 1971)
RBA	Reserve Bank of Australia
RCS	Remote Controlled Signalling
RGTCT	RG Tanna Coal Terminal
RIC	New South Wales Rail Infrastructure Corporation
RLMC	NSW Regional Land Management Corporation Pty Limited
ROM	Run of Mine
Senior Officials Group	Australian Government Senior Officials Group on Coal Transport Infrastructure
Tal	Total axle load
TIC	Transport Infrastructure Charge
TPA	*Trade Practices Act 1974*
Tph	tonnes per hour
TSC Act	*Threatened Species Conservation Act 1995*
UTC	Universal Traffic Control
WACC	Weighted Average Cost of Capital
SDPWO Act	State Development and Public Works Organisation Act 1971
GBRMPA Act	Great Barrier Reef Marine Park Authority Act 1975
GSP	Gross State Product
SEPP	State Environment Planning Policies

Glossary

ACCC
The Australian Competition and Consumer Commission (ACCC) is an independent Commonwealth statutory authority formed in 1995 to administer the *Trade Practices Act 1974* and the *Prices Surveillance Act 1983*. The ACCC is the only national agency dealing generally with competition matters and the only agency with responsibility for enforcing the *Trade Practices Act* and the state/territory application legislation. Its primary responsibility is to ensure that individuals and businesses comply with the Australian competition, fair trading and consumer protection laws, with the key objective of preventing anti-competitive conduct.

Access Seekers
Parties looking to gain access to a service that they do not own.

Access Undertaking
Provides a framework for the processes and responsibilities of access seekers and owners/ operators.

Auslink Land Transport White Paper
The White Paper is the Australian Government's formal policy statement on land transport. It is a National Plan that outlines the Government's future approach to tackling the transport challenges facing Australia. The Australian Government has committed to $11.8 billion to Australia's land transport system over the next five years and the Government and the Australian Rail Track Corporation will invest $1.8 billion in rail including projects that will directly provide capacity expansions in the Hunter Valley coal fields.

Australian Coal Association
The Australian Coal Association (ACA) is an industry body representing Australian black coal producers.

Bituminous Coal
Bituminous coals are dense black solids, frequently containing bands with a brilliant lustre. The carbon content of these coals ranges from 78 to 91 per cent and the water content from 1.5 to 7 per cent.

Bottlenecks
Section of a system which limits the system performance.

Capacity Allocation System / Capacity Distribution System/Capacity Balancing Systems
System that allocates a share of the coal loaders capacity to each coal mine to ensure total export sales do not exceed the ports capacity and hence reduce ship queues.

cape size vessel
Bulk carrier of about 100,000-200,000 tonnes deadweight.

Coking coal
Coking coal is heated in ovens to create coke which is an essential ingredient in the steel making process.

Council of Australian Governments (CoAG)
The peak inter-governmental forum in Australia. CoAG comprises the Prime Minister, State Premiers, Territory Chief Ministers and the President of the Australian Local Government Association (ALGA). The Prime Minister chairs CoAG.

Demurrage
Demurrage payments (late loading penalties paid) caused by the queue cost Hunter Valley coal producers more than A$100 million in 2003. If nothing had been done to reduce the queue, demurrage for 2004 was heading for over A$300 million. Demurrage is a function of the length of time a vessel waits in a queue. Demurrage fees are negotiated on a ship to ship basis between the purchaser and seller during contract negotiations. When vessels are required to wait longer than a specified time to load coal, the vessel owners charge demurrage on a daily basis. If one producer is late, they pay the demurrage for the entire ship (total tonnage), not just the hold they were to fill.

Gas Access Code
The *Gas Pipelines Access (Commonwealth) Act 1998* was passed by Parliament on 9 July 1998. This Act gives effect to the Commonwealth's role in implementing the national third party access regime for natural gas pipelines in fulfilment of the Council of Australian Governments' (CoAG) commitment to 'free and fair' trade in natural gas. It accords with the Commonwealth's obligations under the *Natural Gas Pipelines Access Agreement*, signed by Heads of Government at the CoAG meeting of 7 November 1997, to enact legislation to facilitate the national character of the scheme. The Act also makes operational the legislation enacted by each State and Territory to implement the National Gas Access Code.

Hard and Soft (Semi-soft) Coking Coal
Hard coking and soft coking coal are relative terms used to describe variations in the strength of the coke used for steel manufacture.

Hilmer Report
National Competition Policy Report 1993

Hunter Valley Coal Chain Logistics Team
The Hunter Valley Coal Chain Logistics Team was established as a formal independent planning entity to provide planning and logistics services to all its members consistent with the System Rules. Membership of the Hunter Valley Coal Chain Logistics Team is open to all infrastructure owners and operators servicing the coal industry in the Hunter Valley

IPART
The Independent Pricing and Regulatory Tribunal (IPART) oversees regulation in the water, gas, electricity and public transport industries in New South Wales. The *Transport Administration Amendment (Rail Corporatisation and Restructuring) Act 1996* requires market participants to refer access disputes to the Tribunal for resolution in accordance with Part 4A of the IPART Act and the NSW Rail Access Regime established by the Minister for Transport.

Kyoto Protocol
The Kyoto Protocol originated at the 3rd COP to the United Nations Convention on Climate Change held in Kyoto, Japan in December 1997. It specifies the level of emission reductions, the deadlines and methodologies that signatory countries (i.e. countries who have signed the Kyoto Protocol) are to achieve.

Metallurgical coal
Metallurgical coal is another term used for coking coal. The coal typically has a low volatile matter content, high rank and low impurities.

National Energy Regulator
Body established to encompass the energy regulation roles of the Australian Competition and Consumer Commission, the state regulators, the National Electricity Code Administrator and the National Competition Council.

National Competition Council (NCC)
The NCC was established by all Australian governments in November 1995 to act as a policy advisory body to oversee their implementation of National Competition Policy (NCP) under Part IIIA of the TPA. Although the Council is funded by the Commonwealth Government, it is accountable to all Australian States and Territories through the Council of Australian Governments (CoAG).

The National Competition Council plays a number of roles under part IIIA, including making recommendations to relevant Ministers on:

- applications to declare particular services for access;
- applications to certify State or Territory access regimes as effective; and
- applications for coverage (and revocation of coverage) of particular gas pipelines under the National Gas Code.

Open cut mine
Surface mining, economic only when the coal seam is relatively close to the surface, recovers a higher proportion of the coal deposit than underground methods.

Panama Vessel
Vessel of about 60,000-80,000 tonnes deadweight.

Preparation Plant
Plant where the raw run-of-mine coal is processed into a range of clean, graded, and uniform coal products suitable for the commercial market.

Queensland Competition Authority
In Queensland, the Queensland Competition Authority (QCA) was established by the *Queensland Competition Authority Act 1997* (QCA Act). The QCA is an independent Statutory Authority and while the Authority is subject to the written directions of the Ministers in performing its

functions, it is not subject to government direction in relation to the conduct of investigations, reports or access to services.

ROM coal
Coal as mined, known as run-of-mine coal, contains a mixture of different size fractions, sometimes together with unwanted impurities such as rock and dirt.

Royalty
The payment to a State for the right to extract and use the State's mineral resources.

Sub-Bituminous Coal
Sub-bituminous coals usually appear dull black and waxy. They have a carbon content between 71 and 77 per cent and a moisture content of up to 10 per cent and are used for electricity generation or can be converted to liquid and gaseous fuels.

Thermal coal
Thermal coal is used as a fuel to produce steam for the generation of electricity and in manufacturing processes requiring heating. The coal typically has high specific energy and high volatile matter content. Steaming coal is another term for thermal coal.

Underground mine
There are two main methods of extracting coal by underground mining: *room-and-pillar* (or, *bord-and-pillar*) and *longwall mining*. Room-and-pillar mining involves cutting a network of 'rooms' or panels into the coal seam and leaving behind 'pillars' of coal to support the roof of the mine. Longwall mining involves the use of mechanised shearers to cut and remove the coal at the face. Self-advancing, hydraulic-powered supports temporarily hold up the roof whilst the coal is extracted.

Stakeholders Consultation

Australian Government
Department of Industry, Tourism and Resources
Department of Transport and Regional Services
Department of Foreign Affairs and Trade
Department of Treasury
Department of Prime Minister and Cabinet
Australian Competition and Consumer Commission

Government-owned Corporation
Australian Rail Track Corporation

NSW Government
NSW Premier's Department
Department of Infrastructure, Planning and Natural Resources
Department of Primary Industry - Mining
Department of State and Regional Development
NSW Treasury
Crown Solicitor's Office

Government-owned Corporations
Newcastle Port Corporation
Rail Infrastructure Corporation
Regional Land Management Corporation

Queensland Government
Department of the Premier and Cabinet
Queensland Treasury
Department of State Development and Innovation
Department of Transport
Department of Energy
Department of Housing
Department of Employment and Training
Department of Natural Resources and Mines

Government-owned Corporations
Queensland Rail
QR Network Access
Gladstone Port Authority
Ports Corporation of Queensland

Private infrastructure owners and operators
Dalrymple Bay Coal Terminals Pty Ltd
Prime Infrastructure
Port Waratah Coal Services Limited
Pacific National
Hunter Bulk Terminals, a division of Pacific National
Hay Point Services
Hunter Valley Coal Chain Logistics Team

Mine owners and operators
Anglo Coal Pty Ltd
Apollo Resources/Idemitsu Kosan Pty Ltd
BHPBilliton Australia Pty Ltd
Bloomfield Collieries Pty Ltd
Camberwell Coal Pty Ltd
Centennial Coal Pty Ltd
Donaldson Pty Ltd
Excel Coal Pty Ltd
Glennies Creek Coal Pty Ltd
Gloucester Coal Pty Ltd
Newpac Pty Ltd
Rio Tinto Coal Australia Pty Ltd
Whitehaven Coal Mining Ltd
White Mining/Itochu Pty Ltd
Xstrata coal Pty Ltd

Industry Associations and Alliances
Minerals Council of Australia
Queensland Resources Council
New South Wales Minerals Council
Newcastle Coal Infrastructure Group

Consultants
Newcastle Coal Terminals Pty Ltd
Michael Deegan

Customers
Nippon Steel
Japan Coal Development Australia
Mitsubishi Developments