



Review of Coal Supply Chains

Final Report

March 2009
Synergies Economic Consulting Pty Ltd
www.synergies.com.au

Disclaimer

Synergies Economic Consulting (Synergies) has prepared this advice exclusively for the use of the party or parties specified in the report (the client) and for the purposes specified in the report. The report is supplied in good faith and reflects the knowledge, expertise and experience of the consultants involved. Synergies accepts no responsibility whatsoever for any loss suffered by any person taking action or refraining from taking action as a result of reliance on the report, other than the client.

In conducting the analysis in the report Synergies has used information available at the date of publication, noting that the intention of this work is to provide material relevant to the development of policy rather than definitive guidance as to the appropriate level of pricing to be specified for particular circumstance.

Executive Summary

Background

Synergies Economic Consulting (Synergies) has been engaged by the National Transport Commission (NTC) to undertake a review of the role of Government in coal supply chains in Australia. The NTC has embarked on a process of significant national transport reform. As part of this it identified ten priority areas, one of which was Capacity Constraints and Supply Chain Performance.

Coal is one of four nationally significant supply chains identified for review under this priority area. The purpose of the review is to identify and analyse key issues that might be contributing to capacity constraints and/or impeding supply chain performance, and make recommendations as to the role of Government in response to these issues. This relates to both its existing roles and its possible future role/s. All coal supply chains are included in the scope of the review.

The problems that emerge as a result of coordination failures in coal supply chains are already reasonably well known, particularly in the capacity constrained systems such as Hunter Valley and Goonyella. Initiatives have commenced in some systems (including these two) to attempt to address the underlying causes of coordination failure. These initiatives have been considered as part of this review, noting that they are all at a relatively early stage of development and hence it is difficult to assess the likelihood of success at this stage.

Process

An important aspect of our review was consultation with coal supply chain participants and stakeholders. This involved one-on-one interviews, workshops in Brisbane, Newcastle and Port Kembla and written submissions. A key purpose of the workshops was to develop and test the recommendations.

Analysis of the problem

A well-functioning supply chain would possess the following features:

1. operational coordination between all elements of the supply chain;

2. contractual alignment and accountability for performance, so that operational assumptions underpinning contractual obligations are consistent throughout the supply chain and reflect actual performance;
3. whole of supply chain planning (whether by a single entity or being coordinated by an individual service provider adopting agreed and common operational planning assumptions); and
4. a contractual framework that allows for the expansion of the capacity of the supply chain to be underpinned by contracts with current and future producers.

No coal supply chain currently exhibits all of these features. As each supply chain is different, the problems have manifest in different ways. Similarly, while we believe that these four features should be present in all supply chains, the way in which they are implemented should also depend on the nature and characteristics of each system.

There are two underlying causes of failure, being:

- a lack of alignment between participants in relation to optimising supply chain performance; and
- information gaps, which impede planning and operations.

These problems emerge because coal supply chains are made up of a number of participants with different owners and disparate business objectives. Each element of the supply chain will naturally seek to optimise its own performance rather than being primarily concerned to improve the performance of the supply chain as a whole.

For supply chain performance to be improved and optimised it is necessary for the natural tensions created by these different business objectives to be resolved to the point where the four features outlined above are successfully implemented in a manner that is appropriate to that supply chain's characteristics. This can only be sustainably achieved where each party's legitimate business interests are not compromised. The fact that these tensions have not been resolved to date manifests in the two main causes of failure noted above.

In resolving these tensions the clear feedback to emerge from the consultation is that this should be driven by industry. The role of Government is therefore considered limited. We concur with this view. However, industry could fail to adequately address coordination problems could occur for a number of reasons, including:

- there is inadequate commitment to developing a solution (or a lack of a consensus on the nature and extent of the problem and the need for it to be resolved). This risk is considered particularly high in those systems that may not yet have experienced capacity constraints but have the potential to do so in future;
- industry embarks on the development of a solution but is unable to agree to it in a reasonable timeframe; or
- industry agrees a solution but it is not compatible with the requirements of Government.

Industry therefore needs to be accountable for developing an appropriate solution within a reasonable timeframe. If it fails to do this, then there is a case for more active Government intervention.

Conclusion

Our overall conclusion from the review is therefore that coal supply chains should self-regulate. Coordination initiatives should be driven by industry and founded in commercial agreements. Self-regulation is possible because no single participant has the ability to gain at the expense of all other participants. However, self-regulation will depend on the industry achieving sufficient incentives and enforceable sanctions in its self-regulatory regime.

In our view, the key reason that coal supply chain participants have not successfully addressed the causes of coordination failure to date is because not all participants have perceived there to be adequate incentive to co-operate. There could be individual winners and losers from a more cooperative approach. Those who perceive a risk that they will be worse off will be less willing to cooperate. In a capacity constrained environment there can be incentives to game rather than cooperate as access to capacity has considerable strategic value.

This incentive could be provided by the threat of Government intervention if industry fails to address the causes of coordination failure in a timely manner, as a Government-imposed solution could present a far worse outcome for participants. However, the threat of intervention needs to be credible and real. In our view, the key role for Government is to monitor the supply chains and provide a credible threat to intervene, and be prepared to intervene, if self-regulation fails.

It is important to recognise that the reform of supply chain co-ordination is likely to be evolutionary. This is no different to the reforms that have been experienced in other infrastructure industries in Australia where arrangements have been continuously improved and refined in response to market challenges and greater sophistication in

the underlying metrics have emerged. In this regard, it is better that modest gains are secured in the short term through supply chain improvement processes bringing greater alignment and accountability to supply chain participants noting that greater gains can occur over time as the arrangements evolve and further improvements are effected.

Recommendations

The key focus of this review is what the role of Government in the coal supply chains should be going forward, and the circumstances under which this involvement could be triggered. Roles such as safety and environmental regulation and taxation are largely non-discretionary. Otherwise, the main roles for Government are seen as being in four key areas, being:

- policy-making;
- economic regulation;
- ownership; and
- planning.

Finally, it is also important to ensure that there is adequate coordination of these roles within Government, including managing its interfaces with supply chain participants in a consistent manner.

The overarching principle that should underpin the framework is ensuring that responsibility for decision-making is assigned to the party that is best able to make those decisions, which is the party that has the best information. However, they must be accountable for these decisions. Accountability is fundamental to the performance of the coal supply chains going forward.

Our recommendations are contained in the following Box.

Recommendations

Policy

1. The features of an effectively functioning coal supply chain (Features) should include:

- effective operational coordination between all elements of the supply chain;
- contractual alignment and accountability for performance, so that operational assumptions underpinning contractual obligations are consistent throughout the supply chain and reflect actual performance;
- whole of supply chain planning (whether by a single entity or being coordinated by an individual service provider adopting agreed and common operational planning assumptions); and
- a contractual framework that allows for the expansion of the capacity of the supply chain to be underpinned by

- contracts with current and future producers.
2. The way in which the Features manifest in an effective supply chain co-ordination solution will vary with each supply chain (depending upon the nature and operation of that chain).
 3. If State Governments have public interest objectives in relation to the coal supply chain coordination that require solutions to exhibit additional features, (Additional Features) those features need to be articulated and communicated to industry upfront.
 4. Industry participants in each supply chain (including producers and service providers) should have primary responsibility for developing, implementing and managing a solution for that supply chain which adequately exhibits the Features and Additional Features based on its nature and operations (an Effective Solution).
 5. Industry participants should appoint representatives of the supply chain (Representatives) to interface with State Government on the development and implementation of an Effective Solution.
 6. State Government should monitor the progress of coal supply chain reform processes to ensure that Effective Solutions are developed and implemented within a reasonable timeframe. It is anticipated that development and implementation should be completed within 2 years.
 7. The State Government's role should involve the following steps:
 - as soon as practicable informing the participants of each supply chain of:
 - the Features and whether there are Additional Features that State Government requires be incorporated into supply chain co-ordination arrangements;
 - the proposed timeframes for the processes outlined below (noting that these timeframes are considered indicative and that alternative timeframes might be agreed between Government and the Representatives);
 - Representatives of each supply chain should report to Government on the extent to which existing initiatives are underway to implement an Effective Solution for that supply chain within 2 months of being informed by Government of the Features and Additional Features required for each supply chain;
 - where a supply chain is able to demonstrate initiatives are underway to develop an Effective Solution, then within 24 months Representatives of that supply chain should be able to demonstrate implementation of Effective Solution;
 - where the Representatives of a supply chain are not able to demonstrate initiatives are underway to develop an Effective Solution, then:
 - within a further 6 months, the Representatives of that supply chain should develop and submit to Government principles and an implementation plan (Effective Solution Plan) for the development of an Effective Solution; and
 - within a further 18 months (Implementation Period) representatives of that supply chain should be able to demonstrate to Government implementation of the Effective Solution.
 8. Representatives of each supply chain should report to Government on the status of implementation at 6 monthly intervals (or as otherwise agreed with Government) during the Implementation Period.
 9. If at the end of the Implementation Period there are aspects of a Solution that have been agreed by participants but are not yet implemented, then a Plan should be developed to detail the steps and measures that will be taken to ensure that an Effective Solution emerges and is implemented.
 10. If Government does not accept any aspect of an Effective Solution Plan or the implementation of an Effective Solution, it should engage with the Representatives and following discussions with the Representatives, if necessary:
 - specify the deficiencies and inform the Representatives of those deficiencies (having regard to the nature and operation of the supply chain); and
 - specify the process by which these deficiencies are to be resolved to Government's satisfaction.
 11. If industry fails to meet any of these requirements, Government should intervene.

12. The nature of the intervention should be determined by the relevant State Government having regard to the extent of progress that has been achieved and the nature of the impediment or impediments that have emerged.

13. This intervention could include one or all of the following:

- information – notifying supply chain participants if any aspect of a supply chain co-ordination solution does not adequately exhibit the Features or Additional Features and the nature of changes that would be necessary for this requirement to be satisfied;
- facilitation – for example, as a catalyst (where there is a failure to initiate the process) or where the outstanding issues are well understood by supply chain participants;
- expert mediation – where issues arise requiring the input of a person who possesses expertise and experience in the efficient operation of bulk supply chains;
- arbitration or regulatory intervention - where it is clear that the industry will not be otherwise be able to reach an Effective Solution, the relevant State Government should intervene to:
 - establish an alternative solution, which would be imposed on the industry in the event that it does not develop an Effective Solution within a defined period; or
 - impose a solution.

14. When intervening in a supply chain, the relevant State Government should consult with any economic regulator with active responsibilities in relation to the infrastructure that comprises the supply chain.

15. Government should also intervene to overcome specific barriers to the development of an Effective Solution. For example, that might include requiring supply chain participants to provide information to bodies appointed to coordinate activity in the supply chain on a commercial-in-confidence basis.

Economic Regulation

16. COAG should modify the Competition and Infrastructure Reform Agreement to ensure that economic regulators have regard to the efficiency of the supply chain as a whole. This could occur by modification to the objects clause to:

...promote the economically efficient use of, operation and investment in, significant infrastructure, within the context of the supply chain as a whole, thereby promoting effective competition in upstream or downstream markets...”

17. Where more than one service provider in the same supply chain is regulated:

- it should be by the same regulator;
- the relevant regulator should ensure that regulatory arrangements are compatible with the Effective Solution; and
- the timing of regulatory processes should be structured so as to facilitate consistent regulation of the supply chain participants.

18. Existing mechanisms be retained to allow affected parties to initiate the application of third party access regulation to service providers who fail to actively participate in the development of an Effective Solution.

Ownership

19. Where Government is delivering services it should ensure that it is leading and cooperating to maximise supply chain efficiency. Government shareholders should ensure Government Business Enterprises have clear commercial objectives to ensure they act in a way that delivers whole of supply chain efficiency whilst not compromising their legitimate business interests:

- in the case of Government-owned businesses in Queensland, this could be included in their Statement of Corporate Intent. This could be done as part of their next annual review;
- in ARTC's case, it could be written into the objectives contained in the Tripartite agreement between the

Commonwealth, New South Wales Government and ARTC. This would require amendment to that agreement;

- this should also be included in RailCorp's corporate objectives. It is noted that it also has a Statement of Corporate Intent, which is reviewed annually.

20. Any future major supply chain expansions involving more than one Government-owned corporation should be developed jointly between those businesses.

Planning

21. Information collected by Governments that assists in planning should be freely disseminated. In this respect:

- Government needs to undertake the planning required to facilitate coal supply chain Master Planning and communicate this to industry participants in a timely way. This means Transport Departments in the relevant jurisdictions provide the following information to the relevant supply chain participants:
 - information regarding the number of paths that will be available to coal traffics for at least the next 10 years for all supply chains;
 - information regarding the likelihood of any material change to coal's utilisation of the network beyond this timeframe. If this remains very uncertain, the Government could provide information on the nature and timing of its expected decision-making process;
- State Governments to facilitate master planning processes by:
 - responding to requests as to the desirability of sites for new coal terminals; and
 - facilitating action to ensure that incompatible land uses do not locate in the environs of future port sites;
- at the request of industry participants, State Governments facilitate cross supply chain master planning processes.

Implementation

22. State Governments establish clear responsibility for each of its roles in supply chains. This may, but need not, involve the appointment of a central contact for each role within Government (which may or may not be the same agency). This role would coordinate the various agencies within Government that have responsibilities for all or part of the supply chain with the purpose of:

- monitoring the performance of the coal supply chains;
- ensuring that Government undertakes any specific initiatives, or removes impediments, to improving supply chain performance, as outlined above;
- ensuring that necessary information is provided to facilitate planning; and
- participating in planning at a strategic level.

Contents

Executive Summary	4
1 Introduction	12
1.1 Purpose and scope	12
1.2 Structure of this report	13
2 Characteristics of each supply chain	14
2.1 New South Wales	14
2.2 Queensland	17
2.3 Implications of system characteristics for improving co-ordination	21
3 Issues Emerging from this Review	22
3.1 Achieving optimal supply chain performance	22
3.2 Symptoms of coordination failure	23
3.3 Causes of coordination failure	24
4 Status of each Supply Chain	36
5 The Role of Government in Coal Supply Chains	40
5.1 Existing Roles	40
5.2 Future roles	43
5.3 Implementation	56
6 Recommendations	58
A National Transport Policy Framework	64
B Participants in Consultation	65
C Causes of supply chain failure	67

1 Introduction

1.1 Purpose and scope

Synergies Economic Consulting (Synergies) has been engaged by the National Transport Commission (NTC) to undertake a review of the role of Government in coal supply chains in Australia. The NTC has embarked on a process of significant national transport reform. As part of this process the NTC submitted its National Transport Policy Framework to the Australian Transport Council (ATC) in February 2008. The transport policy objectives and principles are summarised in Attachment A.

The National Transport Policy Framework identified ten priority areas for reform. One of these priorities was Capacity Constraints and Supply Chain Performance. Responsibility for this priority was allocated to the South Australian Government. The work plan developed by this working group identified twelve supply chains of national significance. Coal is one of four pilot studies nominated for review.

The main purpose of this review is to examine the role of Government in addressing capacity constraints and improving coal supply chain performance into the future. The primary objectives of the review are summarised in the following Box.

Box 1 Objectives of this review

1. Provide a sound understanding of the dynamics of the supply chain and its geography.
2. Identify immediate issues.
3. As far as practicable, identify major trend and changes likely to arise in the future as a consequence of external factors which should be overlaid with current issues.
4. Identify constraints in the supply chain as a result of government policy or intervention which discourage collaboration within industries and to identify ways in which industries can operate in a more collaborative manner to increase efficiency.
5. Determine the appropriate response and role for government and industry to optimise the efficiency of the supply chain. This may take the form of recommendations that will feed into Infrastructure Australia and/or regulatory changes.

An important aspect of our review was consultation with coal supply chain participants and stakeholders. This involved one-on-one interviews, workshops in Brisbane, Newcastle and Port Kembla and written submissions. A key purpose of the workshops was to develop and test the recommendations. A list of the organisations that participated in the consultation is provided in Attachment B.

1.2 Structure of this report

This report presents the main outcomes and recommendations emerging from our review of coal supply chains in Australia. It is structured as follows:

- Chapter 2 provides an overview of each supply chain;
- Chapter 3 describes the key issues emerging from this review;
- Chapter 4 summarises the status of each supply chain in addressing capacity constraints and supply chain performance;
- Chapter 5 discusses the role of Government in improving supply chain performance; and
- Chapter 6 contains the recommendations.

2 Characteristics of each supply chain

Each of the coal supply chains is different and needs to be considered as such. However, the underlying drivers of coordination failure will be similar, although these problems may manifest themselves in different ways. By way of background, this section provides an overview of the characteristics of each supply chain. An assessment of the status of each supply chain in addressing coordination problems is presented in Chapter 4.

2.1 New South Wales

2.1.1 Hunter Valley

An overview of the Hunter Valley coal supply chain is provided in the following Box.

Box 2 Overview of the Hunter Valley coal supply chain

There are currently some 39 mines operating in the Hunter Valley^a. While many of these developments are owned by the larger players there are also a number of small producers. The Hunter Valley is the largest of the coal supply chains in Australia, with throughput of 84.8 mt in 2007.^b Total receipts at the port as at December 2008 was 91.9mt.^c

Coal is railed on the Hunter Valley network to two coal terminals at the Port of Newcastle (also referred to as Port Waratah) – Carrington and Kooragang. The port is owned by the Newcastle Ports Corporation and the coal terminals are operated by Port Waratah Coal Services (PWCS). PWCS is owned by several Hunter Valley coal producers, who hold a 70% share in the company, and a number of other participants, predominantly coal importers, who make up the remaining 30%. A third terminal is currently being developed by the Newcastle Coal Infrastructure Group (NCIG). The first stage of the terminal is expected to be operational in 2010 with a target capacity of 30mtpa.

The Hunter Valley coal supply chain currently operates under a cargo assembly operating mode with limited stockpile capacity at the existing terminals. The third terminal will have more stockpile capacity.

The below-rail network is managed by ARTC under a long-term lease with the NSW Government. ARTC is currently regulated by the Independent Pricing and Regulatory Tribunal (IPART) although this will soon be assumed by the Australian Competition and Consumer Commission (ACCC).

There are two above-rail operators providing haulage services on the network. Pacific National currently has the dominant market share. QR National Coal commenced operations in 2005 and currently hauls around 13 mtpa.^d

^a Australian Government (2005), Delivering Reliable Australian Coal Exports to the World: Coal Transport Infrastructure, Report prepared for the Department of Industry, Tourism and Resources; NSW DPI (2008), New South Wales Coal Industry Profile 2008, NSW Government.

^b Port Waratah Coal Services Limited, Annual Report 2007.

c Port Waratah Coal Services Limited, December 2008 End of Month Report, www.pwcs.com.au.

d NSW DPI (2008), New South Wales Coal Industry Profile 2008, NSW Government.

Historically, because of the common user provisions there have been no long-term contracts in place at the port. In the absence of these long-term contracts it is impossible to achieve contractual alignment between the rail and port.

The Hunter Valley was the coal first supply chain in Australia to exhibit significant capacity constraints, with capacity rationing having been in place at the port for some years.¹ It is also the first supply chain to have central coordination, with the Hunter Valley Coal Chain Logistics Team (HVCCLT) established in 2004. The primary focus of the HVCCLT to date has been on improving operational performance in the short-term. It is also about to release its first supply chain Master Plan. Feedback from the consultation indicated very positive support for its role and what it has achieved so far. However, there are some concerns regarding its independence.

The capacity rationing arrangements were seen as a short-term measure to manage the queue of ships at the port until a long-term solution to the supply-demand imbalance could be developed. In 2008 the New South Wales Government appointed the Honourable Nick Greiner AC to facilitate the development of this solution. This solution was submitted to the Government in July 2008. Some of the key recommendations made were:

- the establishment of an independent body to perform the roles currently fulfilled by the HVCCLT. This would also enable the execution of confidentiality agreements with producers to facilitate the sharing of information;
- recognition that the Coordinator will need to have more authority, and needs representation by coal producers;
- an industry-agreed proposal in relation to port terminal access, supported by long-term take-or-pay contracts; and
- long-term contracts between producers and the below-rail provider.

The solution was rejected by Government on the basis that it was not seen as having made sufficient provision for access to capacity by new entrants. Since then, industry and Government have continued to negotiate a revised arrangement.

¹ A short-term capacity distribution system was first authorised by the ACCC in July 2004. The medium-term capacity balancing system was authorised in April 2005 and extended in April 2008.

In December 2008, the Government announced that industry agreement to its revised proposal in relation to the allocation of port capacity had been secured. The key elements of the Government's proposal include:

- Triggers requiring terminals to build new capacity on demand;
- Long term contracts to underpin investment in terminal capacity;
- Industry levy to help fund new terminal infrastructure where required;
- Guaranteed access for new entrants and expanding producers;
- Business and planning certainty for existing producers;
- Protection for small producers; and
- Proposal for a 4th coal terminal.²

One of the most contentious issues in reaching this agreement with industry was the ability to compress producers' existing tonnages shipped through the port to accommodate new entrants. Compression can significantly undermine any confidence that long-term contracts can provide to producers in being able to fully utilise their investment at the minesite and fulfil their contractual obligations with their end customers. It is understood that that limited compression remains a feature of the revised arrangement (subject to a cap), although this is only intended to be utilised as a last resort. The key features of the Government's proposal relate to how further expansions will be triggered. Compression will only be relied upon if these mechanisms have failed.

While the details of the solution are yet to be developed and implemented, the high level principles that have been agreed have the potential to address the key issues constraining supply chain performance in the Hunter Valley, although the focus of the solution agreed with the New South Wales Government is the allocation of port capacity. Some of these principles may have the potential for application in other supply chains although the absence of long-term contracts for port capacity has been unique to New South Wales.

2.1.2 Port Kembla

The Port Kembla coal supply chain is relatively unique, with almost 40% of exported coal is transported via road (and the balance by rail). The other issue faced here that is

² The Honourable Joe Tripodi, M.P. (2008), Plan to end Coal Supply Chain Deadlock, Media Release, 12 December.

not as significant an issue in the other supply chains – with the exception of the West Moreton system in Queensland – is that coal faces competition from other traffics for rail capacity, including passenger services. The supply chain is relatively small, with throughput of around 12.6mt in the 2007-08 financial year.³ However, inquiries indicated that demand could increase significantly above this in the future (up to 25 mt per annum⁴).

While capacity constraints have not been evident to date, feedback received from a workshop with members of the Port Kembla supply chain suggests that this system is potentially on the ‘cusp’ of experiencing capacity bottlenecks if demand growth continues. It is therefore attempting to plan to accommodate this future growth. A Master Planning (strategy) group has been established for this purpose. It is also undertaking a Commercial Framework review to ensure that the commercial arrangements in the supply chain facilitate the optimisation of supply chain performance going forward.

The key issue that is impacting the ability to plan for growth is uncertainty in relation to future rail capacity. This is an issue that goes beyond the scope of the coal supply chain as it relates to how many rail paths will be available to coal in the future. Related to this problem is a lack of “control and visibility across the Pit to Port supply chain”⁵. Without an understanding of the capacity of the entire supply chain it is extremely difficult to know where the capacity constraints are likely to emerge and how they should be addressed. The uncertainties in relation to rail capacity will need to be resolved as part of the development of this holistic view.

2.2 Queensland

All of the below-rail network infrastructure in the central Queensland coal systems is owned and operated by QR Network, a government-owned corporation and wholly-owned subsidiary of Queensland Rail. The terms and conditions of access provided by QR Network, including pricing, are regulated by the Queensland Competition Authority (QCA). These terms and conditions are contained in its Access Undertaking, which is currently reviewed by the QCA once every four years.

QR National Coal (QRNC), also a wholly-owned subsidiary of QR, is the only above rail operator currently operating in the central Queensland coal systems, however

³ Source: Interview with Port Kembla Coal Terminal; submission from Port Kembla Port Corporation.

⁴ Submission from Port Kembla Port Corporation, 20 October 2008.

⁵ Submission from Port Kembla Coal Terminal, 21 November 2008, p.6.

Pacific National is anticipated to enter the market for rail haulage in the foreseeable future. QRNC currently operates under an internal access arrangement with QR Network, which is based on the Standard Access Agreement that is annexed to the Access Undertaking. A key objective of the regulatory framework is to ensure that the terms and conditions of access to QRNC are similar to those that would apply to a third party operator.

2.2.1 Blackwater/Moura

The Blackwater and Moura systems are closely integrated, with both systems exporting through the Port of Gladstone. There are two terminals at the Port of Gladstone – the RG Tanna Coal Terminal and the Barney Point Coal Terminal. The Port of Gladstone and both of the export terminals are owned and operated by the Gladstone Ports Corporation.⁶ Coal exports through the port totalled 54.1mt in 2007-08, which was up 2.6mt from 2006-07 but 9.2mt below target⁷.

Limited specific feedback emerged in relation the Blackwater/Moura systems. Informal coordination has already been instigated by way of a number of initiatives. These initiatives include:

- daily scheduling between above-rail, below-rail and port;
- the Capricorn Coal Chain Maximisation project, which is intended to examine ways to maximise existing supply chain capacity (this also involves above-rail, below-rail and port). As this has been considered successful they are looking at continuing this going forward, with a revised charter; and
- a whole of supply chain capacity review, which is currently being undertaken.

A key difference between Blackwater/Moura and the Goonyella system is the availability of stockpile capacity at the port, which alleviates some of the pressure in relation to optimising system performance in the face of demand growth. However, this does not mean that appropriate coordination within the supply chain is any less important as issues can still emerge, particularly as the complexity of the co-ordination task increases with the future development of the Wiggins Island coal terminal and the Southern Missing Link (linking the Surat Basin to the Port of Gladstone).

⁶ The Central Queensland Ports Authority changed its name to Gladstone Ports Corporation on 13th March 2008.

⁷ Gladstone Port Corporation, Annual Report 2007-08. GPC attributed the failure to achieve the target to rail restrictions and flooding in central Queensland.

It is possible that the informal coordination that has been instigated will address (and/or avert) the potential for failure however it is difficult to assess this at this stage.

2.2.2 Goonyella

A brief overview of the Goonyella system is provided in the Box below.

Box 3 Overview of the Goonyella coal supply chain

There are currently 14 mines in the Goonyella system, owned by 6 different producers.^a The BHP Billiton Mitsubishi Alliance (BMA) is responsible for around 44% of production, with Rio Tinto Coal the next largest with 23%.

Coal is transported to the Port of Hay Point for export. There are two export terminals located at Hay Point – Dalrymple Bay Coal Terminal (DBCT) and Hay Point Coal Terminal (HPCT).

DBCT is a common user facility which services several mines in the central Bowen Basin. In 2001, the Queensland Government entered into a long term lease with Prime Infrastructure (now Babcock and Brown Infrastructure) for the management of the terminal. Terms and conditions of access are regulated by the Queensland Competition Authority (QCA). DBCT is currently the only regulated coal port in Australia.

DBCT Pty Ltd, which is owned by a consortium of terminal users, is responsible for the day-to-day operation of the terminal under the terms of the operating and maintenance contract that it holds with the Babcock & Brown Infrastructure Group (BBI). HPCT is privately owned and operated by BMA and is dedicated to the hauling of coal from BMA mines. Hay Point Services Pty Ltd is responsible for the operation of the terminal.

^a Wood Mackenzie Energy, Coal Supply Service, <http://www.woodmacresearch.com>.

As noted above, like the Hunter Valley, there has been considerable focus on the issues here given capacity constraints have already clearly emerged in this system. While the infrastructure providers are working to address capacity constraints, there is considerable debate over the capacity of the supply chain, that is, what will be able to be delivered through DBCT. Contracts are in place and are currently not aligned. The fundamental mismatch is between rail (even railings) and port (cargo assembly).

The Dalrymple Bay Coal Chain (DBCC) Central Coordinator was established following the O'Donnell review. There was general support in the consultation for the role of the Central Coordinator and the positive operational improvements it has yielded to date. In the consultation, a key issue of contention is the exclusion of Hay Point Services from the central coordination. Some were of the view that it has to be 'brought in', given it shares supply chain infrastructure. Others are of the view that BMA had 'got things right' and does not necessarily need to be brought in (other than facilitating coordination of shared supply chain infrastructure).

The DBCC Board has recently commenced an initiative to address the causes of coordination failure in the system. The principles producers believe ought to underpin the 'long term solution' were contained in the authorisation application submitted by

Goonyella producers to the ACCC in relation to the queue management system at Dalrymple Bay. While the authorisation application was rejected, it is understood that progress on this is continuing.

2.2.3 Newlands

The Newlands coal supply chain consists of a rail network which transports coal from mine sites at Collinsville, Sonoma and Newlands to the export terminal at the Port of Abbot Point. In 2007-08 total throughput at the port was around 12.5mt. Significant expansions are planned at Abbot Point over the next few years, enabled by the construction to the Northern Missing Link which will accommodate demand growth from mines in the Goonyella system.

Commissioning up to 100 mt was expected to occur by 2015.⁸ However, with the downturn in the coal market and the global financial crisis, QR Network has suspended construction work on the Northern Missing Link. On the 18th of February 2009, the Queensland Government reaffirmed its commitment to ensure that the project proceeds.⁹

No specific feedback was received in relation to this system, other than in relation to the development of the Northern Missing Link/Abbot Point expansion. When this occurs, Newlands will effectively be integrated with the Goonyella system. In noting this, infrastructure providers face particular issues in relation to stranding risk to the extent that Abbot Point is seen as providing optional capacity for Goonyella users. Particularly in the current environment, this highlights the importance of long-term take-or-pay contracts to underwrite both the rail and port developments.

2.2.4 West Moreton

The West Moreton system is located in south-west Queensland. Coal is transported from mine sites in the Surat Basin and Clarence-Moreton Basins at Macalister, Acland and Ebenezer through the metropolitan area in Brisbane to the Port of Brisbane for export. A small volume of coal is also railed to the Swanbank Power Station for domestic use. Maximum capacity is currently estimated to be around 7.2mtpa of export coal and 0.5mtpa of domestic coal.

⁸ QR Network (2008), QR Network's Access Undertaking (2009): Volume 2, Central Queensland Coal Reference Tariffs, September.

⁹ Queensland Government (2009), "Bligh Government Committed to Northern Missing Link", http://www.dme.qld.gov.au/media_centre.cfm?item=731.0.

Unlike the other Queensland coal networks (but similar to Port Kembla) the West Moreton system is not a dedicated coal rail network. In particular, coal traffic must travel on the Brisbane metropolitan network and share the track with high frequency passenger services, as well as other freight. This not only constrains the capacity of the system based on limitations on the number of paths available to coal, but it also necessitates timetabled rail operations given the need to work in with the metropolitan timetables. A secondary capacity constraint is the Toowoomba range crossing.

Apart from the capacity implications, issues have been raised with the use of the metropolitan network by coal traffic (including noise and coal dust). Going forward, there could be pressure to further constrain the transportation of coal on the network. The construction of the Southern Missing Link, which is currently being examined by a private consortium, would enable the transport of coal from the Surat Basin to Gladstone and hence accommodate much of the future growth from this area.

No specific feedback was received on this system. We are also not aware of any existing coordination initiatives within the supply chain. Similar to Port Kembla, future operations and planning will be influenced by the ongoing availability of paths to coal traffic. This decision is beyond the control of the coal supply chain participants.

2.3 Implications of system characteristics for improving coordination

Recognition of the differences between supply chains is of fundamental importance when considering any solutions. It is clear that a 'one size fits all' approach is not appropriate here. As will be outlined below, each supply chain is different in terms of the complexity exhibited, the initiatives that might improve supply chain performance and the progress towards, and likely effectiveness of, these initiatives.

However, as the underlying causes of coordination failure are the same, the solutions would be expected to have some common features as is borne out in the issues emerging from this review. These issues are examined in the next chapter.

3 Issues Emerging from this Review

3.1 Achieving optimal supply chain performance

In order to be able to identify, understand and assess possible failures in coal supply chains it is first useful to consider what a well-functioning supply chain might look like. In our view, it would look like the following:

- investment is occurring at the right time, in the right place and in the right sequence;
- when capacity becomes constrained, supply chain performance is able to be optimised to maximise the utilisation of available capacity;
- there are clear price signals to inform consumption and investment decisions;
- all supply chain participants are accountable for their contribution to supply chain performance, which in turn means that producers are able to contract to a defined level of reliability;
- participants and prospective new entrants have certainty in relation to the path that is to be followed to obtain access to additional supply chain capacity.

This is not necessarily readily observable. What is more observable is the consequence of sub-optimal supply chain performance, such as system bottlenecks, although this is only evident when capacity is constrained. However, it is possible to observe whether or not the market contains the key features that are considered necessary to become a well-functioning supply chain. There are four key features:

1. operational coordination between all elements of the supply chain;
2. contractual alignment and accountability for performance, so that operational assumptions underpinning contractual obligations are consistent throughout the supply chain and reflect actual performance;
3. whole of supply chain planning (whether by a single entity or being coordinated by an individual service provider adopting agreed and common operational planning assumptions); and
4. a contractual framework that allows for the expansion of the capacity of the supply chain to be underpinned by contracts with current and future producers.

What is clear is that no coal supply chain currently exhibits all of these features. However, a number are currently attempting to address all or some of them, noting the inherent differences between supply chains that need to be considered. Our assessment of the status of each supply chain against these features is provided in Chapter 4. The remainder of this chapter will consider the causes of coordination failure.

3.2 Symptoms of coordination failure

One of the challenges in addressing supply chain issues is to separate symptoms from causes. Addressing the underlying causes of failure is fundamental to any long-term solution, which in turn requires these causes to be clearly understood.

There are a number of issues that have emerged, or have the potential to emerge, in coal supply chains. All of these issues were identified in the consultation. These include:

- different views on the deliverable capacity of the individual elements of the supply chain (or the inability to form a view on this capacity) rather than a uniform appreciation amongst participants of the capacity of the supply chain as a whole;
- fundamental contractual mismatches, including:
 - different underlying assumptions on key aspects such as capacity;
 - incompatible terms and conditions in contracts (including, for example, parties contracting to differing levels of capacity commitment for differing elements of the supply chain);
- short-term operational failures (impeding the maximisation of supply chain efficiency) spilling over to adversely affect other elements of the supply chain;
- no holistic view on long-term planning; and
- sub-optimal risk management, e.g. parties may be bearing risk that could be better shared with, or borne by, other parties in the chain.

Many of the behaviours exhibited in the supply chain reflect participants operating as 'silos', operating independently of one another with often competing business objectives. Optimal supply chain outcomes will only occur where the various elements

of the supply chain operate with a full appreciation of their interdependence (based on the performance of the supply chain as a whole). For example, a number of participants in the consultation mentioned that producers are using the supply chain to secure competitive advantage over one another in what is an intensely competitive market environment. Despite this, participants recognised that they should be competing in their own market but not in the supply chain.

This situation has also created a culture of blame shifting when operational failures occur. This arises due to a lack of transparency and accountability for performance for each of the supply chain participants. The central coordinators in both the Hunter Valley and Dalrymple Bay have yielded important improvements here in terms of analysing and reporting operational issues in the supply chain, although they are currently only treating the symptoms rather than the underlying causes of the problem. Initiatives have now commenced in both systems to treat the causes.

3.3 Causes of coordination failure

There are numerous causes of co-ordination failure in coal supply chains. These include:

- Information and co-ordination as the essence of supply chain co-ordination is the availability of all relevant information and the capacity to coalesce that information in a timely fashion to inform logistical decisions;
- Competitors competing for advantage in the supply chain so that their interests are not aligned with one another;
- Pervasive externalities in the sense that everyone affects everything else in a supply chain, but such impacts are rarely properly accounted for in assessments of capacity consumption;
- Incomplete contracts such that supply chains leave important relationships without any documented governance framework and others have contracts which are unable to contemplate the full range of outcomes that emerge over the life of the contract;
- Complements and substitutes – different elements of the supply chain will naturally be complementary with one another but may also be substitutable which means that increasing supply chain capacity may mean that different elements of the supply chain are winners and losers;
- Hold up concerns – where one infrastructure element's expansion is undermined by a failure of another participant to expand its capacity.

Attachment C elaborates on these sources of co-ordination failure. However, they emerge from fundamental causes being a lack of common ownership (creating a lack of alignment in incentives) and information gaps. These are considered in turn.

3.3.1 Different ownership

Coal supply chains are complex. As noted above, there is a number of different participants and a myriad of direct and indirect interfaces. Participants serve different shareholders that will have different objectives and business drivers. Each participant is naturally obligated to act in the best interests of their shareholders to achieve those objectives.

It is not realistic to have full vertical integration of the coal supply chains from mine to port. In contrast to the Pilbara, there is and has always been considerable diversity in the ownership of coal mining tenements in each major coal mining region in Australia.

While having the same business objectives would greatly facilitate the achievement of optimal supply chain performance, it is not a necessary condition. However, the existence of different business objectives through the supply chain in turn highlights the challenge presented by the existence of differing incentives – each element of the supply chain will naturally seek to optimise its own performance rather than being primarily concerned to improve the performance of the supply chain as a whole.

Accordingly, for supply chain performance to be improved and optimised it is necessary for the natural tensions created by these different business objectives to be resolved, both in the short-term and the long-term. This can only be sustainably achieved where each party's legitimate business interests are not compromised. The fact that these tensions have not been resolved to date manifests in two main causes of failure in the supply chain (which are also related), being a lack of alignment and information gaps or asymmetries.

3.3.2 Lack of alignment

Description of the problem

Supply chain performance can still be significantly improved without common ownership, although it does make the task more complex. In order to do this, an appropriate degree of alignment in the supply chain is needed. This alignment is currently absent in all coal supply chains, to varying degrees.

Achieving alignment does not mean fully aligning business objectives, but rather establishing (or clarifying) the common purpose of participants in the supply chain and

ensuring that this purpose is met. This is supported by appropriate alignment of the terms and conditions of contracts that impact the way in which the participants define capacity and use, contribute to and interact with the supply chain.

At the heart of this problem is the absence of a consistent view of capacity across the supply chain, both in terms of the way in which that capacity is defined (for example, on the basis of the capacity of the particular element of the supply chain in isolation or in the context of the supply chain as a whole) as well as how it is measured. In the Goonyella system this has extended to capacity being underpinned by different assumptions in relation to the system operating mode (see Box 4).

Box 4 System operating mode and system capacity

There are several operating models that can be adopted to govern how each of the individual elements of a supply chain interact. The most common operating models in Australia are cargo assembly and rail to stockpile.

Under a cargo assembly operating mode, the entire supply chain is responsive to the shipping stem (the requirements of the vessels about to be loaded at the coal terminal). Under this operating model, the operations of the rail system will be dominated by the need to assemble the necessary cargoes at the port terminal. The key attribute of this operating mode is that the operations of the mine, rail system and the port become more interdependent.

The other major form of operating model is the rail to stockpile approach. Under this operating model, the rail system operates to build stockpiles at the port terminal according to the production from coal mines and rail capacity. In other words, under this model, there is no need to build stockpiles specifically for the vessels in the shipping stem. As a result, the rail system is able to operate more independently of (and therefore be optimised in isolation of) the port when compared to a cargo assembly environment.

The key difference between these operating modes relates to the intensity of the operational interface that exists throughout the supply chain. Under a rail to stockpile approach, the rail system is largely able to optimise its own performance in contrast to a cargo assembly environment where the rail system is instead required to constrain its own performance for the benefit of the improving utilisation of available port terminal capacity and the supply chain as a whole. A consequence of this is that in a cargo assembly environment, a given rollingstock fleet will carry less coal (all else being the same) than it will operating in a rail to stockpile environment.

This difference is crucial and explains some of the co-ordination difficulties that have emerged in coal supply chains during the recent sudden expansion that has been experienced. This is because both Port Waratah Coal Terminal and Dalrymple Bay Coal Terminal have migrated towards cargo assembly in response to the challenges presented by meeting increased demand whilst operating with confined (and not easily expanded) stockpile capacity at the port.

The capacity of the supply chain at any one time is a function of the most constrained element of that chain. The first step in optimising supply chain performance is ensuring that the capacity of each of these components, defined according to a uniform and realistic set of operating assumptions (that is, assumptions that reflect the reality of

operations on a day to day basis), is sufficient to deliver the desired level of system capacity.¹⁰

Where does the problem present

Our review of the contractual interfaces identified a number of gaps. The key gaps and their impacts are summarised in

¹⁰ This in turn does not imply that the capacity of each component needs to be equivalent. For example, in a cargo assembly operating mode it may be necessary to maintain some surplus capacity in rail relative to port capacity.

NTC

Table 1.

Table 1 Contractual gaps

Gap	Impact
Producers' contracts with end customers do not specify shipping arrangements (such as the timing of ship arrivals)	A lack of information on the timing of ship arrivals impedes scheduling at the port, which will also impact above-rail scheduling. This can have a significant impact on the efficiency of operations, particularly under a cargo assembly operating mode.
No contract between above-rail and port (terminal operator and port infrastructure services provider)	As the above-rail operator and port terminal operator each hold a contract with the mine but not each other, it complicates the management of scheduling and operations at the port (which is particularly critical in a cargo assembly environment). A contractual interface between above-rail and the port infrastructure services provider would also facilitate the coordination of expansions.
No contract between below-rail and port infrastructure provider	A contractual interface would ensure consistent capacity assumptions between below-rail and port, which is critical to enable optimisation of supply chain performance and planning. No contractual interface can also result in capacity expansions being conducted in isolation, leading to a misalignment of supply chain capacity.
No contract between shipping and port terminal operator	Impedes the development of accurate operational schedules. Variability in shipping activities can have flow-on effects throughout the supply chain, particularly under a cargo assembly operating mode.

In our view, the key area where there is greatest potential for a lack of contractual alignment is between below-rail and the port (both the terminal operator and infrastructure owner, presuming they are separate). The feedback we received in the consultation is that if this alignment was achieved, there would be sufficient incentive on above-rail operators to align their contracts given they operate in a competitive market environment. Whether or not an interface agreement is required between these parties is less clear (in some cases, alignment of regulatory instruments may be more effective) – what is required is a mechanism to ensure that the various elements that comprise the supply chain operate (and plan) in a manner which is compatible with achieving supply chain efficiency.

In practical terms the 'focal point' for the alignment of capacity is generally the port as it is the capacity at the port which is the most expensive to expand in the supply chain. Consequently, the starting point for capacity assessment is the tonnes that are able to be shipped from the port. Once this has been determined, the capacity required in each of the other components in the supply chain can be assessed to enable the delivery of those tonnages to the port.

Because there is no holistic view of capacity across the supply chain as a whole, the mismatch in capacity assumptions is an issue across the entire system. Ideally, this holistic view would need to encompass capacity at the port, above-rail and below-rail, as well as mine outloading capability.

Much of the discussion in supply chains is focussed around where the capacity constraints might be at any one point in time. For the purpose of this review the key

issue is not where the next constraint will be as the bottleneck will shift to differing elements of the supply chain as overall capacity increases. Consequently, if a holistic view of supply chain capacity is not taken and alignment is not achieved, constraints to increasing throughput could emerge anywhere in the supply chain at any point in time. Hence there needs to be sufficient co-ordination to this expansion process to ensure that the various elements of the supply chain are expended together so as to minimise the risk of hold up occurring (where investments are effectively “stranded” for a period until the capacity of other supply chain elements “catch up” or align).

What are the impacts

There are a number of consequences of the lack of alignment, although they are all closely related. These consequences are summarised in Table 2.

Table 2 Consequences of lack of alignment

Impact	Why	How would alignment address this
A lack of alignment undermines accountability	<ul style="list-style-type: none"> - A lack of alignment creates and perpetuates silos. - No clear responsibilities or consequences for performance failures. - No accountability means limited (if any) incentive to improve performance. - Difficulties in attributing where responsibilities for failures lie. 	<ul style="list-style-type: none"> - Responsibilities and accountabilities more transparent. - Contribution to supply chain performance (both positive and negative) is more transparent. - Could be strengthened by the inclusion of financial incentives (although is not seen as a necessary condition to improve accountability). - Could also facilitate the use of price signals to inform capacity consumption and trigger the need for expansion.
A lack of alignment can lead to capacity constraints and/or impede their resolution	<ul style="list-style-type: none"> - Absence of uniform assumptions for supply chain capacity can lead to a misalignment of capacity amongst participants. - More difficult to accurately diagnose the cause of capacity constraints. - More difficult to anticipate where constraints might emerge and ensure that investment occurs in the right element of the supply chain in the right sequence. 	<ul style="list-style-type: none"> - Facilitates an understanding and assessment of supply chain capacity. - Causes of capacity constraints are more transparent. - Facilitates holistic long-term planning to identify the timing and sequence of capacity expansions. This in turn should reduce the likelihood of protracted constraints.
A lack of alignment impedes the ability to optimise existing supply chain capacity	<ul style="list-style-type: none"> - Lack of accountability and limited incentives to improve performance. - More difficult to implement operational improvements. - Lack of transparency in relation to the key drivers of operational problems could mean that initiatives to increase throughput are mis-targeted. 	<ul style="list-style-type: none"> - Improves accountability for contribution to supply chain performance (could be strengthened by the use of modest financial incentives). - Aligned contracts provide a platform for managing operational issues and implementing initiatives to optimise performance.
A lack of alignment can facilitate, or encourage, gaming in the system	<ul style="list-style-type: none"> - Lack of accountability and limited incentives to improve performance. - Lack of transparency can impede identification of where gaming might be occurring. 	<ul style="list-style-type: none"> - Improves transparency (that is, more evident if over-contracting is occurring and where). - Facilitates imposition of financial incentives/penalties.

The consequences of a lack of alignment depend on the demand environment and the demand-supply balance in the supply chain. If capacity is constrained, the consequences of under-utilisation of capacity or a lack of available capacity are more serious (being lost sales). Under-utilisation may also arise because capacity has been hoarded, which could impact on the ability of other producers (or new entrants) to access valuable system capacity. In this case retaining more capacity than is needed is seen as a valuable means of securing competitive advantage, to the potential detriment of others. Uncertainty in relation to future supply chain capacity can also lead to over-contracting as participants seek to ship additional tonnes if needed.

The other issue that can arise is where one user's consumption of capacity imposes costs (or externalities) on others. This was raised as an issue in the Hunter Valley, for example, with a number of participants citing the example of where a producer can exchange capacity allocations between mines that are located different distances from the port, which in turn will have different implications for the consumption of supply chain capacity. This cost is borne by other participants via reductions in rail capacity.

More subtle manifestations of the same problem arise elsewhere in the supply chain, such as where mines establish different loading and recharge capacities at the mine loadout (where mines load trains). Differing load out capacities have implications for the train cycle times (greater loading capacities allow faster loading of trains) and the number of yard equipment moves that are ultimately required at the port terminal. Optimal supply chain performance is likely to be achieved when mine loadout and recharge capacities are synchronised with dump station unloading capacity at the port.

Existing mechanisms to address these problems

This is examined in Chapter 4.

3.3.3 Information gaps

Description of the problem

The essence of supply chain co-ordination is information about each element of the supply chain and how those elements interact. Without an understanding of the capacity of the entire supply chain it is extremely difficult to know where the capacity constraints are likely to emerge and how they should be addressed.

Accordingly, imperfect information is one of the key causes of supply chain co-ordination failure. Particularly given the number and complexity of the interfaces, the unimpeded flow of information is essential for the supply chain to function efficiently and for each participant to be accountable for its performance.

The service providers in the supply chain all ultimately depend on the mines for accurate information regarding expected throughput. This is necessary for scheduling and day to day operations, as well as capacity forecasting and planning. Information also needs to be exchanged between:

- mines, above-rail operators, below-rail network owner and the port terminal operator (for operations and scheduling);
- mines, above-rail operators, below-rail network owner and the port infrastructure provider (for capacity forecasting and planning); and
- mines, port terminal operator and shipping (for operations and scheduling).

Contractual commitments provide the foundation for this information exchange (but less formalised arrangements are also used).

Where the supply chain consists of a number of different members, information is dispersed and needs to be able to be coalesced to facilitate planning and operations. This situation is exacerbated where participants are operating as silos in the supply chain with a limited sense of common purpose or the impact of each element on the overall performance of the supply chain.

Where does the problem present

In the consultation a number of producers asserted that information regarding expected shipments has high commercial sensitivity in their competitive market environment. There is a natural reluctance to share this information as doing so can undermine the mine's ability to benefit from the information asymmetry. There can be incentives for mines to exploit these information asymmetries in contractual negotiations (for example, by contracting for more capacity than is needed to reduce the capacity available to competitors).

Feedback received in the consultation confirmed that this is a significant issue. For example, even in the DBCC coordination model, where information is provided on a confidential basis, the Central Coordinator indicated that it still only has information regarding future shipments for a very short horizon. Moreover, information concerning mine loadout capacity has also proven elusive to improving supply chain co-ordination.

Apart from the confidentiality issues, there is a problem in relying on information from the mines for long-term planning. If mines are providing such information they will be making an assessment of both their productive capability and expected market share. If more than one mine is making assumptions about business from the same customer,

tonnages will be double counted (although they may also be making very different assumptions about demand from different customers).

Inaccurate information regarding the capacity of supply chain infrastructure is also a significant problem. This emerges as a consequence of individual elements of the supply chain stating “nameplate” capacities for the element in isolation. This creates two concerns:

- first, the assumptions underpinning the assessment of the nameplate capacities of the various elements in isolation are inconsistent;
- secondly, and more importantly the statement of capacity is not made on a whole of system basis – that is how each of the other elements of the supply affect the utilisation of capacity of every other element. This in turn is largely driven by the lack of alignment, which was discussed above.

What are the impacts

The impacts of information gaps are summarised in the following table.

Table 3 Consequences of information gaps

Impact	Why	How information would address this
Information gaps impact short-term operations and performance	<ul style="list-style-type: none"> - Impedes the ability to maximise throughput in the short-term. - Lack of information regarding the clear causes of failure limits improvements that can be made to supply chain performance. - Lack of information regarding the clear causes of failure perpetuates the ‘blame game’ culture, which ultimately detracts from the achievement of a common purpose in the supply chain. 	<ul style="list-style-type: none"> - Accurate information is essential to optimising supply chain performance in the short-term as it maximises the ability to plan and enables schedules to be optimised. - Information regarding the causes of failure reduces the ‘blame game’ and can lead to constructive initiatives to improve future performance.
Information gaps impede long-term planning	<ul style="list-style-type: none"> - Lack of robust information on future supply (and demand) impacts the horizon of planning and the confidence in any capacity projections. 	<ul style="list-style-type: none"> - Quality information facilitates long-term planning and decision-making.
Information gaps can impact revenue certainty	<ul style="list-style-type: none"> - Where annual revenue requirements of regulated providers are set with reference to volume forecasts, information gaps can increase the likelihood that actual revenues will be above or below forecast. Under a revenue cap this will trigger revenue adjustments that may not have been anticipated by users. 	<ul style="list-style-type: none"> - While actual volumes may still deviate from forecasts, addressing information gaps could reduce the probability that this deviation was simply due to poor information. - This issue is not considered as significant as the other impacts.

Information is fundamental to long-term planning and the ability of the system to anticipate and develop appropriate investment in supply chain capacity. Given the long lead times involved in developing new capacity (including acquiring

rollingstock), any failure in integrated planning can (and indeed has) resulted in system bottlenecks.

Inaccurate information could also lead to overinvestment in capacity, which in turn exacerbates asset stranding risk. This will primarily impact infrastructure providers if they are unable to earn a full return on, and return of, the capital they have invested. It can also impact users if they have underwritten the investment, that is, they will pay for infrastructure that is not used, which could reduce their competitiveness in the market.

In highlighting these issues it is of course recognised that even with good information, the ability to get this capacity balance right will always be challenging, given the dynamics of the coal supply chain as well as the uncertainties in the external environment such as the inherently volatility in the coal market with future demand being difficult to predict with any certainty.

Existing mechanisms to address these problems

Being able to provide information confidentially to central coordinators should largely address producers' legitimate concerns regarding the sensitivity of the information. The establishment of the Hunter Valley logistics team as an independent body should facilitate this in that supply chain.

As noted above, however, the DBCC Central Coordinator still cited issues in being able to obtain information. The Coordinator does not have the authority to compel participants to provide information.

There will clearly be a gap if not everyone in the supply chain participates in central coordination. The central coordinators currently rely on cooperation and participants can 'opt out'. This is a consequence of the voluntary model (largely favoured by industry participants) that has been adopted which does not provide Central Coordinators with the authority to compel information from participants (on a commercial in confidence basis), even though there may well be a clear benefit to the supply chain from Central Coordinators being able to access that information.

The central coordinators are also playing an important role in analysing and reporting the causes of short-term operational failures. This has been a key focus of the early days of the DBCC Central Coordinator, for example, and this is seen as significant improvement. The attribution of causes for loss of capacity is well advanced in the Hunter Valley supply chain. The fact that these failures are now discussed, analysed and reported could improve accountability and provides considerable incentive on participants to improve performance.

The Master Planning forums also provide an important vehicle to assess long-term capacity requirements. Organisations such as ABARE provide an independent source of information on expected future demand, as well as supply, as does private sector forecasters and market analysts. The fact that user endorsement of future expansions must generally be agreed also provides an important mechanism to engage them in the strategic planning process. However, it will not fully address information gaps.

Where volume risk is borne by end-users this may also provide some incentive on these end-users to ensure that the volume forecasts are reasonable. A key mechanism for this is a take-or-pay provision in contracts, which was described above. The revenue cap arrangements in place for the regulated infrastructure businesses will also provide some incentive (noting that the regulator is the one that ultimately approves the forecasts).

4 Status of each Supply Chain

The coal boom largely caught participants by surprise. The coordination problems in the supply chains have really only emerged when capacity has become constrained. However, it is also evident that participants should not wait for capacity to become constrained before putting a framework in place to be able to optimise supply chain performance. Historical performance has masked inefficient utilisation of available capacity (as seen by the throughput increases initially achieved by the HVCCLT).

As noted previously, initiatives have been commenced in a number of the supply chains with a view to addressing the causes of coordination failure. These initiatives are in their relatively early stages of implementation. In some cases, the details of these initiatives are not publicly available. At this stage, while it is clear that the imperative to address coordination failure is now stronger in the systems where the main problems have emerged (particularly the Hunter Valley and Goonyella), it is extremely difficult to make any robust assessment of the likelihood of success. We can however, make some observations on the status of each system.

These observations are made in two main areas. The first is in relation to the current and future capacity of each supply chain. The second is the extent to which each of the four features outlined in section 3.1 are evident in each supply chain, or initiatives are in place to address them. This assessment is provided in the table below.

Table 4 Status of each supply chain

Issue	Goonyella	Blackwater/Moura	West Moreton	Hunter	Port Kembla
Supply Chain Capacity					
Port capacity	Port capacity at 85mtpa but untested	Port capacity at Gladstone adequate for existing commitments	Whilst port capacity is constrained, it is not expected to affect throughput given constraints that are present on rail system.	Expansion of port progressing (both PWCS and NCIG).	Adequate capacity at the current time but concerns regarding ability to accommodate future growth. Difficulty at the moment is being able to develop system-wide view of capacity (including future paths available to coal). Until this can be done, unable to determine if capacity needed is port and/or rail. Similarly, it is premature to assess whether the supply chain is operating as efficiently as possible.
Rail infrastructure capacity	QR Network undertaking expansions to increase capacity and accommodate cargo assembly operating mode. Capital projects are developed as part of Master Plan. About to be reviewed by QCA as part of the review of its access undertaking.	Rail infrastructure investment to address bottlenecks occurring	Constrained due to Brisbane metropolitan network and Toowoomba range crossing. These constraints cannot be easily addressed. Key alternative to address constraints is alternative route (ie Southern Missing Link).	Rail infrastructure likely to be the next bottleneck once port capacity completed. Expansions contemplated in ARTC's strategic plan but may be delivered with a lag relative to port expansions.	
Rail haulage capacity	Delivery of rollingstock understood to be occurring through 2009 and 2010.	Delivery of rollingstock understood to be occurring through 2009 and 2010	Rollingstock capacity not an identified constraint	Looming issue with expansions – it appears commitments on rollingstock may occur only after rail infrastructure commitments are secured	
Loadout capacity	Expected to be an issue in future co-ordination and expansions	Expected to be an issue in future co-ordination and expansions	Expected to be an issue in future co-ordination and expansions	Expected to be an issue in future co-ordination and expansions	
Status against the four features					
Operational coordination	Formal coordination managed by a Central Coordinator. This only includes DBCT (although it is understood that Hay Point Services provides information to the Central	Informal coordination has been initiated by the major infrastructure providers. This includes daily scheduling between above-rail, below-rail and the port (this is co-located).	We are not aware of any existing initiatives that are being undertaken in this system.	The HVCCLT has been in place since 2004. It has yielded significant operational improvements, although is still constrained by information problems (mainly from producers).HVCCC being	Has formed a group that now meets regularly to discuss planning and operational issues. This is represented by the majority of supply chain participants. Government agencies are also invited to participate. It

Issue	Goonyella	Blackwater/Moura	West Moreton	Hunter	Port Kembla
	Coordinator). The scope and responsibilities of the Central Coordinator will be examined as part of the development of the long-term solution.			developed.	appears that informational difficulties may stifle the effectiveness of operational coordination.
System wide master planning	QR Network and DBCT both produce their own Master Plans. While they consider the other parts of the supply chains, the focus of each plan remains on their own infrastructure. Master Planning is one of the areas to be addressed by the long-term solution. A Master Planning process has recently been initiated by the Central Co-ordinator	The Capricorn Coal Chain Maximisation project, again involving the major infrastructure providers, has examined ways to maximise existing supply chain capacity. As this has been considered quite successful they are looking at continuing this going forward, with a revised charter.		The HVCCLT is about to publish its first Master Plan. It is understood that all infrastructure providers cooperated in the development of that plan.	A Master Planning (strategy) group has been formed comprising representatives from the majority of the supply chain participants. This is only a recent initiative. The key challenge currently facing this group is assessing whole of supply chain capacity, and being able to forecast what paths will be available to coal going forward.
Contractual alignment	DBCT producers committed to develop a long-term solution to coordination problems as part of their application to the ACCC for authorisation of the extension to the queue management system. The producer's principles underpinning this solution were outlined in the application. Despite rejection of authorisation application, work to develop the long-term solution is continuing.	A whole of supply chain capacity review is currently being undertaken. However, the situation in relation to the alignment of contracts (or lack thereof) is the same as the other supply chains. We are not aware of any initiatives that are being undertaken to address this.		Details of contractual alignment to be developed as part of the long term solution for the ACCC (expected at the end of March)	Currently undertaking a commercial framework review to ensure commercial arrangements optimise whole of supply chain performance going forward.
System capacity assumptions throughout supply chain	To be addressed as part of the development of the long-term solution.	See above.		Details of contractual alignment to be developed as part of the long term solution for the ACCC (expected at the end of March)	Refer above. Attempting to assess this but need: (a) access to modelling capability (have requested help from the NTC); and (b) information re future paths

NTC

Issue	Goonyella	Blackwater/Moura	West Moreton	Hunter	Port Kembla
					available to coal.

5 The Role of Government in Coal Supply Chains

5.1 Existing Roles

Government currently performs a number of roles in the supply chain. They are summarised in Table 5. We received very limited feedback in the consultation in relation to issues with the existing role of Government. The key focus of the discussions was its future role.

Table 5 Existing roles of Government

Role	Description	Issues
Regulation and policy		
Economic regulation	<p>Economic regulation is one of the more visible (and potentially contentious) roles in the coal supply chain that can have a significant impact on the operations of the regulated infrastructure providers. The role is an important one given supply chain infrastructure (specifically below-rail and ports) may have natural monopoly characteristics, which in turn may necessitate the regulation of the pricing and/or terms and conditions of access.</p> <p>ARTC, QR Network and DBCT are currently the only regulated businesses in the coal supply chains. While the regimes share some common features, there are also some fundamental differences.</p>	<p>It is difficult to evaluate its effectiveness to date, although competition has emerged in the above-rail market. Prices are generally competitive and there is a greater focus on service quality.</p> <p>Potential issues include:</p> <ul style="list-style-type: none"> - objectives of access regulation do not reflect need to promote whole of supply chain outcomes; - currently, there is limited alignment between DBCT's and QR Network's undertakings; - regulatory risk can have a significant impact on investment; - while ring-fencing arrangements are important to instil confidence where there is vertical integration, this also has the potential to forgo any benefits that this integration can bring to optimising supply chain performance.
Regulation of NSW ports	<p>Ports in NSW are governed by legislation, including the <i>Ports and Maritime Administration Act 1995</i>. This legislation prescribes the objectives and functions of port corporations, has provisions in relation to safety and also governs pricing. A key requirement of the NSW Government is to ensure open access to port infrastructure.</p> <p>Amendments were recently announced (<i>Ports and Maritime Administration Amendment (Port Competition and Co-ordination) Bill 2008</i>) which include:</p> <ul style="list-style-type: none"> - definitions of the port-related supply chain (and include objectives and functions in relation to this); - allowing the Minister to make certain directions in relation to the exercise of any of its functions; - regulations to promote competition and productivity at ports. 	<p>While the ability to make directions was seen as providing Government with a necessary 'lever' to intervene in the event of failure, the circumstances under which this is likely to occur are unclear. Feedback from the consultation indicated that this is a source of concern for some participants as it creates uncertainty.</p>
Safety regulation	<p>Regulations relating to health and safety are non-discretionary. A significant focus has been placed on safety across all components of the supply</p>	<p>No evidence emerged from our consultation to suggest that there are any concerns with the</p>

Role	Description	Issues
	chain.	<p>existing Government regulations in this area.</p> <p>However, a separate review undertaken by Synergies for the Australasian Rail Association (ARA) noted the complexity of the current rail safety regulations and in particular, a lack of consistency between the various states and territories.</p>
Environmental regulation	<p>Environmental policy is another key area of Government involvement. Going forward, this will have the most significant impact on producers, particularly in relation to the future implications of the Government's climate change policies on the utilisation of coal and the cost competitiveness of Australian producers (although this will ultimately impact all participants in the supply chain if it results in a reduction in demand). The implications of this are currently uncertain.</p>	<p>We did not receive any feedback in the consultation to suggest that there were particular issues in relation to environmental regulations that need to be addressed.</p>
Circuit breaker	<p>The State Governments in both New South Wales and Queensland have already sought to intervene in response to the evident failures in the Hunter Valley and Goonyella coal supply chains, with the appointments of the Honourable Nick Greiner and Stephen O'Donnell respectively.</p>	<p>The circumstances under which Government will intervene need to be clear. This is discussed further below.</p>
Infrastructure funding and investment	<p>Recommendations have been made in previous reviews in relation to ensuring that Government removes any impediments to timely investment in essential infrastructure, including assisting in fast-tracking necessary approvals for projects.</p> <p>One of the key initiatives undertaken by Government is the establishment of Infrastructure Australia. In Queensland, the Coal Infrastructure Taskforce has been established to ensure coal supply chain infrastructure is sufficient to meet demand, although this role has more of a planning and coordination focus.</p>	<p>There was no feedback received in the consultation that suggested that the existing roles of Government were impeding investment in coal supply chain infrastructure, apart from the concerns in relation to regulatory risk.</p> <p>Feedback confirmed the view that industry was also willing and able to fund commercial supply chain infrastructure. Government funding is more likely to be in areas such as social infrastructure to support mining communities.</p>
Ownership	<p>Government owns port and rail infrastructure in New South Wales and Queensland. The rationale for Government ownership is historical. National competition policy reforms saw the corporatisation of a number of Government-owned businesses, including the infrastructure providers. Some businesses were also privatised.</p>	<p>Feedback received at the Brisbane workshop suggested that Government ownership was a source of tension, at least from the perspective of some of the participants.</p> <p>Views were expressed that the role of Government as shareholder can directly conflict with its role as planner and policy-maker. Further:</p> <ul style="list-style-type: none"> - these two perspectives are not necessarily clearly represented at the negotiating table; and - there was insufficient coordination of the shareholder perspectives where different Government Owned Corporations were involved in the same supply chain (an example given here was the development of the Northern Missing Link/Abbot Point expansion). <p>Not all participants supported these views.</p> <p>There was no feedback to suggest that Government ownership is currently a source of tension in New South Wales.</p>
Coordination and planning	<p>Overall, Government has played a limited role in facilitating supply chain coordination to date. However, it has sought to intervene where there is seen to be clear evidence of failure (Greiner and O'Donnell reviews).</p> <p>Two key existing roles of Government in relation</p>	<p>It is difficult to assess the effectiveness of the Federal and Queensland initiatives given they are both in their relatively early stages of implementation. We also noted that some of the Queensland participants in the consultation were unclear as to the role of the Coal Infrastructure</p>

Role	Description	Issues
Training	<p>to infrastructure planning and coordination is the establishment of Infrastructure Australia, which extends across industries, and the Coal Infrastructure Taskforce in Queensland (this is part of the Department of Infrastructure). The Department of Planning in New South Wales seems to have the primary responsibility in that State, although its current role in actively reviewing and planning the development of coal supply chain infrastructure was unclear.</p> <p>The Government currently has responsibility for the training of marine pilots. For example in Queensland, this is carried out by Maritime Services Queensland (MSQ). MSQ is also responsible for ensuring that all crew members of commercial ships are provided with necessary safety training in accordance with the <i>Transport Operations (Marine Safety) Regulation 2004</i>.</p>	<p>Taskforce. We also understand that there is a degree of coordination between the key Queensland Government agencies in relation to planning, particularly between Queensland Transport, Queensland Treasury and the Department of Infrastructure.</p> <p>It is understood that there is currently a shortage of marine pilots and this is an area where future Government funding (including training) may be required.</p>
Research	<p>The primary Commonwealth Government research body for the industry is the Australian Bureau of Agricultural and Resource Economics. Its main focus has been on demand and supply conditions in the coal market, including forecasting long-term demand, although it has also reviewed infrastructure requirements in the export coal supply chains.</p> <p>The Queensland Department of Mines and Energy and the New South Wales Department of Primary Industries also deliver research services for the coal industry, including providing information regarding mine developments and new projects.</p>	<p>While information gaps are at the core of the coordination problems in the coal supply chain, this is more a function of the willingness of producers to provide information, rather than any identified deficiencies in the role of Government.</p>
Taxation	<p>Both the Queensland and New South Wales Governments have recently announced increases in coal royalties in response to the strong demand conditions and high coal prices (and pressures on Government budgets).</p>	<p>Coal royalties, as with any form of taxation, have the potential to significantly distort outcomes in the market. The major concern is the potential impact on future investment, including the development of mining infrastructure.</p> <p>While industry has voiced strong concerns regarding the increases, it is unclear if and how it will impact investment. This in turn will be influenced by the level of future coal prices (and hence revenues) as well as the extent to which producers are facing cost increases in other areas.</p>
Other roles	<p>Government bodies also fulfil other important functions in the supply chain, including maritime services at the ports.</p>	<p>No issues were raised in the consultation in relation to these other roles.</p>

To date, Government involvement in coal supply chains has not been systematic – intervention has either been initiated following poor performance of the supply chain, the development of ports, or, in the case of ACCC determinations, following authorisation applications for capacity management systems to manage demurrage where there is a supply demand imbalance. If Governments are to become more involved in supply chains, with the threat of intervention, then it is important that Governments themselves become accountable for their actions. This is particularly

important given the clear preference for the coal mining industry and the service providers that form the logistics chain to resolve supply chain issues themselves.

5.2 Future roles

5.2.1 Overview

The strategic importance of coal to the Australian economy has been examined in other studies and will not be revisited here.¹¹ Overall, achieving optimal performance in the coal supply chains is in the public interest because of the significant economic benefits that it can deliver to the economy, both from existing producers as well as new entrant producers.

The consistent feedback received in the consultation was that Government's role in the supply chain is limited but nevertheless can (and has been) significant. The coal supply chain is a competitive commercial environment and it should be the responsibility of industry to develop and drive initiatives to address capacity constraints and optimise supply chain performance.

At the same time, there are inherent difficulties associated with an industry-driven solution, which arise from the intense competition among producers and the evident differences of opinion between them. The interests of any single producers may not align with improving overall supply chain outcomes.

This is where failures have the potential to emerge, which in turn may necessitate some form of Government intervention as Government can provide an effective circuit breaker. The opportunity cost of foregone throughput is high, not only in terms demurrage costs, but also the wider economic benefits that an efficient coal supply chain can deliver (such as maximising the contribution of the coal industry to national economic performance).

This finding is consistent with the general recognition in our consultation that Government still has a role in relation to supply chain co-ordination, although this is more likely to be based on facilitation rather than active participation. There was very

¹¹ For example, refer: Exports and Infrastructure Taskforce (2005), Australia's Export Infrastructure, Commonwealth of Australia; ABARE (2005), Infrastructure Issues in the Hunter Valley Coal Supply Chain, ABARE Report for the Australian Government Senior Officials Group on Coal Transport Infrastructure, Commonwealth of Australia; Senior Officials Group (2005), Delivering Reliable Australian Coal Exports to the World - Coal Transport Infrastructure, Department of Industry, Tourism and Resources; L. Fairhead, R. Curtotti, C. Rumley & J. Melanie (2006), Australian Coal Exports: Outlook to 2025 and the Role of Infrastructure, ABARE Research Report 06.15; Access Economics (2008), Infrastructure 2020 - Can the Domestic Supply Chain Match Global Demand, Report by Access Economics Ltd for the Minerals Council of Australia, 28 May.

limited feedback received on the effectiveness of Government's existing roles and no specific feedback to suggest that the existing role needed to be scaled back, with the exception of some concerns regarding the tensions that can be created by Government's ownership of coal supply chain infrastructure, which was raised by some participants in the Brisbane workshop.

Our overall conclusion from this is that coal supply chains should self-regulate with the threat of Government intervention where the industry fails to implement an effective solution. Coordination initiatives should be driven by industry and founded in commercial agreements. Self-regulation is possible because no single participant has the ability to gain at the expense of all other participants. However, self-regulation will depend on the industry achieving sufficient incentives and enforceable sanctions in its self-regulatory regime.

In our view, the key reason that coal supply chain participants have not successfully addressed the causes of coordination failure to date is because not all participants have perceived there to be adequate incentive to co-operate or because the costs (both in terms of transactions costs as well as competitive impacts) associated with reaching and implementing agreement are too high – at least for some participants. There could be individual winners and losers from a more cooperative approach. Those who perceive a risk that they will be worse off will be less willing to cooperate. In a capacity constrained environment there can be incentives to game rather than cooperate as access to capacity has considerable strategic value.

This incentive could be provided by the threat of Government intervention if industry fails to address the causes of coordination failure in a timely manner, as a Government-imposed solution could present a far worse outcome for participants. However, the threat of intervention needs to be credible and real. The ability of such a threat to incentivise cooperation has already been demonstrated in the Hunter Valley. Industry participants did manage to agree and document a solution (facilitated by Mr Greiner), however this was subsequently rejected by the NSW Government and re-negotiated to be consistent with the Government's objectives in relation to new entrants.

In our view, the key role for Government is to monitor the supply chains and provide a credible threat to intervene, and be prepared to intervene, if self-regulation fails. In the remainder of this chapter we will discuss the rationale for each role and the key principles underpinning it. The recommendations follow in Chapter 6.

5.2.2 Role of Government: Rationale

The key focus of this review is what the role of Government in the coal supply chains should be going forward, and the circumstances under which this involvement could

be triggered. Roles such as safety and environmental regulation and taxation are largely non-discretionary. Otherwise, the main roles for Government are seen as being in four key areas, being:¹²

- policy-making;
- economic regulation;
- planning;
- ownership; and
- planning.

Finally, it is also important to ensure that there is adequate coordination of these roles within Government, including managing its interfaces with supply chain participants in a consistent manner.

The overarching principle that should underpin the framework is ensuring that responsibility for decision-making is assigned to the party that is best able to make and be accountable for those decisions, which is generally the party that has the best information. Accountability is fundamental to the performance of the coal supply chains going forward.

Policy-making

Rationale

In addressing capacity constraints and supply chain performance, the key issue from a policy perspective is the extent to which Government should be involved in developing, implementing and managing the solution that addresses coordination failures in each of the supply chains (the causes of which were outlined in the previous chapter).

The policy process should be designed to identify the market and co-ordination failures affecting a supply chain and select the instrument that directly addresses the market failure. As discussed above, the forms of intervention available to Government are limited.

¹² In this respect it is important to distinguish roles from instruments. The instruments that Governments may deploy include regulation, information provision, service provision and using taxes and subsidies.

Matching instruments to address failures (whether they are market failures or co-ordination failures) is a complex exercise. The process is demanding of information and careful analysis is required if adverse unintended outcomes are to be avoided. Thorough policy analysis will consider and evaluate all options. This is especially important where existing interventions exist because the best solution might actually be to change existing interventions. Because of the underlying differences in supply chains, responses need to be tailored to each supply chain. Global solutions will only be successful if each supply chain is experiencing the same problems.

An important caveat to market intervention is the problem of government failure, that is, the intervention actually makes the problem worse. Government failure can occur because the instrument chosen does not address the market failure and/or because the cost of intervention exceeds the benefits. This point reinforces the fact that intervention must be supported by adequate analysis.

Addressing coordination problems in supply chains

The need for a 'solution' assumes that there is failure or the clear potential for failure. As noted above, while the underlying drivers that can lead to failure are common across the supply chains, the nature and extent of that failure varies. Overall, there is evidence of failure where:

- the reasonable requirements of participants in the supply chain (such as mines seeking to have contracted commitments fulfilled) are consistently not being met; and/or
- the requirements of key stakeholders (i.e. Government) are not being met. These requirements will relate to broader public interest considerations.

It is clear that some form of coordination is necessary to address both the lack of alignment of commercial objectives amongst supply chain participants and information gaps. In particular, the solution should address the four key features of a well-functioning supply chain outlined previously, which are:

1. operational coordination between all elements of the supply chain;
2. contractual alignment and accountability for performance, so that operational assumptions underpinning contractual obligations are consistent throughout the supply chain and reflect actual performance;
3. whole of supply chain planning (whether by a single entity or being coordinated by an individual service provider adopting agreed and common operational planning assumptions); and

4. a contractual framework that allows for the expansion of the capacity of the supply chain to be underpinned by contracts with current and future producers.

Given the differences between supply chains, the solution needs to be tailored to its specific needs. For example, whether it requires the establishment of an independent, central coordinator or can be done more informally depends on the characteristics of the supply chain, the pressures it faces and the nature of the relationships that currently and will be expected to comprise it (including the ability to ensure ongoing compliance with system principles and rules). We are of the view that the participants in each supply chain need to have the opportunity to determine the most appropriate solution, at least in the first instance.

Moreover, it is important to recognise that the reform of supply chain co-ordination is likely to be evolutionary. This is no different to the reforms that have been experienced in other infrastructure industries in Australia where arrangements have been continuously improved and refined in response to market challenges and greater sophistication in the underlying metrics have emerged. In this regard, it is better that modest gains are secured in the short term through supply chain improvement processes bringing greater alignment and accountability to supply chain participants noting that greater gains can occur over time as the arrangements evolve and further improvements are effected.

Failure to adequately address coordination problems could occur for a number of reasons, including:¹³

- there is inadequate commitment to developing a solution (or a lack of a consensus on the nature and extent of the problem and the need for it to be resolved). This risk is considered particularly high in those systems that may not yet have experienced capacity constraints but have the potential to do so in future;
- industry embarks on the development of a solution but is unable to agree to it in a reasonable timeframe; or
- industry agrees a solution but it is not compatible with the requirements of Government.

If this occurs, Government may then have a role in facilitating an outcome. The nature of this role, and the circumstances under which it is triggered, is outlined below.

¹³ It should be noted that supply chain co-ordination solutions may take considerable time to fully implement due to the "overhang" created by long term contracts, particularly in Queensland.

Principles underpinning Government involvement

The key principles underpinning the role of Government in addressing coordination failure are as follows:

1. Each relevant Government is likely to have public interest objectives in relation to the coal supply chain, as well as minimum requirements for supply chain coordination, that need to be articulated and communicated to industry upfront (these are outlined below).
2. Coal supply chains should self-regulate. Industry should have fundamental responsibility for developing, agreeing, implementing and managing any solution to failure in the coal supply chain. This solution needs to be:
 - based on the four features outlined in the previous section;
 - compatible with the reasonable requirements of supply chain participants; and
 - compatible with Government's public interest objectives.
3. If this does not occur, there is a role for Government. This role could include one or all of the following (depending on the progress that can be made by industry in each supply chain):
 - being a catalyst for the development of a solution where there is a clear risk of, or evidence of, failure and industry has not embarked on the development of a solution;
 - facilitating the development of a solution where industry has been unable to agree one (based upon its objectives, as discussed below); or
 - as a last resort, imposing a solution where it is clear that industry agreement will not be able to be reached within a reasonable timeframe.
4. Government may also have a role in enabling key aspects of the solution. For example, this might include requiring supply chain participants to provide information to bodies appointed to coordinate activity in the supply chain on a commercial-in-confidence basis.
5. Otherwise, Government's ongoing role will be limited.

Objectives of Government

While each State Government needs to confirm its objectives in relation to the coal supply chain, we would propose that they will fall under two main areas, being:

- maximising the economic value of the State's coal resources, which in turn can be achieved by:
 - ensuring adequate investment in coal supply chain infrastructure; and
 - optimising the performance of the supply chain (or, maximising the efficient utilisation of existing capacity); and
- ensuring there is effective competition in relevant markets, which in this case will be the market/s for the supply of coal and the above-rail market. This objective is integral to the first, given that a key purpose of promoting competition is to drive efficiencies and maximise the overall value of coal exports. This will also be of particular interest to the regulators.

We would not expect vastly different positions from the respective State Governments in this regard. If this was the case (which we consider highly unlikely), the Federal Government may need to intervene to develop a common set of objectives to ensure that there is an appropriate degree of consistency on a national level.¹⁴ We would recommend that these common set of objectives are based on the two areas outlined above.

Economic Regulation

Rationale

The scope of regulation in the supply chains is currently limited and the increased regulation of ports has already been considered and rejected in Queensland and New South Wales. However, where infrastructure providers are regulated it provides an extremely important vehicle to promote whole of supply chain outcomes and improve coordination.

Regulators are limited in what they can achieve. Regulator-imposed outcomes do not necessarily provide the best solution. For example, a regulator may specify certain requirements in relation to Key Performance Indicators that might be seen as desirable in theory but are not achievable in practice because of the complexity of the supply

¹⁴ We note that the ACCC has not comprehensively articulated in requirements for a long term solution in response to the authorisation applications that have come before it.

chain interfaces. The emphasis should therefore be placed on the role of the regulator being to review the appropriateness of industry-driven solutions to coordination failures but it should not dictate that solution.

Principles

Industry should therefore still be responsible for developing and implementing solutions to optimise supply chain performance. However, the role of the regulator needs to be compatible with this. This could occur in a number of ways.

The first is to clarify that regulators should have explicit regard to the role of regulated infrastructure in the supply chain rather than for the regulated infrastructure in isolation. Economic regulators have an important role in ensuring that co-ordination arrangements that are developed are compatible with legislative provisions and become mirrored in regulatory instruments such as access undertakings.

A key way this can occur is to reflect it in the objects clause that governs regulatory regimes. This objects clause requires that regulation should promote the efficient utilisation of, and investment in, the relevant infrastructure. This could be expanded to define 'infrastructure' as 'supply chain infrastructure'. This would be best dealt with via COAG as part of the ongoing development of the *Competition and Infrastructure Reform Agreement*.

Second, to the extent that infrastructure in a supply chain is regulated, a single regulatory body (be it the ACCC, the QCA or IPART) should regulate all of the elements of the supply chain and the regulatory regimes should take a consistent approach to ensuring whole of supply chain outcomes.

Finally, as a last resort, access regulation could be initiated where an unregulated service provider in a supply chain fails to actively participate in improving system coordination.

Ownership

Rationale

There is a long history behind Government ownership (and divestment) of essential infrastructure. Government's ownership of supply chain infrastructure can influence capacity constraints and supply chain performance in a number of ways:

- the commercial objectives of the business will drive planning and decision-making. Government can also use its ownership to influence broader objectives in relation to economic development;
- it can influence the interfaces between participants and the way they interact.

Feedback received from some of the participants in the Brisbane workshop was that Government's ownership role was also a potential source of tension, as it was seen to conflict with its roles of policy-maker, planner and regulator.

The question for this review is not whether Government should or shouldn't own supply chain infrastructure (as this has considerably broader implications), but rather how this role can influence outcomes in the supply chain. There are two main ways it can do this by:

- managing the potential conflicts (actual or perceived) between its interests as a shareholder and its other roles; and
- simplifying the number of different interfaces in the supply chain, which in turn can increase the levels of accountability in service delivery.

In relation to the second point, formal integration of relevant Government-owned businesses is one way this could be done. This could yield significant benefits in terms of reducing the number of interfaces and integrating key aspects of supply chain operations and planning. However, there are a number of other considerations that would influence whether such a reform was optimal from the perspective to the wider commercial interests of these Government owned businesses. For example, it may be possible to implement this in one supply chain but not others depending on who owns the port. Government-owned rail businesses operate across supply chains so issues will arise if integration can be achieved in one supply chain. A comprehensive cost benefit assessment of all of these tradeoffs would be required.

Principles

The overarching principle here is that to the extent possible, Government uses its ownership of supply chain infrastructure to show leadership and cooperation to improve supply chain efficiency. This can be done by:

- appropriately reflecting whole of supply chain outcomes in commercial objectives; and
- simplifying the interfaces between participants in a manner that improves supply chain performance.

Planning

Rationale

The development of an integrated whole-of-supply chain Master Plan is fundamental to ensuring that adequate supply chain capacity is in place to accommodate expected demand, which in turn requires the optimal sequencing of expansions with sufficient lead time to avoid bottlenecks emerging. This plan needs to be based on a consistent set of assumptions in relation to supply chain capacity.

Government has an interest in ensuring adequate investment in coal supply chain capacity given:

- a competitive export coal supply chain; and
- the reliable transportation of coal for domestic uses,

is in the public interest. The desire by Government to ensure that this has occurred is reflected in previous reviews that have been undertaken, some of which have specifically focussed on the coal transport infrastructure and others that have been at a broader level. For example, the Queensland Government established its Coal Infrastructure Taskforce “to ensure coal-related infrastructure meets the demands of Queensland’s growing coal industry.”¹⁵

Government also has a role in ensuring that any impediments to investment are removed. Achieving a simpler, consistent and national approach to the economic regulation of infrastructure was the primary purpose of the *Competition and Infrastructure Reform Agreement*, which was assented to by COAG in 2006. Government can also assist by coordinating information provision and decision-making between its various agencies, including facilitating the resolution of issues beyond the scope of the coal supply chain (for example, how many paths will be available to coal traffics in the future on multi-user systems such as Port Kembla and West Moreton).

Government’s interest in planning should be at a strategic level (this was confirmed by feedback received in the workshops). Overall, planning within the coal supply chain should continue to be driven by supply chain participants. The Coal Infrastructure Taskforce, for example, made it clear that Government does not see its role as supplanting the role of industry in initiating and developing new proposals.

However, there is a planning related role for Government in relation to:

¹⁵ Queensland Government, <http://www.dip.qld.gov.au/growth-strategies/coal-infrastructure-taskforce.html>.

- facilitating any co-ordination that may be required between supply chains (particularly as it relates to providing information about the suitable locations of future ports); and
- providing clarification about the extent of capacity available to coal based movements in coal supply chains where the infrastructure is servicing several different industries and where planning issues extend beyond the immediate scope of the supply chain.

Whilst supply chain planning should remain the responsibility of supply chain participants (together with the co-ordination mechanism that is adopted), Government may have a role in assisting the co-ordination of supply chain planning across systems. This is because it is becoming clear that the development of coal transport infrastructure is increasingly involving the expansion for the industry as a whole (rather than on a supply chain by supply chain basis).

It is reasonable to expect that the supply chains may be able to co-ordinate cross system planning in isolation of Government involvement. In this instance, the role of State Governments may be limited to providing information concerning the wider planning environment as it affects the industry, particularly in relation to the location of new ports to meet expansions. Governments also have a role in facilitating cross system planning in the absence of the supply chains successfully co-ordinating these activities.

Finally, in systems that serve industries other than the coal industry, State Governments have a responsibility to clarify the extent to which the coal industry may access available system capacity to accommodate future growth. Again, this is an issue of State Governments clearly indicating how limited rail and port capacity is to be allocated amongst competing uses so that such limitations can be addressed through coal supply planning processes.

It is therefore important to delineate when Government needs to be responsible for decision-making and when it needs to be an informed participant to facilitate wider whole of State planning. To date, Government has not necessarily taken a systematic approach to these so there is benefit in having this formalised.

Principles

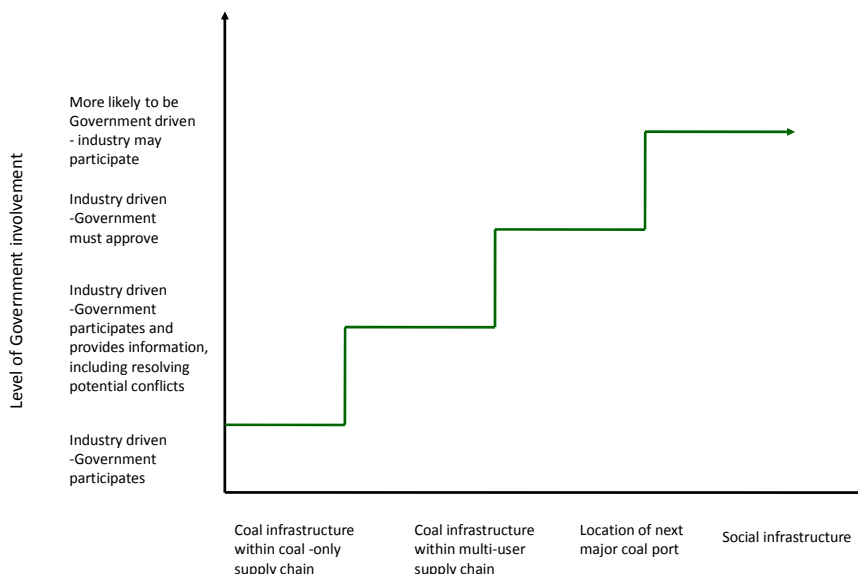
The key principles underpinning Government's role in planning in the coal supply chain are as follows:

1. Government's involvement in planning should only be at a strategic level.

2. Government's role in strategic planning in the coal supply chain is limited to one of participant rather than decision-maker. Where Government will need to have a more significant role is where the issues extend beyond the immediate scope of the coal supply chain (for example, where cross system planning is not effective or where at least part of the network is shared with users other than coal).
3. Where appropriate, Government can also assist by:
 - removing impediments to investment where appropriate; and
 - coordinating information provision and decision-making between its various agencies, including facilitating the resolution of issues beyond the scope of the coal supply chain. Facilitating coordination within Government is subject to a separate recommendation below.
4. Government should also ensure that whole of supply chain planning is encouraged by the regulatory frameworks. Specific recommendations in relation to regulation are provided below.

The level of Government involvement in strategic planning is summarised in the following figure.

Figure 1 Scope of Government involvement in strategic planning



The key levels of Government involvement are described in Table 6.

Table 6 Scope of Government involvement in strategic planning

Scope of planning	Role
Coal infrastructure within coal-only supply chain	Decisions in relation to planning and investment within the supply chain should be driven by industry. It would still be useful for Government to participate in these forums however it should not drive decision-making.
Coal infrastructure within multi-user supply chain	In multi-user supply chains such as Port Kembla and West Moreton, the future priorities of traffics competing for capacity can result in considerable uncertainty when attempting to plan future capacity requirements. Planning should continue to be driven by industry, however Government will need to be involved to provide information and facilitate the resolution of potential conflicts in a timely manner in order to provide sufficient certainty (for example, confirming how many paths are required for passenger traffics).
Location of next major coal port	Planning the location of the next major coal port should also be industry driven, noting that the proponent could be from the private sector or a Government-owned infrastructure provider. However, any proposal must be approved by Government. It should therefore be involved from the preliminary planning stage.
Social infrastructure	Social infrastructure is typically provided by Government. This is not necessarily always the case, however, with both mines and infrastructure providers having made considerable investments back into their local communities. It would be expected that such initiatives would still be undertaken in consultation with State and local governments.

5.2.3 Coordination within Government

Effective interactions between industry and Government require a coordinated response from each side. We received limited feedback on the consultation in relation to the effectiveness of coordination within and between Governments so we do not have any specific examples of failure to point to here. We found it difficult to identify all of the relevant agencies in the New South Wales Government, for example, and while this on one hand limits our ability to make an informed assessment, it is also potentially symptomatic of the problem.

Participants in the Newcastle workshop indicated that there would be benefit in Government providing a central point of contact which serves as the key interface with industry and acts as a conduit to the relevant agencies. This would also be of benefit to supply chains such as Port Kembla, which is facing planning issues that go beyond the scope of the coal supply chain.

The roles outlined previously will in most cases be fulfilled by the relevant State Governments. It is important to ensure that responsibility for the relevant roles is clearly delineated and communicated to all industry participants and stakeholders.

In our view it is not necessary to establish a central point of contact within Government (as outlined above) although it may be considered beneficial. At minimum, however, there needs to be a single point of contact for each of the four responsibilities outlined above. The State Government should also ensure that any evident conflicts or tensions

between roles are resolved sufficiently to ensure that its responsibilities in relation to each role can be clearly and consistently discharged.

5.3 Implementation

5.3.1 Responsibilities

The Australian Transport Council would ultimately be responsible for overseeing the implementation of this process by each State Government.

Most of this should be able to be managed using existing resources. This is because most of the work will be done by industry. More significant involvement from Government would only be required if industry was unable to reach a solution.

This also reflects the fact that the recommendations are not seeking an additional ongoing role for Government. Instead, it is reshaping its existing role, particularly in relation to policy-making and planning.

5.3.2 Issues and risks

The key risk to the success of the proposed framework for the role of Government is that the degree of commitment across Government cannot be secured, mainly in relation to:

- specifying its requirements upfront (if any) ; and
- facilitating communication and coordination with the relevant Government agencies.

We are of the view that while this might be difficult, the ATC provides the ideal vehicle to secure this commitment. However, it is considered important to achieve this quickly, particularly given there is already a degree of momentum within industry to see these issues resolved (which is necessitated by capacity constraints and continuing demand growth). The criticality of the need to address capacity constraints in coal supply chains has been highlighted in a number of previous reviews and need not be restated here.

The current environment presents an important opportunity to achieve the necessary change. Supply chains such as Port Kembla are potentially on the 'cusp' of problems emerging. One of the most important requirements here is securing sufficient clarity in relation to network capacity that may be available to coal in the longer term (which

may require Government to facilitate). This clarity is needed as soon as possible for capacity planning.

The forthcoming regulatory reviews for QR Network (whose undertaking is due to expire in June 2009), DBCT (expiring in December 2009) and ARTC (who is expected to submit its undertaking to the ACCC in 2009), provides an important opportunity to implement the recommendations in relation to regulation. As the QCA has already embarked on its review process in relation to QR Network, this needs to be considered as soon as possible.

.

6 Recommendations

Our recommendations are for Governments to improve supply chain management in the coal industry in the following areas.

Policy

1. The features of an effectively functioning coal supply chain (Features) should include:
 - effective operational coordination between all elements of the supply chain;
 - contractual alignment and accountability for performance, so that operational assumptions underpinning contractual obligations are consistent throughout the supply chain and reflect actual performance;
 - whole of supply chain planning (whether by a single entity or being coordinated by an individual service provider adopting agreed and common operational planning assumptions); and
 - a contractual framework that allows for the expansion of the capacity of the supply chain to be underpinned by contracts with current and future producers.
2. The way in which the Features manifest in an effective supply chain co-ordination solution will vary with each supply chain (depending upon the nature and operation of that chain).
3. If State Governments have public interest objectives in relation to the coal supply chain coordination that require solutions to exhibit additional features, (Additional Features) those features need to be articulated and communicated to industry upfront.
4. Industry participants in each supply chain (including producers and service providers) should have primary responsibility for developing, implementing and managing a solution for that supply chain which adequately exhibits the Features and Additional Features based on its nature and operations (an Effective Solution).
5. Industry participants should appoint representatives of the supply chain (Representatives) to interface with State Government on the development and implementation of an Effective Solution.

6. State Government should monitor the progress of coal supply chain reform processes to ensure that Effective Solutions are developed and implemented within a reasonable timeframe. It is anticipated that development and implementation should be completed within 2 years.
7. The State Government's role should involve the following steps:
 - as soon as practicable informing the participants of each supply chain of:
 - the Features and whether there are Additional Features that State Government requires be incorporated into supply chain co-ordination arrangements;
 - the proposed timeframes for the processes outlined below (noting that these timeframes are considered indicative and that alternative timeframes might be agreed between Government and the Representatives);
 - Representatives of each supply chain should report to Government on the extent to which existing initiatives are underway to implement an Effective Solution for that supply chain within 2 months of being informed by Government of the Features and Additional Features required for each supply chain;
 - where a supply chain is able to demonstrate initiatives are underway to develop an Effective Solution, then within 24 months Representatives of that supply chain should be able to demonstrate implementation of Effective Solution;
 - where the Representatives of a supply chain are not able to demonstrate initiatives are underway to develop an Effective Solution, then:
 - within a further 6 months, the Representatives of that supply chain should develop and submit to Government principles and an implementation plan (Effective Solution Plan) for the development of an Effective Solution; and
 - within a further 18 months (Implementation Period) representatives of that supply chain should be able to demonstrate to Government implementation of the Effective Solution.
8. Representatives of each supply chain should report to Government on the status of implementation at 6 monthly intervals (or as otherwise agreed with Government) during the Implementation Period.

9. If at the end of the Implementation Period there are aspects of a Solution that have been agreed by participants but are not yet implemented, then a Plan should be developed to detail the steps and measures that will be taken to ensure that an Effective Solution emerges and is implemented.
10. If Government does not accept any aspect of an Effective Solution Plan or the implementation of an Effective Solution, it should engage with the Representatives and following discussions with the Representatives, if necessary:
 - specify the deficiencies and inform the Representatives of those deficiencies (having regard to the nature and operation of the supply chain); and
 - specify the process by which these deficiencies are to be resolved to Government's satisfaction.
11. If industry fails to meet any of these requirements, Government should intervene.
12. The nature of the intervention should be determined by the relevant State Government having regard to the extent of progress that has been achieved and the nature of the impediment or impediments that have emerged.
13. This intervention could include one or all of the following:
 - information – notifying supply chain participants if any aspect of a supply chain co-ordination solution does not adequately exhibit the Features or Additional Features and the nature of changes that would be necessary for this requirement to be satisfied;
 - facilitation – for example, as a catalyst (where there is a failure to initiate the process) or where the outstanding issues are well understood by supply chain participants;
 - expert mediation – where issues arise requiring the input of a person who possesses expertise and experience in the efficient operation of bulk supply chains;
 - arbitration or regulatory intervention - where it is clear that the industry will not be otherwise be able to reach an Effective Solution, the relevant State Government should intervene to:
 - establish an alternative solution, which would be imposed on the industry in the event that it does not develop an Effective Solution within a defined period; or

- impose a solution.
14. When intervening in a supply chain, the relevant State Government should consult with any economic regulator with active responsibilities in relation to the infrastructure that comprises the supply chain.
 15. Government should also intervene to overcome specific barriers to the development of an Effective Solution. For example, that might include requiring supply chain participants to provide information to bodies appointed to coordinate activity in the supply chain on a commercial-in-confidence basis.

Economic Regulation

16. COAG should modify the *Competition and Infrastructure Reform Agreement* to ensure that economic regulators have regard to the efficiency of the supply chain as a whole. This could occur by modification to the objects clause to:

...promote the economically efficient use of, operation and investment in, significant infrastructure, **within the context of the supply chain as a whole**, thereby promoting effective competition in upstream or downstream markets...”
17. Where more than one service provider in the same supply chain is regulated:
 - it should be by the same regulator. (There are no cases where this needs to be rectified at the current time.);
 - the relevant regulator should ensure that regulatory arrangements are compatible with the Effective Solution; and
 - the timing of regulatory processes should be structured so as to facilitate consistent regulation of the supply chain participants.
18. Existing mechanisms be retained to allow affected parties to initiate the application of third party access regulation to service providers who fail to actively participate in the development of an Effective Solution.

Ownership

19. Where Government is delivering services it should ensure that it is leading and cooperating to maximise supply chain efficiency. Government shareholders should ensure Government Business Enterprises have clear commercial objectives to ensure they act in a way that delivers whole of supply chain efficiency whilst not compromising their legitimate business interests:

- in the case of Government-owned businesses in Queensland, this could be included in their Statement of Corporate Intent. This could be done as part of their next annual review;
 - in ARTC's case, it could be written into the objectives contained in the Tripartite agreement between the Commonwealth, New South Wales Government and ARTC. This would require amendment to that agreement;
 - this should also be included in RailCorp's¹⁶ corporate objectives. It is noted that it also has a Statement of Corporate Intent, which is reviewed annually.
20. Any future major supply chain expansions involving more than one Government-owned corporation should be developed jointly between those businesses. (No such future developments are known at the current time.)

Planning

21. Information collected by Governments that assists in planning should be freely disseminated. In this respect:
- Government needs to undertake the planning required to facilitate coal supply chain Master Planning and communicate this to industry participants in a timely way. This means Transport Departments in the relevant jurisdictions provide the following information to the relevant supply chain participants:
 - information regarding the number of paths that will be available to coal traffics for at least the next 10 years for all supply chains;
 - information regarding the likelihood of any material change to coal's utilisation of the network beyond this timeframe. If this remains very uncertain, the Government could provide information on the nature and timing of its expected decision-making process.
 - State Governments to facilitate master planning processes by:
 - responding to requests as to the desirability of sites for new coal terminals; and
 - facilitating action to ensure that incompatible land uses do not locate in the environs of future port sites;

¹⁶ The Port Kembla rail infrastructure connects with RailCorp's mainline infrastructure.

- at the request of industry participants, State Governments facilitate cross supply chain master planning processes.

Implementation

22. State Governments establish clear responsibility for each of its roles in supply chains. This may, but need not, involve the appointment of a central contact for each role within Government (which may or may not be the same agency). This role would coordinate the various agencies within Government that have responsibilities for all or part of the supply chain with the purpose of:

- monitoring the performance of the coal supply chains;
- ensuring that Government undertakes any specific initiatives, or removes impediments, to improving supply chain performance, as outlined above;
- ensuring that necessary information is provided to facilitate planning; and
- participating in planning at a strategic level.

A National Transport Policy Framework

Vision for Australia's Transport Future

Australia requires a safe, secure, efficient, reliable and integrated national transport system that supports and enhances our nation's economic development and social and environmental well-being.

Transport Policy Objectives

To achieve this vision, Australia's Transport Ministers commit to the following policy objectives:

Economic: To promote the efficient movement of people and goods in order to support sustainable economic development and prosperity.

Safety: To provide a safe transport system that meets Australia's mobility, social and economic objectives with maximum safety for its user.

Social: To promote social inclusion by connecting remote and disadvantaged communities and increasing accessibility to the transport network for all Australians.

Environmental: Protect our environment and improve health by building and investing in transport systems that minimise emissions and consumption of resources and energy.

Integration: Promote effective and efficient integration and linkage of Australia's transport system with urban and regional planning at every level of government and with international transport systems.

Transparency: Transparency in funding and charging to provide equitable access to the transport system, through clearly identified means where full cost recovery is not applied.

Transport Policy Principles

Australia's transport policy framework is underpinned by the following guiding principles:

Infrastructure pricing: Sending the appropriate signals to influence supply and demand for infrastructure.

Competitive markets: Establishing competitive markets wherever possible to minimise the need for regulation.

Private sector: Involve the private sector, where it is efficient to do so, in delivering outcomes.

National regulation: A national perspective should be adopted where regulation is required.

National markets: Encourage national markets where possible.

Customer: Customer-focussed. Equitable access for all users.

B Participants in Consultation

B.1 Interviews

The participants in the interviews (face to face and telephone) are summarised below.

New South Wales	Queensland
ARTC	Anglo Coal Australia
Asciano	BHP Billiton Mitsubishi Alliance
Bloomfield Collieries	BBI (DBCT P/L)
Donaldson Coal	Coal Infrastructure Taskforce (Dept of Infrastructure and Planning)
Hunter Valley Coal Chain Logistics Team	DBCT Central Coordinator
Idemitsu Australia	Gladstone Ports Corporation
Newcastle Coal Infrastructure Group	Maritime Services Queensland
NSW Resources Council	Ports Corporation of Queensland
Port Kembla Coal Terminal	Queensland Competition Authority
Port Waratah Coal Services	QR Network
Other	Rio Tinto Coal Australia
ACCC	

B.2 Workshops

Brisbane	Newcastle
BHP Billiton Mitsubishi Alliance	ARTC
BBI (DBCT P/L)	Asciano
Coal Infrastructure Taskforce (Dept of Infrastructure and Planning)	Bloomfield Collieries
DBCT Central Coordinator	Hunter Valley Coal Chain Logistics Team
Felix Resources	Idemitsu Australia
Port of Brisbane	Newcastle Coal Infrastructure Group
Ports Corporation of Queensland	Newcastle Ports Corporation
Queensland Competition Authority	NSW Resources Council
Queensland Resources Council	Port Waratah Coal Services
Queensland Transport	QR National Coal
Queensland Treasury	
QR National Coal	

Brisbane

QR Network

Rio Tinto Coal Australia

Newcastle

At the request of the Port Kembla Coal Terminal, Synergies and the NTC also attended a meeting of the Port Kembla coal supply chain's strategic planning forum, which included ARTC, Asciano, BHP Billiton, Centennial Coal, Peabody Energy, Port Kembla Coal Terminal, Port Kembla Ports Corporation and Xstrata Coal.

B.3 Written submissions

Written submissions were also received from:

- Bloomfield Collieries;
- Centennial Coal;
- Maritime Safety Queensland;
- Port Kembla Coal Terminal;
- Port Kembla Port Corporation.

C Causes of supply chain failure

Logistics chain optimisation is a difficult task. This is due to the need to manage competing participant requirements whilst ensuring a systematic approach is used to the overall transportation task to optimise available capacity. At the heart of co-ordination and market failures are principal-agent concerns. The participants in the logistics chain (being separately owned infrastructure companies) will seek to protect their own interests rather than the interests of the entities that they are contracted to serve (the mines).

Supply chains are characterised by dynamism and complexity. In reality, in the past these complexities were less evident simply due to the fact that the available infrastructure was used less intensively, that is, the “fat” in the system masked the inefficiencies that existed. With the growth in demand for infrastructure and the push to achieve greater efficiency in each element of the supply chain, the nature of the complexities is being increasingly highlighted.

The purpose of this chapter is to explain the sources of failure based on the characteristics of supply chains.

C.1 Information and coordination

Overview of the issues

Logistics chains are dynamic. This is due to the material impact that a participant in the chain can have on the competitiveness of another chain participant, as well as the entire system.

The unimpeded flow of information between participants is therefore necessary for the coal supply chain to function efficiently. Failure to provide sufficient levels of information can result in poor coordination inevitably leading to inefficient capacity utilisation, inaccurate forecasts, demand uncertainty and high production costs. In terms of logistics chains which involve outputs which are difficult to measure and high levels of asset specificity, coordination is essential for timely investment.

Where a supply chain consists of a number of disparate members, information is dispersed amongst participants. Consequently, even leaving aside incentive issues, there are substantial transaction costs associated with incorporating and coalescing the information that is dispersed throughout the members of the logistics chain. There is a further challenge to achieve co-ordination between them.

Amongst other things, this means that it is generally not possible for any individual member of the supply chain (other than a well informed central co-ordinator) to accurately assess the impact of its behaviour (or the impact of any change to its behaviour) on the other participants or indeed the supply chain as a whole. This applies not only for the operation of the system at a point in time (operational efficiency), but also the efficient operation over time (having regard to investment).

For example, even comprehending the impact of a change to one element of a supply chain (say port operation) on the other elements of the supply chain requires considerable information concerning the nature of the change and the impact on operations. This highlights the difficulty associated with investment optimisation, not only for any element of the logistics chain, but more importantly for the timing and sequencing of investment across the logistics chain as a whole.

Moreover, the individual participants do not always have incentives to ensure the unimpeded flow of information. Indeed, at times members will find it to their advantage to withhold information from other members of the supply chain. This is clearly contrary to the effective operation of the supply chain.

Coal supply chain coordination is arguably one of the more difficult supply chains to coordinate because it is formed by a sequence of long life, high cost sunk capital assets. Capacity augmentations to meet an increase in demand are also affected by very long lags that are experienced in expanding complicated engineering structures such as port terminals.

Asset owners will also be wary of the risks of installing excess capacity. This risk is more pronounced in regulated markets where the risk of regulatory optimisation of assets further complicates investment decisions and timing. The instantaneous adjustment of capacity seen in many other markets is not achievable in coal supply chains.

Current evidence of this failure in the coal supply chains

Significant gaps in information is a fundamental problem in the coal supply chains. The efficient operation of the transport logistics chain depends on having accurate information regarding expected throughput. This is necessary to manage operations in the short-term, and will also inform investment decisions in the long-term.

The logistics chain depends on the mines for this information. However, mines will have an inherent reluctance to share this information, given they are competing in an intensely competitive market. There can also be a conflict between the marketing and operations' perspectives in the firm. For example, a mine may not want its end

customers to know about potential operational constraints that could limit production, as this might be seen to compromise its competitive position in the market.

It is understood that the supply chain coordinators are attempting to address this issue. Key to the success is ensuring supply chain coordinators maintain an appropriate level of confidentiality so that producers can be comfortable sharing information without necessarily being seen to be compromising their competitive position.

Coordination problems are therefore very closely related to this issue given it emanates from participants operating as silos. Apart from the existing problems in terms of being able to obtain the necessary information to inform supply chain decision-making, different participants in the supply chain can form different views from this information. For example, different views might be formed on the likely capacity of the system, which can also stem from different perspectives on how it should be measured (as outlined previously). This will clearly have implications for both operational planning and investment decision-making.

Coordination failures have been exacerbated in the current environment, given effective coordination is necessary to maximise the efficiency of the existing system, as well as ensure that investment occurs at the right time and in the right place in the supply chain.

Issues in relation to the latter are arguably the root cause of the capacity constraints in the coal supply chains in Australia. There is increasing recognition of the need to produce coordinated Master Plans however this is yet to occur in all systems (the current approach tends to involve consultation with all supply chain participants however this is still some way from a fully integrated planning approach). The Hunter Valley Coal Chain Logistics team is the first to produce an Integrated Master Plan.

What is evident is that a central coordination role is needed to be able to effectively address the issues and challenges posed by information and coordination failures.

C.2 Competitors

Overview of the issues

The tensions within a supply chain are exacerbated by the fact that the individual mines that it serves are in direct competition with each other for the coal export market. Producers are naturally incentivised to exploit information asymmetries in contractual negotiations which may result contractual mismatches, excessive transaction costs or even gaming (such as where producers contract for excess capacity to preclude the transportation of competitor loads).

Individual mines to seek to minimise the costs they incur, even if it means that this conduct increases the overall cost of the supply chain. The drivers on the mines as competitors with one another reinforce this outcome. Moreover, where elements of a supply chain are in competition with one another (such as competing haulage providers) the effects can be even more severe for system efficiency.

Logistics chains co-operation and co-ordination – rather than competition – is therefore essential for achieving efficiency.

Current evidence of this failure in the coal supply chains

There is evidence to suggest that the competitive behaviours of coal producers currently have the potential to exacerbate market failure. In an environment where capacity is or is expected to become scarce, users perceive capacity entitlements as a key source of competitive advantage (this is highlighted by the current debates surrounding the Newcastle port development).

This can lead to practices such as capacity hoarding (where the costs of not utilising the capacity are considered less than the potential risks of maintaining access to the capacity). Apart from the obvious impact that has on users who may have been able to utilise that capacity, this clearly compromises efficient operation and investment in the supply chain. It also has broader implications in relation to maximising the value of the resource, which is of benefit to the economy. At the same time, users with existing capacity entitlements do have commercial rights that need to be protected.

There are currently very limited (if any) incentives on participants to align behaviours to consider whole of supply chain impacts. Again, any such incentive is considerably weakened in the current environment where access to coal chain capacity has strategic value. Instead, at the current time behaviour is (naturally) driven by the desire to protect users' existing commercial positions. While the benefits in a more coordinated approach to operating and managing the supply chain may well be recognised, there is no incentive to align behaviour, particularly if rivals may not do so.

C.3 Pervasive externalities

Overview of the issues

An externality arises where a party imposes an unpriced (i.e. uncompensated) cost on another. A defining characteristic of the operation of a logistics chain is that the actions of each component of the chain can materially affect other components and thereby the operation of the entire system

Therefore, individual participants are susceptible to pervasive spillovers. For example, a rail operator may have crewing constraints that forces it to depart from a railing plan. The failure by the rail operator to present trains on time and in sequence at the dump station might require additional moves of stacker-reclaimers by the port operator, thereby consuming additional port capacity and imposing a substantial efficiency cost on the port operator (and in turn the logistics chain as a whole).

Similarly, in order for an investment in capacity expansion to have maximum impact on the capacity of the logistics chain may require changes to the operation of other elements of that chain. Again, this is an example of where optimal performance of an element cannot be considered in isolation, but rather needs to be considered in the context of the contribution to the entire logistics chain.

The impact of the manner in which the interaction occurs can be seen in the comparison between cargo assembly and even railings environments. In an even railings environment the availability of the stockpile at the port enables the operation of the railway to be largely (but not entirely) separated from the operation of the port. This in turn allows the railway (particularly the above rail provider) the latitude to operate so as to optimise the utilisation of its rollingstock. In contrast, in a cargo assembly environment there is no such separation – the railway must be completely responsive to the needs of the port. This in turn reduces the flexibility available to the above-rail provider.

In a sense in a cargo assembly environment, rollingstock becomes a substitute for stockpile capacity at the port terminal. That is the railway and port are simultaneously complementary to one another (as sequential links in a supply chain) but also substitutable (at the margin) for one another.

Current evidence of this failure in the coal supply chains

This is clearly an issue in the coal supply chain given the extent of the interdependencies between the participants. One of the consequences of this at the current time is the 'blame game' that arises whenever there is a performance failure in the supply chain. This is symptomatic of a number of things, including a lack of information about (and in turn accountability for) each party's contribution towards supply chain outcomes, issues in attributing the cause of a failure given the interdependency between each link in the chain, and information gaps.

C.4 Incomplete Contracts

Overview of the issues

The optimal operation of the supply chain will vary from time to time depending upon the then bottleneck that presents. This in turn creates a challenge for the contracting framework. The operating paradigm itself will need to adjust for the circumstances that present in order for optimal performance to be achieved. For example, the change in operating mode in the Goonyella coal chain has required rail haulage capacity to be sacrificed in order to achieve supply chain efficiency – however, this change was never contemplated in the underlying contractual instruments.

Disparate supply chains create several problems in this respect. There are gaps in the contractual framework between members of the supply chain. For example, whilst there may be a relationship between each customer and a rail haulage provider and a port, there is generally no contractual relationship between the rail haulage provider and the port. Consequently, crucial interfaces in the transportation and logistics task may be 'incomplete' given individual interactions are not governed by any legal obligations or voluntary codes of conduct.

Without some form of obligation there is no assurance affected parties will be aware of short-term or long-term haulage loads, methods for prioritisation of the transportation task, pricing, capacity or dispute resolution. Due to the incomplete nature of these interactions, participant risk profiles will be adversely impacted and it will also reduce a participant's ability to identify and address all operational issues.

Further, even if there were contractual relations throughout the supply chain, contracting parties are unable to foresee and effectively mitigate all potential market outcomes (sometimes known as due to bounded rationality). Consequently, contracts cannot comprehend or address all of the contingencies that are likely to arise over the life of the contract.

Given these limitations contract inclusions aiming to mitigate risk may not be effective. For example, if performance incentives do not work as intended under all contingencies they may create ex post rent extraction opportunities and bargaining incentives. Similarly, the terms of the contract may be difficult to adapt to significant changes in economic circumstances which may result in further rent extraction opportunities and performance inefficiencies.

Current evidence of this failure in the coal supply chains

The coal producer is the focal point in the supply chain and holds a number of separate contracts with the supply chain participants. However, the terms of these contracts are not necessarily aligned (for example, in terms of take or pay provisions or underlying

capacity assumptions). As noted in chapter 4, a key gap is the absence of a contractual relationship between below-rail and the port.

C.5 Complements and substitutes

Overview of the issues

Normally, the separate elements of a supply chain are complementary – a port requires a railway to deliver coal for ultimate export. In this sense, the rail and port services are complementary.

However, due to the characteristics of the coal logistics chain, some participants can act as substitutes for other chain participants. For example, as previously highlighted, the challenges presented by limited stockpile capacity at ports means that in some cases rollingstock utilisation has changed to minimise the impact on total throughput from the port constraint. In this example, rollingstock capacity is used as a substitute for port stockpile capacity.

Consequently, as the operating basis of a logistics chain changes, so will the nature of the interactions between the elements of the chain, so that the nature of the contribution of any particular element to the overall logistics chain performance can also change.

Current evidence of this failure in the coal supply chains

Under a cargo assembly operating mode, above-rail capacity has had to substitute for port capacity. This is not necessarily a failure in itself – the key source of failure is that this almost happened by accident rather than design. This is not managed from a whole of supply chain view, and is not consistently reflected in planning and contracting arrangements. Also, to the extent that this implies the maintenance of some ‘surplus’ capacity in above-rail to maximise flexibility, issues will arise in relation to ensuring that the above-rail operator can generate an adequate return on, and return of, its invested capital.

C.6 Hold-up concerns

Overview of the issues

A key expansion risk arises from all of the participants of a supply chain that the owner of one link in the chain will delay the expansion of an element of the chain thereby reducing the capacity of the system and potentially stranding investments

parties make elsewhere in the chain. The timing, nature and planning of expansions is critical, particularly in the current environment given the rate of growth in demand. This issue is closely related to information and coordination, with the ability to determine the most appropriate sequence of expansions – at the right time and in the right parts of the supply chain – necessitating a holistic view of supply chain planning.

A problem that can arise is that the supply chain participants (including the mines) can become the hostage to an infrastructure owner that frustrates and delays the expansion plans. The extent to which this risk arises can also vary depending on the degree of counterveiling power that can be exercised by users.

Current evidence of this failure in the coal supply chains

As noted above, a lack of necessary supply chain capacity is arguably at the heart of the current problems. There are a number of reasons that are posited for this, one being that the extent and speed of the boom was simply not foreseen. At least historically, there is no evidence that infrastructure providers deliberately held-up investment due to market power.

Where hold-up has occurred, it is more likely to be due to concerns regarding the stranding risk and/or the rate of return, particularly for regulated providers. Issues surrounding the rate of return are particularly contentious, as what one party may construe as a reasonable commercial rate of return may be viewed as an ambit claim (or an attempt to extract monopoly rents) by another. Stranding risk is a key issue facing any infrastructure provider expanding in response to boom conditions (which may be exacerbated by the pressures on construction costs), given their investment horizon is significantly longer than the horizon of the current forecasts. It can therefore be expected that more infrastructure providers will seek to underwrite investments with long-term take or pay contracts (noting that they are only as strong as the credit worthiness of the user) and/or recover the capital over a shorter period.

The other key failure that has previously been mentioned is the lack of coordination in relation to investment planning.