Exploration of Some Factors Contributing to Under-Provision of Infrastructure Capacity: Coal Railway Networks in Queensland and the Hunter Valley of New South Wales

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Abstract

There is concern by some stakeholders that Australia’s National Competition Policy (NCP) provides insufficient incentive for investment in export supply chain infrastructure. The main focus of this paper is rail infrastructure carrying export coal in Queensland and the New South Wales Hunter Valley. The paper examines the evidence for ‘bottlenecks’ in these supply chains, concluding that under-provision of capacity in the Hunter Valley is likely to persist into the next decade in spite of substantial investment planned by infrastructure owners.

Two major factors that appear to be adversely impacting investment are identified. The first is that insufficient weight is given by regulatory regimes to providing investment incentives, while excessive weight is given to preventing capture of monopoly rents. The paper suggests addition of an appropriate objects provision in Part IIA of the Trade Practices Act. The second factor inhibiting investment is fragmentation of export supply chains, which is preventing coordinated decision making about future capacity requirements and therefore investment. Emerging systems of supply chain collaboration are diminishing the ill effects of fragmentation, but to date have been ineffectual in agreeing on the required scope and cost of investments, creating uncertainty for investors about the future regulatory asset base. The paper suggests adoption of the process recently mandated by the Queensland Competition Authority to determine increments to the regulatory asset base. It also suggests ACCC authorisations to permit vertical and horizontal information sharing to agree forecasts of future demand, and from this the scope and cost of required new capacity.

Introduction

This paper examines major coal railway systems in Queensland and the Hunter Valley (New South Wales) in order to identify factors contributing materially to lags between growth in demand for export coal and necessary investment in additional railway infrastructure capacity. Following recent rapid growth in overseas demand for Australian mineral resources and resulting congestion in a number of export commodity supply chains, questions about the

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effects of regulation on investment in supporting infrastructure have attracted the interest of policy makers, infrastructure users and service providers. In March 2005 the Prime Minister appointed an *Exports and Infrastructure Taskforce* “to identify any bottlenecks, of a physical or regulatory kind … that may impede the full realisation of Australia’s export opportunities”. The Taskforce reported its findings and recommendations on 20 May 2005 (Australian Government 2005, p.7). The Minister for Transport and Regional Services has also asked the House of Representatives Standing Committee on Transport and Regional Services to inquire into the integration of regional rail and road freight transport and their interface with ports (this inquiry has not yet reported). Most industry participants appear to agree that among the factors causing slow responses to emerging bottlenecks are the nature and application of regimes for third party access to rail infrastructure (Australian Government 2005; Australian Council for Infrastructure Development [AusCID] 2005) and the fragmented ownership of supply-chain assets (AusCID 2005, p.11; Pacific National 2005, p.5; RBA 2005, p.50).

Concerns about the impact of competition on investment in infrastructure are not new. In 2002 the Australian Competition and Consumer Commission (ACCC) in its decision to approve the Undertaking proposed by the Australian Rail Track Corporation (ARTC) commented, “[the] ARTC’s returns appear to be well below the full economic cost of providing services. In the longer-term this may undermine investment incentives and compromise the sustainability of the Network.” (ACCC 2002, p.xvii). Productivity Commission member Helen Owens (2003, p.31) also acknowledged that:

> While vertical separation may assist in promoting competition and reducing monopoly rents, it may result in ... major coordination problems and significant safety concerns .... In particular, the implementation of strong access regulation to promote competition may diminish incentives for business to invest in maintaining and upgrading the rail infrastructure.

This paper begins with a description of the export coal supply chains in Queensland and the Hunter Valley, and the management and regulatory systems affecting them. It then examines the evidence for systemic under-capacity in these systems, with major emphasis on the Hunter Valley (for which evidence is more readily available), and discusses factors identified by supply chain participants as contributing to under-provision of transport infrastructure, and concludes by describing and assessing possible remedial actions.

**The Coal Supply Chains**

Australia’s coal exports are transported to specialised ports using regional rail infrastructure, which (on some sections of these rail systems) is shared with other users (freight and passengers). In the year to 30 June 2004 Queensland and the Hunter Valley exported 213 million tonnes (Mt) of thermal and coking coal. These supply chains connected some 70 mines to export terminals, by means of two ‘above-rail’ train operators¹ and approximately 2,000 km of railway track in six largely separate rail networks. The export coal supply chains in Queensland and the Hunter Valley differ in a number of ways, including the size of rail networks, the extent and complexity of network sharing with other users, ownership and control of ‘above rail’, ‘below rail’ and port terminal assets and operations, and the regulatory regimes governing user access to infrastructure services.
Queensland

In the year to 30 June 2005, 156.2 Mt of coal were exported from Queensland’s five major coal-mining regions. In the five years to 30 June 2004, Queensland’s coal exports grew by an average of 7% annually (Queensland Transport 2004). The public railway system in Queensland comprises 9,500 route-km of 1.067-metre ‘narrow gauge’ track. Approximately 1,520 route-km comprising five rail network systems in central and south-west Queensland are dedicated to transporting export coal to seven port terminals. On only two portions of track (in the Brisbane metro area and on the coastal mainline between Rockhampton and Gladstone) do coal trains share infrastructure with other freight and passenger trains. QR is a government-owned business enterprise of the State of Queensland. It is a vertically integrated single corporation, but is required by Queensland’s rail access regime (Queensland Government, 1997) to ring-fence the management of infrastructure assets and operations from its train operations. The rail access regime also mandates access to QR’s track by third party train operators, although at this time there are no other above-rail operators carrying coal in Queensland. There are seven terminals in four ports dedicated to handling coal for export, all of which also subject to a third party competitive access regime. All but one are government-owned. Uniquely, the Dalrymple Bay Coal Terminal (DBCT) is privately owned. The Queensland Competition Authority administers access regimes for rail and ports.

The Hunter Valley of New South Wales

In the year to 30 June 2004, 78 Mt of coal mined in the Hunter Valley were exported through the port of Newcastle – about half the tonnage exported by Queensland. In the five years to 30 June 2004, Newcastle’s coal exports grew by an average of approximately 4% annually (Port Waratah Coal Services 2004). The Hunter Valley coal supply chain comprises 30 coal mines owned by 17 producers using 23 load points. The rail system comprises 433 route-km of railway, serviced by two above-rail train operators (Pacific National Pty Ltd and QR National, a division of QR), moving coal to two major terminals in Newcastle, the world’s largest coal exporting port. Newcastle’s Kooragang and Carrington coal terminals are operated by Port Waratah Coal Services Limited (PWCS), a private company owned by the Hunter Valley coal mining companies. The rail infrastructure is shared with a number of other significant and conflicting freight and passenger services: export grain also shipped from Newcastle, intermodal freight and urban passenger services. Because passenger services have legislated priority over freight, these conflicts have frequent and severe consequences for the reliable movement of coal. The rail infrastructure is leased by the New South Wales government to the Australian Rail Track Corporation Limited (ARTC) (wholly owned by the Australian Federal Government). Conflicting trains sharing portions of the infrastructure are operated for grain and general freight by Pacific National, QR National and privately-owned Australian Railroad Group, and for urban and regional passenger services by publicly-owned RailCorp.

The ownership and control of rail infrastructure was vertically separated from train operations a decade ago, with establishment of the NSW rail access regime. Competitive access to the Hunter Valley network is mandated by this rail access regime, which is administered by the state-based Independent Pricing and Regulatory Tribunal (IPART). The entity formerly controlling the rail infrastructure, the Rail Infrastructure Corporation (RIC), obtained approval from IPART for an access undertaking, which has been transferred to ARTC. The ARTC has agreed to lodge a new access undertaking with the Australian Competition and Consumer Commission (ACCC) as soon as practicable.
Supply Chain ‘Bottlenecks’

It is appropriate to ask, before examining factors that might account for ‘bottlenecks’, what evidence is there in relation to their existence, of the extent of failure to anticipate congestion or to plan for and provide new capacity.

The fact that all or part of both supply chains are rationing capacity to minimise ship queuing and resulting demurrage costs indicates that current capacity is insufficient to meet demand. The ACCC authorised a Capacity Distribution System (CDS) to operate in Newcastle in 2004, and authorisation for an improved Capacity Balancing System was granted in March 2005 to operate to the end of 2007. The ACCC has also granted interim authorisation for a similar system to be operated by the Dalrymple Bay Coal Terminal. The short-term savings in demurrage costs are calculated by the ACCC to be up to $750 million annually. However, such schemes are not a substitute for investment in new capacity. An Australian Government study has calculated that loss of export revenue and GDP consequent on rationing greatly exceeds the cost of investment in new capacity (Australian Government (n.d. [2005], p.11). The ACCC has also pointed out that rationing schemes tend to generate significant economic costs by giving incidental advantage to higher cost mines and by unplanned under-utilisation of existing capacity.

While supporting the authorisation of a capacity rationing system at Newcastle, Xstrata Coal, commented in 2004 (ACCC 2004, p.52), that:

We believe … customer concerns have resulted in the Hunter Valley losing sales to Queensland coal producers and also, at times to producers in China. Put simply, coal buyers prefer to deal with producers who can provide certainty in relation to shipments and delivery timing and who are not at the mercy of shipping delays outside their control.

Analysis by the Reserve Bank of Australia (2005, p.49-50) has suggested that the rail infrastructure in both Queensland and the Hunter Valley has been a significant bottleneck:

In the case of Newcastle, exports are running below port capacity and bottlenecks appear to be concentrated in the rail network. For the two major Queensland supply chains, the ports are operating close to capacity and investment in both port and rail facilities is necessary to allow export growth.... Growth in rail capacity is expected to be broadly in line with the expansion of port capacity. However, this is unlikely to match the expansion in production potential or export demand, so transport capacity is likely to remain a constraint on export supply, at least until a number of proposed large infrastructure projects are completed later in the decade.

History suggests that in New South Wales the problem of under-provision of capacity has been endemic for at least a decade. In 1998 the ACCC granted temporary authorisation to Newcastle’s PWCS for a capacity allocation system, anticipating solutions to the problem in the short-to-medium term. In 1996, the Rail Infrastructure Corporation (RIC) had developed a ten-year $194 million capital works program for the period from 1996 to 2006. However, late in this planning period, it was found that “the condition of the infrastructure had deteriorated since 1996” (Office of the Coordinator General of Rail 2003, p.8). Then in June 2005, near the end of the planning period, a report by an Australian Government Senior Officials Group (SOG) (Australian Government (n.d.) expressed more detailed concerns
about under-provision of rail infrastructure and train carrying capacity in the Hunter Valley, and also through the Dalrymple Bay Coal Terminal. The SOG recommended more effective supply chain cooperation and urgent action to bring forward investments, especially in new port terminal infrastructure.

PWCS states that system capacity reached 78 Mtpa in late 2003 (actual throughput was 77.8 Mt in 2003/04) and 80 Mtpa by the end of 2004 (ACCC 2004, pp 45-9). However, industry forecasts indicate demand for movement of 102 Mtpa of coal in 2006, with projections of up to 140 Mtpa by 2009 (Australian Rail Track Corporation 2005b, p.4). As part of the lease agreement package, the ARTC agreed to invest $152 million to upgrade the Hunter Valley network, to take its capacity to over 100 Mtpa. In May 2005 this planned investment was almost doubled to $270 million, to increase the rail capacity from 85 Mtpa to 140 Mtpa by 2009 (ARTC 2005a). According to the ARTC, its strategy is “to address existing capacity bottlenecks in the short-term and to then ensure that … capacity is delivered ahead of likely demand.” (ARTC 2005b)

Before completing its Hunter Valley lease agreement, the ARTC’s ‘Hunter Valley Coal Capacity Enhancement Project’ quantified the capacity of every section of track in the network; in particular it examined junction conflicts and minimum train headways (which determine the number of trains per time period), to identify sections of track where longer headways were required, thus reducing capacity. This process included capacity deductions to account for non-coal trains on the line and maintenance access to the track. This process identified a number of specific track sections requiring investment to match capacity with projected demand. The plan evolved from this detailed study aims to complete works at five locations between December 2005 and March 2008 that should expand capacity in line with growth in demand (ARTC 2005b, p.34). Planned expansion in rail capacity to 102 Mtpa in July 2006 is in line with planned capacity expansion at PWCS’s coal loading terminals. However, plans by PWCS for further increases in capacity after 2006 are less certain in their timing. A third coal loading terminal is required at Newcastle to take capacity to 120 Mtpa and beyond, and current planning indicates completion will not occur until at least 2012, with demand and railway capacity expected to exceed this level by 2008.

While under-capacity remains an on-going problem in the Hunter Valley, there is also evidence that service providers have been increasing system capacity in response to demand. The parties involved in the Hunter coal chain have formed the ‘Hunter Valley Coal Chain Logistics Team’ (HVCCLT), which is developing and implementing new systems for centralised delivery planning, scheduling, demand planning; the arrangement is also implementing improvements to existing operating practices and planning new investments (Pitt and Everingham 2005). If the current plans and planning and management systems of the ARTC, PWCS and HVCCLT can be carried to completion, congestion problems could abate in the next decade.

Some key stakeholders appear optimistic that current plans will serve their interests. For example the New South Wales Minerals Council (New South Wales Minerals Council 2005):

Ownership and management structure of the Newcastle coal loading terminal has worked well…. Since the Australian Rail Track Corporation … has taken responsibility for the Hunter rail network, some progress has been made and the NSWMC is hopeful that construction will soon start on removing the worst of these bottlenecks. Planning is proceeding with work to progressively ease other bottlenecks as demand increases.
Indications are that ARTC will do better than Rail Infrastructure Corporation, the NSW government-owned former manager of the Hunter rail network, in building required capital works.

Xstrata Coal and other Hunter coal chain participants Pacific National and Rio Tinto also appear optimistic that improved planning and management by the HVCCLT will “improve transport outcomes” (Xstrata 2005).

In Queensland, there is clearly frustration at the inability of export coal supply chain service providers to keep up with growing demand. The queuing at the Dalrymple Bay Coal Terminal is well known. In spite of substantial planned investment in new infrastructure and rollingstock by QR, Xstrata Coal (2005) states that for coal exported via Gladstone:

*The rail capacity on the Blackwater system is the constraint. Despite the arrival of a 19th consist in February [2005], [year to date] railings into Gladstone are only running at a 38 million tonne annualised rate and below contracted rates.*

In conclusion, the balance of evidence, much of which cannot be presented here, shows that the Hunter Valley coal chain has a history of serious capacity problems, and that these are likely to continue at least to the end of this decade. For Queensland the available evidence is less detailed, except for the Dalrymple Bay Coal Terminal, where recent queuing has imposed significant costs on coal supply chain users.

**Factors Contributing to Under-Provision of Capacity**

A number of potential impediments to investment are suggested in recent commentary by a variety of stakeholders in the Queensland and Hunter Valley export coal supply chains. This paper focuses on two factors that have been strongly highlighted by stakeholders:

- **Multiple or conflicting objectives for Regulation:** A number of stakeholders have contended that insufficient weight is given by regulatory regimes to providing investment incentives, and that excessive weight is given to prevention of rent capture by infrastructure owners (and to price-capping mechanisms intended to achieve this outcome. The protracted processes involved in prescriptive price cap regulation have also been blamed by some stakeholders for delaying if not discouraging investment. A case study offered in this paper as part of the discussion of this issue, and tends to show that while this issue may require changes to regulatory regimes, effective processes for pragmatic conflict resolution have been evolved by at least one regulator. However, an unresolved issue of conflict remains – relating to the regulatory asset base – and the method for of resolving this issue proposed by the QCA appears to provide a model for other jurisdictions to adopt.

- **Supply chain fragmentation:** Many stakeholders have contended that supply chain fragmentation, including vertical separation of rail, has inhibited coordinated decision-making about investment in new capacity. Emerging systems of supply chain collaboration mentioned above are diminishing the ill effects of fragmentation, but the evidence is inconclusive that these will address all relevant issues, including those relating to the regulatory asset base.

Some stakeholders (e.g. NSW Minerals Council n.d.) have strongly contended that public ownership and resulting conflict between the public sector’s roles as owner and regulator...
have been adverse to investment in new capacity. The evidence for this is unclear, and in any case, privatisations and transfer of control of key assets between public sector jurisdictions has made argument about this factor affecting investment less important than in the past. For this reason, this issue is not discussed in this paper.

**Conflicting Objectives of Regulation**

The Prime Minister’s Exports and Infrastructure Taskforce has clearly articulated this issue (Australian Government 2005, p.40):

> While regulation in Australia operates under a wide range of differing regimes, a common feature of these regimes is that they require regulators to pursue multiple, somewhat conflicting objectives.

This section of the paper shows that ‘multiple somewhat conflicting’ objectives are clearly present in the regulatory systems affecting the export coal supply chain. The price capping mechanisms in the regimes are regarded by infrastructure owners as a potential deterrent to investment. The perception of potential disadvantage by both ‘sides’ in negotiation of regulatory outcomes may be causing process delays. The Exports and Infrastructure Taskforce (p.42) comes out on the side of the infrastructure owners in its view of the desirable objectives of regulation. It goes on to suggest that regulators should “focus their task on assessing whether what has been proposed as the regulated terms and conditions of access is a reasonable commercial outcome”. The Case Study presented below suggests that processes do exist for pragmatic resolution of the ‘conflicts’ of objectives.

Consumers of infrastructure services (e.g. mining companies and train operators) seek to minimise monopoly rents taken by infrastructure owners (of rail track and port terminals); this requires regulators to cap maximum rates of return and strictly scrutinise and determine asset valuations. On the other hand, incentives to invest in infrastructure require the opposite: rates of return adequate to attract inflow of capital, and full recognition of fixed asset values augmented by investment in new rail and port capacity. The tensions between these contending outcomes from regulation are apparent in the frustration evidenced by infrastructure users that the owners are reluctant to invest in the face of ‘clear need’; and by the view of owners that the rewards for new investment must be adequate to attract new capital and take full account of risks.

Neither third party access regimes nor access undertakings require infrastructure owners to invest where there is congestion or other symptoms of under-capacity. The ARTC’s 2002 Access Undertaking (clause 6.2), approved by the ACCC, provides that the ARTC will approve additions to capacity if in its opinion, the addition to capacity is “commercially viable”, or if the access user agrees to meet the cost. The QR Access Undertaking has similar provisions (clause 7.4.1 (e)). However, even if investments are likely to be viable, there can be disagreement about additional charges to cover the costs arising, especially where they might exceed price caps, or the distribution of benefits and costs among competing users.

Users clearly expect that in return for their access charges, they will be provided with adequate capacity to avoid congestion. This view is reflected in comments by Hunter Valley coal train operator Pacific National (2005, p.5):
Even where full economic costs can be recovered (as in the Hunter Valley coal industry), we have still seen refusals to invest or delays in timeframes, due to misalignment of objectives.

Similar frustrations are evident in comments from coal companies, for example major coal miner Xstrata (2005):

Disciplined operation and investment is required to ensure that once capacity is required, the infrastructure providers invest at the appropriate rate of return and proceed to deliver the capacity. The major areas of current uncertainty are Prime’s plans at Dalrymple Bay and ARTC’s plans for the Hunter Valley. Both bodies have in the past indicated that they will not invest unless the regulated rates of return are sufficiently high.

And, also from Xstrata (2005):

... current regulatory arrangements are unwieldy, slow and still expose the coal industry to being ‘held to ransom’ on expansion. Direct negotiation with monopolies will lead to actual or potential monopoly rent extraction and consequent inefficiencies....

Significantly, at least one key stakeholder, the NSW Minerals Council, representing mineral producers in the state, appears to believe that monopoly rents are no longer an issue (NSW Minerals Council, n.d.):

When [the National Competition Policy] was introduced ... most coal exporters using the Hunter rail network paid a significant monopoly rent .... Now monopoly rent has been virtually eliminated and above-rail operations are more efficient than before.

In contrast, infrastructure owners are clearly unsatisfied with the objectives currently being sought by access regimes, which in their view provide a framework in which there are insufficient incentives to invest. According to the ARTC (2005c):

... one of the key impediments to further improving the efficiency, capacity and sustainability in coal supply chains is the impact of regulation .... Previous and current regulatory practice in [the Dalrymple Bay Coal Terminal supply chain] appears to have focus [sic] on achieving efficiency gains and improving chain competitiveness in the short term, rather than on sustainability and growth of the chain in the longer term.

The owners of the Dalrymple Bay Coal Terminal are also explicit in their view of regulatory outcomes. Referring to a draft determination of a price cap mechanism by the Queensland Competition Authority (Dalrymple Bay Coal Terminal Pty Ltd, 2005, p.18):

The level of the proposed price cap is currently being disputed as [the terminal owner] argues that the price cap renders further investment in port expansion at the Terminal uneconomic.

This general view of infrastructure providers is supported and articulated by the Australian Council for Infrastructure Development (AusCID 2005):
Regulatory policy needs to focus more on long-term economic efficiency, with a better balance between current prices and future investment .... It is AusCID’s long held view that regulators have been primarily motivated by removing rents from regulated firms and to a lesser extent looking after the (short run) interests of users and consumers .... The outcome of this approach is ultimately to present infrastructure operators with a set of prices well below what is needed to cover their long run costs. In the short run, given that such a large proportion of costs are sunk, there is little damage done but in the long run, investment is not forthcoming leading to socially sub-optimal levels of supply.... The focus of regulatory policy must be long run economic efficiency in the allocative, productive and dynamic efficiency sense. Distribution should not generally be the focus of regulatory policy and in particular, holding down prices for their own sake should not be an objective of regulatory policy.

The ARTC has further articulated its view that:

...there are a number of elements of the existing rail access regime in NSW that have the potential to constrain growth and sustainability [of] investment, to promote efficiency and reduced pricing.

 Examples of these include: The stand-alone nature of the revenue ceiling test.... [the fact that] The regulatory regime only provides for a return on the regulatory asset base associated with a defined network deemed to be required for regulated coal use.... [and] The regulatory rate of return allowed by the regulator ... may not recover the company’s WACC, let alone achieve the company’s hurdle rate, which may be set higher. Regulation does not provide for any further upside to act [as] an incentive to invest.

The Prime Minister’s Exports and Infrastructure Taskforce has taken a view closer to that of the infrastructure owners (Australian Government 2005, p.42):

... regulators should, as their primary duty, be required to ensure that efficient investment in Australia’s infrastructure occurs, and occurs in a manner consistent with the continued reliable and secure provision to the community of the services that infrastructure provides.

The evidence of outcomes provided in previous sections of this paper is that on balance the ‘investment’ objective has not been achieved; some evidence presented by infrastructure owners, described only briefly here, is that some mechanisms in the current regulation do tend to inhibit investment. There is also a little evidence that infrastructure users are more satisfied than in the past that monopoly rents are being controlled.

In conclusion, the available evidence suggests a need for regulatory legislation and practice to achieve a different balance between the contending regulatory objectives, tipped more towards providing incentives for investment.* An initiative to address this issue suggested by the Exports and Infrastructure Taskforce is insertion of an objects clause into Part IIIA of the Act, to emphasise the primacy of fostering efficient investment in new essential infrastructure. Rather than enshrining incentives for investment as the sole objective of Part IIIA, the goal of

* This is a hypothesis of research being undertaken currently by Mr Nick Wills-Johnson, Research Fellow in the Planning and Transport Research Centre (n.wills-johnson@curtin.edu.au). The hypothesis will be tested using, *inter alia*, quantitative analysis and game theory.
balance would be better achieved in the long term by specifying both investment incentivisation and avoidance of rent capture. There is apparently a need to resolve issues largely unique to New South Wales, concerning the stand-alone ceiling test, etc.

While suggesting that changes be made to give explicit emphasis to the ‘investment focussed’ objectives of access regulation, there is evidence that pragmatic processes conducted by regulators can resolve the ‘conflicts’ inherent in multiple objectives. The Case Study provided below seeks to illustrate the ability of regulatory processes achieve balance by pragmatic conflict resolution between the contending parties.

**Balancing Objectives – Case Study**

It is instructive to explore how in practice the processes adopted in New South Wales and Queensland have attempted to reconcile the multiple objectives of access regulation. In the regulatory process, the issues for stakeholders and regulators are the rate of return on investment (WACC), the rate of depreciation (determined by estimates of ‘remaining mine life’), and the value of rail infrastructure assets (the ‘regulatory asset base’) including requirements to meet forecast demand. For this paper we have briefly examined the experience in resolving these matters in the Hunter Valley and for the Dalrymple Bay Coal Terminal in Queensland. In the Hunter Valley, the processes followed for establishing a broadly acceptable rate of return were relatively simple, transparent and ultimately successful … the outcome of a complex but pragmatic process of transparent analysis and reasoned compromise. In Queensland, the process was notoriously slow, though ultimately also successful.

The Independent Pricing and Regulatory Tribunal of New South Wales (IPART) had determined a rate of return and remaining mine life in 1999, and in 2000 determined a DORC valuation of the regulatory asset base of the Hunter Valley coal network. In 1999 IPART determined a pre-tax real return of 7.5%. These were times of slower growth in demand for coal, although capacity appears then to have been under-provided in the Hunter. In accordance with its legislation, IPART was required to review these matters again in 2004. In submissions to this review the ARTC made clear its intention to invest only if the rate of return was sufficient to attract the necessary finance. Both beta and WACC values proposed in the 2004 review were widely divergent in written submissions, from the New South Wales Minerals Council, rail carrier Pacific National and infrastructure lessee ARTC. However, at a face-to-face workshop convened by the IPART Chairman and attended by the chief executives of all key stakeholders, it was readily agreed that an appropriate rate of return was in the range 7.1% to 7.5% (IPART 2005), and the rate was subsequently determined by IPART at the mid-point, 7.3%. A similar process was followed to reach agreement on ‘remaining mine life’, and hence the rate of depreciation agreed to apply to the asset base.

As is well known, the processes for determination of key regulatory parameters for the Dalrymple Bay Coal Terminal (DBCT) by the Queensland Competition Authority (QCA) have been less harmonious, but ultimately have succeeded in creating the conditions for appropriate investment. The QCA has been at pains to explain why the process has been a lengthy one.
The remarkable outcome of the process conducted by IPART was that by putting the major stakeholders face-to-face in a room to consider the issues, with assistance from the Tribunal, a pragmatic comprise was reached very quickly. Certainly the success of this conference depended in part on detailed prior analysis of issues, in order to arrive at a reasonable range. As experience with these technical issues accumulates, arriving at the appropriate range should occur more simply and quickly; in New South Wales this is required to occur only every five years.

In conclusion, it is suggested that greater use be made of conference procedures, as used by IPART, to bring stakeholders together for resolution of key issues relating to rates of return and remaining mine life; this process should also be used to resolve issues relating to forecasts of future demand. These conference procedures should be underpinned by a broader and stronger collaboration among supply chain participants. The need for and experience with this supply chain collaboration is the subject of the final section of this report.

An Outstanding Issue – The QCA solution: The agreements reached by IPART-conducted processes detailed in the Case Study contribute materially to facilitating required investments in the Hunter Valley. The ARTC has published an investment program to provide rail infrastructure capacity up to 140 Mt by 2009. However, it is understood that export coal supply chain stakeholders have yet to agree a future forecast of coal haulage capacity requirements. This in turn means there can be no agreement on the asset base to which the agreed rate of return should apply. This outstanding issue will impede decisions by ARTC about investment in new infrastructure capacity beyond what is required to meet the agreed 2006 forecast of 102 Mt.

It is significant that this issue has been addressed by the QCA and resolved for the DBCT in Queensland. The QCA decision in relation to this matter should be considered by others attempting to resolve this issue. Quoting at length from the QCA decision (QCA 2005, p ii):

... the Authority is prepared to automatically approve expansion proposals where:

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

Expansion proposals that do not meet these criteria will be considered by the Authority on their merits. However, the Authority ... will approve any prudent expansion proposals.

To streamline the assessment of whether expansion costs are efficient, the Authority has included the option of a tender approval process along the lines of that included in the Gas Code. This option provides for the Authority to approve the process for conducting the tender and selecting tenderers for the capital works.

Provided the approved tender processes are followed, the resulting actual capital expenditure will be automatically included into the regulated asset base [emphasis added].

Given the general concern about the current rail in-loading capacity, the Authority has determined to include in the regulated asset base the efficient cost of the works needed to increase rail in-loading capacity, if such works are submitted to the Authority.
Once a capital expansion is approved by the Authority, the proposed revenue cap will protect [the DBCT owner] from income fluctuations over the short to medium term. At the same time, provision has been made for [the DBCT owner] to retain a portion of any increased revenue it has been responsible for, in order to encourage it to consider coal chain improvement.

In the longer term, the Authority undertakes that it will not write-down the value of the terminal in the future, except in exceptional and specified circumstances e.g. where the Authority has approved a terminal expansion based on false or misleading information provided by [the DBCT owner].

The process adopted by the QCA appears to be reasonable and pragmatic and to recognise the need to encourage on-going investment. Its main advantage appears to be process simplicity and avoidance of further consultant-driven research and ‘paralysis by analysis’. Through participation in the process tender approval, there is an opportunity for users to contest the scope and cost of expansion works required to achieve capacity needs. This approach would be in the spirit of traditional rate of return regulation in the U.S., in which any assets purchased that cannot be shown to have been imprudent receive a fair rate of return. 14

**Fragmented Supply Chains**

So far this paper has focussed on issues arising from the multiple and some say conflicting objectives of access regulation, and processes for reconciling these to arrive at outcomes acceptable to all supply chain participants. The second major issue mentioned by many stakeholders is supply chain fragmentation, which causes lack of coordination in decision-making about infrastructure investment. Lack of information flow among stakeholders aggravates the forecasting and investment risks referred to above. The contending stakeholders in regulatory processes are in fact partners in their respective export coal supply chains. The opportunity exists for them to collaborate to address many of the issues raised in this paper, provided processes exist in which this can occur. Such processes have been established in the Hunter Valley and in Queensland, but the scope of collaboration is limited.

The multiple ownership and control of components of the export coal supply chains have been described in this paper. Pittman (2005) makes a cogent case for the economic advantages of vertical integration of railways, and conversely the costs of vertical separation. The mixed experience in Australia in this regard is summarised by the Australian Council for Infrastructure Development (AusCID 2005, p. 11):

> It seems highly desirable that the major trunk network, where above rail competition is possible, be vertically separated. However, the case is much less clear in those situations where the railway is built by a firm for its own private use (such as in the Pilbara) or where the railway has relatively few users and serves quite specific markets....

Xstrata Coal (2005) states:

> Cooperative coal chain planning is necessary for large integrated coal haulage systems to arrive at a common view of capacity and efficient operation.... PWCS has been able to play an effective role in working with other Hunter logistics providers to deliver improvement ... these coal chains require strong leadership from port operations to be effective.
Some degree of horizontal and vertical separation in the Hunter Valley and Queensland supply chains is unavoidable, as there are multiple coal mines and transport service providers owned by separate entities. This contrasts with the ‘ideal’ situation of Western Australia’s Pilbara region iron ore supply chain, where mines, rail and port infrastructure are under single ownership. Generally in the Hunter Valley and in Queensland there are binding contracts only between ‘adjacent’ service users and providers (miners/train operators, train operators/track managers, miners/port operators). Without coordination between these multiple contracting layers, in an environment of business growth and capacity constraint, the impacts of fragmentation are likely to be seriously negative.

The costs of fragmentation are evidenced most obviously in ship queuing, but closer to the ground fragmented management causes mismatches of daily capacity planning in the rail and port systems, lack of medium-term planning for maintenance ‘possessions’ of infrastructure and capacity build-ups for foreseeable demand peaks, and in the longer-term mismatched demand forecasting and disconnected planning for capacity expansion. The effects of absence of operational coordination is significant loss of capacity, visible in daily bottlenecks at port terminals and failure to deliver planned tonnages to stockpiles; these failures can be aggravated by uncoordinated maintenance outages – a major issue in the past in the Hunter Valley. Absence of systems for coordinating planning has in the past contributed to inward-looking, overly complex and confused capacity planning in the rail infrastructure provider. This has been aggravated by separation of above-rail train service planning and provision from below-rail management of infrastructure maintenance and capital works planning and project management. In the better coordinated QR system, above/below rail coordination has been possible in spite of ring fencing, the effects of which are felt predominantly in commercial relationships.

Remedies for supply chain fragmentation have been emerging for at least a decade, and are beginning to demonstrate their value. All arrangements to date have limited the scope to parts of the chain – coordination between coal miners and the port, or between above and below-rail service providers – or to a limited scope of issues. The oldest of these arrangements is the Port Waratah Coal Services company in which coal miners and the Port of Newcastle collaborate to operate coal-loading terminals. The ARTC (and before it the Rail Infrastructure Corporation) are required by the rail access regime to “establish a consultation process with access seekers [train operators] with the objective to identify, prioritise and evaluate future network investments and refine the capital works programme.” (Rail Infrastructure Corporation 2004, p.3). The track owner is required to explain its planning approach, including the trade-off between maintenance and capital expenditure; identify the proposed capital investment needs for the forthcoming year and for the next four years; explain the inputs to and outcomes of the evaluation undertaken for the proposed capital expenditure; and provide an assessment of the impact of the proposed capital expenditure on the Regulatory Asset Base. These requirements appear very sound and have given rise to the ARTC’s recently published major plan for investment in new capacity in the Hunter Valley, described earlier in this paper. However, as also previously indicated, they are only a partial solution to the complex coordination needs in the Hunter Valley.

Another partial solution is the initiative by a broader group of Hunter Valley stakeholders to coordinate operations and planning by formation of the Hunter Valley Coal Chain Logistics Team (HVCCLT). This has produced a measurable increase in capacity; a number of stakeholders have reported that ‘soft investment’ in operational planning has added some 15%
to system capacity. Recent intensive analysis of capacity constraints and interfaces with conflicting track users (e.g. with Hunter Valley passenger services) and development of computer-based operational planning systems have contributed further increases in capacity. Perhaps more importantly, these initiatives have facilitated a much-improved understanding of the location and scope of investments required to expand the capacity of both rail and port infrastructure. Similar coordination arrangements are at an early stage of development in Queensland, through a Steering Group for the Gladstone Coal Chain Improvement Program (GCCIP), which is seeking opportunities to lift throughput in the short term.

There is clearly scope for further development of these arrangements in both Queensland and New South Wales. The most pressing need is for stronger collaboration between supply chain participants in demand forecasting, which is the basis for future capacity planning. In the Hunter Valley there appears to be consensus among most stakeholders that a greater and more transparent exchange of information is required.

Pacific National has proposed “incentives for cooperative supply chain behaviour”, and establishment of a Surface Transport Regulator to regulate “nationwide significant transport chains”. It has also proposed (Pacific National 2005, p.6) that:

An interim measure … would involve minor amendment to the ACCC’s access undertaking assessment guidelines, to take into account the wider system impacts of an infrastructure service subject to an undertaking …. The regulatory approach to authorising cooperative structures in surface transport [also] requires amendment, to provide increased support for cooperative models that promote supply chain efficiency.

A key impediment to facilitation of collaboration (horizontally and vertically) between supply chain participants in respect of demand forecasting and capacity requirements appears to be section 45 of the *Trade Practices Act 1974*, which prohibits any contract, arrangement or understanding which has the purpose or effect of substantially lessening competition, i.e. potential or actual cartel behaviours. To enable extension of arrangements like the HVCCLT and the GCCIP to facilitate collaboration on demand forecasting and capacity requirements, it would appear necessary to enable non-temporary ACCC authorisations to be given to such arrangements.

Authorisations should be limited to supply chain collaboration between entities selling goods or services in different markets (e.g. between single entities selling export coal and single entities providing rail infrastructure or rail transport; or between rail and port service providers), not between entities in the same upstream or downstream markets. To produce useful outcomes, this would require rail and port infrastructure owners to exchange information on a one-to-one basis with miners, and supplement this with input from other sources to make judgements about future demand and capacity requirements, and collaborate with the collective of all miners only after aggregation of forecasts and plans. To guard against the risk of cartel behaviours evolving from these authorised arrangements, a regulator could supervise them, perhaps through mechanisms in relevant infrastructure undertakings.

**Conclusions**

There is indisputable evidence of endemic under-provision of infrastructure capacity in the Hunter Valley export coal supply chain, and some evidence of under-provision in the Queensland system. The analysis in this paper suggests that the factors most likely to be
remediable include an imbalance in the objectives of regulation, and fragmentation of supply chain ownership and management control.

The major issues emerging from this analysis are the need for a rebalancing of the objectives of regulation, and mechanisms to facilitate a broader scope of collaboration between supply chain partners. This paper suggests that consideration be given to the following changes:

- The addition to Part IIIA of the Trade Practices Act of an authorisation mechanism based on efficiency, aimed at facilitating collaboration between supply chain participants on all matters relevant to effective management of efficiency (short- and long-term).
- Insertion of an objects clause into Part IIIA of the Act, to emphasise the primacy of fostering efficient investment in new essential infrastructure, and
- Greater use of conference procedures, as used by IPART, to bring stakeholders together to resolve key issues relating to rates of return and remaining mine life; this process should also be used to resolve issues relating to forecasts of future demand.
- Adoption of a process similar to that mandated by the QCA for establishing regulatory asset values following major new investments in supply chain infrastructure.

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References


Australian Rail Track Corporation (2005c), Submission to House of Representatives Standing Committee on Transport and Regional Services, Inquiry into Integration of Regional Rail and Road Networks …, (www.aph.gov.au/house/committee/trs/networks/subs/sub068.pdf; accessed 21 June 2005).


New South Wales Minerals Council (2005), “Submission to the House of Representatives Standing Committee on Transport and Regional Services, Inquiry into the Integration of Regional Rail and Road Freight Transport and their Interface with Ports”, 10 June 2005.


Xstrata Coal (2005), Submission from Xstrata Coal to House of Representatives Standing Committee on Transport and Regional Services Inquiry into integration of regional rail and road networks and their interface with ports, May 2005.
Endnotes

1. ‘Above rail’ refers to the moveable ‘rollingstock’ and locomotives; ‘below rail’ refers to the track, signalling and communications fixed infrastructure. Where ownership of ‘above’ and ‘below’ rail assets is vertically separated, the position of loading/unloading terminals is ambiguous; although they are largely ‘below rail’ assets, they are generally owned, controlled and operated by the ‘above’ rail operators.

2. Personal communication: Bob Scheuber, QR Chief Executive Officer, 5 July 2005.


5. ‘QR’ is the currently trading name of Queensland Rail. Operations outside Queensland trade under the name ‘QR National’.

6. QR National has entered into two contracts to haul coal from mines at Duralie (near Gloucester) and Mt Arthur (near Muswellbrook); it is understood carriage of coal will commence in 2005/06.

7. This lease, which commenced in September 2004, displaced the NSW-Government owned Rail Infrastructure Corporation, which had previously managed the Hunter valley system. See www.artc.com.au/docs/nswlease/pdf/Final_Tripartite_Agreement.pdf; accessed 3 July 2005).


9. The Hunter Valley Coal Chain Logistics Team (HVCCLT) was officially launched at the beginning of July 2005, after execution of a Memorandum of Understanding by its members Pacific National, QR National, Port Waratah Coal Services, the Australian Rail Track Corporation, Rail Infrastructure Corporation, RailCorp and the Newcastle Port Corporation (source: “Hunter coal chain launched”, Marian Hookham, in Transport Industry News.net, 6 July 2005.

10. The best source for a comprehensive discussion of demand and capacity issues appears to be the ACCC document authorising the 2004 Capacity Distribution System (ACCC 2004).

11. These issues are discussed at length in the ACCC’s report on the ARTC Undertaking (ACCC 2002).

12. The purposes of the QCA decision in relation to the DBCT were not only to determine ab initio the rate of return, but also to approve a new access undertaking, determine a regulatory asset base, a ceiling price per tonne, and “mechanisms … to enable expansions to occur easily and for the efficient costs of such expansions to be automatically added to the regulated asset base provided certain criteria are met.” (Queensland Competition Authority (2005), p. i) These determinations were carried out in an environment in which the stakeholders had widely divergent views on appropriate outcomes.


14. Personal communication from Russell Pittman, visiting professor, the New Economic School, Moscow, and Director of Economic Research and Director of International Technical Assistance, Economic Analysis Group, Antitrust Division, U.S. Department of Justice.

15. Details of the HVCCLT MOU have not been published, so the scope of matters covered by it is not known.