



Aurizon Network's Commercial and Regulatory Risks

Report for Aurizon Network

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1 Background

Section 168A(a) of the *Queensland Competition Authority Act 1997* (the QCA Act) states that the price of access to a service should:

...generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved...

This reflects the provisions of the *Competition Principles Agreement*.

In assessing Aurizon Network's rate of return, past regulatory decisions have focused solely on the Weighted Average Cost of Capital (WACC). This provides for an expected return on debt that is seen to be based on the prevailing benchmark cost of comparable borrowings in the market and an expected return on equity that is derived via the Capital Asset Pricing Model (CAPM). This in turn only provides compensation for systematic or non-diversifiable risks. From a review of past regulatory decisions, it is also not evident that any explicit consideration has been given to regulatory risk.

Accordingly, in addition to reviewing what the appropriate return on capital should be for Aurizon Network, a more fundamental question is the scope of this review, having regard to its entitlement to compensation for commercial and regulatory risks as specified under the QCA Act. With the historical focus of the return on capital being the CAPM-derived WACC, we contend that this does not satisfy the requirement of allowing a "return on investment commensurate with the regulatory and commercial risks involved", because:

- this does not include compensation for non-systematic risks; and
- there is no evidence that any regard has been given to regulatory risk (which may or may not be systematic).

Section 168A(a) does not limit the return on capital to systematic risks. It also explicitly recognises regulatory risk. It is therefore necessary to consider these risks within the context of the return on capital. To the extent that Aurizon Network is exposed to these risks, the next question is whether it is entitled to reasonable and efficient compensation for bearing the risks (which must also have regard to whether the risks are otherwise compensated), and then how this might be determined.

The balance of this paper will:

- assess Aurizon Network's commercial and regulatory risks;
- examine the issue of regulatory risk and how this risk might be compensated;

- compare Aurizon Network against certain other regulatory regimes; and
- conclude with some recommendations for the treatment of commercial and regulatory risk.

2 Commercial risks

The following section identifies and assesses Aurizon Network's main commercial risks, examining:

- the nature of the risk
- is it systematic or non-systematic
- is it currently compensated.

2.1 Stranding risk

2.1.1 Nature of the risk

Risk of a material and sustained reduction in demand

The main source of stranding risk for Aurizon Network is market or demand risk, that is, a material and sustained reduction in the demand for the service. Under section 1.4(a) of Schedule A of Aurizon Network's 2010 Undertaking, the QCA can reduce the value of the Regulatory Asset Base if:

...circumstances arise in the future where demand has deteriorated to such an extent that regulated prices on an unoptimised asset would result in a further decline in demand...

The demand for Aurizon Network's services is driven by the demand for export coal. A material and sustained reduction in demand could arise for a number of reasons, including:

- a global economic recession;
- a slowdown in economic growth in one or more major importing nations, particularly China;
- a substitution away from coal in steel-making and/or energy production, due to government policy changes (which is particularly a risk for thermal coal) or technology changes;
- a reduction in the competitiveness of the Queensland export coal industry relative to other producing nations (including increases in domestic production from major importing nations such as China).

It is extremely difficult to assign any probabilities to the above events occurring, although any of the above scenarios are possible. More recently, concerns have been

expressed about the ability of Queensland producers to remain competitive given significant increases in costs, particularly for new developments. For example, research by Port Jackson Partners released on 30 May 2012 shows an erosion of competitiveness across the Australia minerals and energy sector and a worrying decline in international market share.¹

According to Port Jackson, for the past five years the resource boom added \$93 billion to Australia's national revenue, with \$44 billion from price increases and \$49 billion from volume growth. However, the size of this revenue is expected to be reduced by sustained price moderation, slowing demand growth and the quantum of the supply-side response. It points to rising labour, energy and transport costs, as well as a high exchange rate, as making Australia a high-cost destination for mining projects². It highlights the need for a coordinated policy response to pressures that deliver advantage to existing and new competitors.

Aurizon Network can currently mitigate this risk on new investments via the application of a rolling 20 year life for depreciation purposes, although this does not apply to existing investments. This does not alter the probability that assets could be stranded – what it does potentially mitigate is the impact of asset stranding risk by enabling Aurizon Network to recover its return on capital earlier.

The 2010 Undertaking also includes an ability for Aurizon Network to propose 'access conditions' on Significant Investments. This includes adjustments to cash flows for additional risks. In the event access seekers do not agree to such an adjustment and the QCA is required to approve it, Aurizon Network must (amongst other things) demonstrate that the:³

...adjustments are reflective of the possible outcomes and probabilities of the outcomes as a consequence of such risks...

As outlined above, it would be extremely difficult to assign probabilities to asset stranding risk. It would become easier if the likelihood of asset stranding materially increased (for one or more of the reasons outlined above), in which case we expect that it will most likely be too late for Aurizon Network to mitigate its risk by increasing

¹ Port Jackson Partners. (2012). Regaining our competitive edge in mineral resources, prepared for the Minerals Council of Australia – Minerals Week Presentation. Available from: http://www.minerals.org.au/file_upload/files/presentations/120530_MCA_presentation_FINAL.pdf [Accessed 12 June 2012].

² The Australia. (2012). Bring in miners or miss best of boom. Available online: <http://www.theaustralian.com.au/national-affairs/industrial-relations/bring-in-miners-or-miss-best-of-boom/story-fn59noo3-1226373082161> [Accessed 12 June 2012].

³ 2010 Undertaking, section 6.5.4(f)(iii)

prices further (as this would only serve to exacerbate the problem). While we agree that some consideration of probabilities is reasonable in theory, in practice the 'burden of proof' that we expect would be imposed by the QCA would require a degree of precision that is unlikely to be able to be satisfied. We would not expect that an unregulated firm would price stranding risk in this way. Instead, it is possible that it would simply apply a gross-up to its required rate of return.

Risk of a change in the preferred traction choice

Aurizon Network also faces stranding risk on its electric network assets. Even if the demand for export coal remains strong, the risk here is that the demand for electric services is insufficient to recover the cost of installing the electric network assets (including a return on and of capital).

In 2012 Aurizon Network submitted a Draft Amending Access Undertaking (DAAU) proposing a revised pricing framework that would enable it to mitigate its stranding risk.⁴ That DAAU has since been withdrawn while Aurizon Network negotiates with the QCA and with users as to an alternate approach. The risk to Aurizon Network is that the QCA does not accept its arguments and the assets become increasingly underutilised and, eventually, optimised.

Risk that the QCA does not accept the full amount of capital expenditure

Aurizon Network is also exposed to the risk that the QCA does not approve the full amount of any new capital expenditure for inclusion of the Regulatory Asset Base (this expenditure could be for a new investment or the upgrade or renewal of existing network infrastructure). The QCA assesses the prudence and efficiency of capital expenditure in three areas, being scope, standard and cost. Aurizon Network is exposed to regulatory risk in all of these areas.

Aurizon Network can mitigate the risk of scope optimisation by seeking pre-approval of scope under the customer voting process outlined in Schedule A. It can also seek pre-approval of standard where the scope of works has been approved. The main mitigant for the cost of works is pre-approval of the procurement strategy, based on the process outlined in section 3.1.3 of Schedule A.

Risk of asset optimisation due to an assessed deterioration in network condition

The other source of stranding risk is where the QCA optimises the Regulatory Asset Base because of a deterioration in the condition of the network assets (below a

⁴ QR Network (2011). Submission to QCA: Electric Access Draft Amending Access Undertaking, December.

standard that reflects good engineering practice). Under section 1.4(d) of Schedule A of Aurizon Network's 2010 Undertaking, the QCA can now optimise the asset if it determines that:

...the Rail Infrastructure has deteriorated by more than would have been the case had good operating practice and prudent and effective maintenance and asset replacement policies and practices been pursued.

Aurizon Network is responsible for ensuring that the network is maintained in a condition that reflects good engineering practice, and which meets safe working and other regulatory requirements. However, the connection between this obligation and the optimisation of the Regulated Asset Base exposes Aurizon Network to a new source of regulatory risk, which is that the QCA does optimise the RAB for asset condition because:

- it had not been fully compensated for its prudent and efficient maintenance costs (or renewals expenditure) via the allowance approved at the start of the regulatory period; or
- the QCA unreasonably determines that the network condition does not meet the standard required under section 1.4(d), noting that a degree of judgement needs to be applied in determining:
 - what constitutes “good operating practice and prudent and effective maintenance and asset replacement policies and practices”; and
 - whether these standards have in fact been met.

The QCA applied this in UT3 by applying a \$107 million impairment for ballast fouling. It has therefore demonstrated a clear willingness to make retrospective adjustments to the asset base under this provision. We are not aware of any other regulated business in Australia that is exposed to this risk.

At least some of this risk is within Aurizon Network's control as it is responsible for making decisions regarding the operation and maintenance of the asset. In this regard, we note that planned and unplanned possessions (including emergency or urgent possessions) are included under the definition of 'Aurizon Network cause'. Under the take-or-pay provisions, tonnages that were not delivered due to an Aurizon Network cause cannot be recovered via take-or-pay.

This is therefore a source of both commercial and regulatory risk to Aurizon Network.

2.1.2 Is the risk systematic or non-systematic

Stranding risk is asymmetric in nature (as there is only downside risk). It is therefore non-systematic in nature. The nature of regulatory risk is assessed below.

2.1.3 Is the risk currently compensated

The QCA has previously acknowledged that the CAPM does not compensate the firm for asymmetric risk.⁵ These risks are not currently compensated via the WACC or elsewhere in the cash flows.

2.2 Revenue risk

For a regulated business, revenue risk can be defined as the risk that it does not earn sufficient revenue to recover its (efficient) costs, including a “return on investment commensurate with the regulatory and commercial risks involved”. Excluding the risk of failing to recover the full economic cost of an asset over the life of the asset (or asset stranding risk, which is examined separately below), under a revenue cap form of regulation, the key sources of revenue risk to Aurizon Network are outlined below.

A number of the risks are regulatory risks. Regulatory risk is examined in more detail in section 3.

2.2.1 Risk that Aurizon Network does not fully recover its costs if volumes fall

Nature of the risk

Under the revenue cap form of regulation, volume risk is transferred to users. However, only tariffs AT₂ to AT₅ are included in the scope of the revenue cap. AT₁ reflects the incremental maintenance costs associated with increases in volume. Importantly, the costs underpinning AT₁ comprise maintenance costs that are genuinely variable in the short-run, and costs that are fixed in the short-run. This treatment is consistent with the intention that the cost causative components of Aurizon Network’s tariff structure reflect long-term rather than short-term impacts. In UT1, the rationale provided by the QCA was as follows:⁶

⁵ Queensland Competition Authority (2010). Draft Decision: QR Network’s 2010 DAU - Tariffs and Schedule F, June, p.48 (footnote 13).

⁶ Queensland Competition Authority (2000). Draft Decision on QR’s Draft Undertaking, Volume 3 - Reference Tariffs, December, p.54.

...it is critical to note that long term decisions are affected by the reference tariff structure. Consequently, the signals that are implicit in the charging structure should be based on long term rather than short term considerations. It would seriously undermine the efficacy of the above-rail market if there were frequent, substantial and unpredictable changes in these pricing signals.

Aurizon Network has advised that the proportion of its maintenance costs that are fixed in the short-run is 62%. If volumes are lower than forecast, AT₁ revenue will be lower and Aurizon Network will be unable to recover the proportion of that shortfall that is necessary to cover its short-run fixed costs. It is understood that Aurizon Network intends to mitigate this risk by bringing the fixed component of its AT₁ costs within the scope of the revenue cap. The longer term source of risk is that access holders do not renew contracts as they expire, there are no other mines seeking equivalent rights on similar terms, and the then prevailing level of demand is insufficient to support a regulated return on the asset base. This could occur for a number of the reasons identified under stranding risk (such as a decline in the competitiveness of Queensland coal exporters). Aurizon Network is not protected from this risk.

Is the risk systematic or non-systematic

Aurizon Network's volume risk does have a systematic element because of the importance of the Queensland export coal industry to the performance of the Queensland economy. We examined this issue in detail previously in a review of the cost of equity to apply to the below rail network that was submitted to the QCA as part of the UT3 review. It is noted that despite the commodity price downturn and the consequent reduction in the value of coal exports, in the December quarter of 2012 exports of coal, coke and briquettes still comprised 40% of Queensland's merchandise exports.⁷

Is the risk currently compensated

Systematic volume risk should be compensated by beta, however it is assumed that this risk is largely mitigated via the revenue cap form of regulation. If Aurizon Network remains exposed to volume risk on the fixed component of costs reflected in AT₁ it is exposed to risk for which it is not currently compensated. However, this exposure is not material and if Aurizon Network's proposal to bring the fixed AT₁

⁷ Queensland Treasury and Trade (2013). Queensland Economic Review, January, p.3. It also notes that since 2002, "a significant proportion of coal exports (particularly pulverised coal injection (PCI) exports) has been classified as confidential by the ABS. Accordingly, these exports are included in the 'confidentialised items' category, along with sugar and some processed metal exports." This is a separate category within merchandise exports.

costs within the scope of the revenue cap is accepted, this will reduce this exposure further. In the longer term, Aurizon Network still remains exposed to the risk of contracts not being renewed, or a more sustained and material downturn in the Queensland coal industry.

2.2.2 Risk that Aurizon Network is not fully compensated for its efficient operating, maintenance and/or capital costs

Nature of the risk

As noted in section 1, Aurizon Network is entitled to recover the efficient costs of providing access to the service. Its allowances for operating and maintenance costs are set at the beginning of each regulatory period. Consistent with the CPI minus X methodology, the QCA may also impose an X factor adjustment (which is deducted from CPI as part of the annual indexation of Reference Tariffs), which is seen as serving as an efficiency target.

During the course of the regulatory period, Aurizon Network is entitled to seek a 'reopening' of its maintenance cost allowance under the Review Event provisions (in certain circumstances), where the cost impact on Reference Tariffs would be more than 2.5%. This can be used to address increases in maintenance costs, including changes in maintenance practices requested by a user. It also covers Force Majeure events that have an impact of greater than \$1 million.

The Endorsed Variation Event provisions also allow prices to be reopened (again, where the cost impact on Reference Tariffs would be more than 2.5%). This covers changes in law or taxes, changes in electricity distribution or transmission pricing or a change to the QCA levy.

The main risks that can be controlled by Aurizon Network are that:

- its actual costs are not prudent and efficient; and
- it incorrectly forecasts its operating and/or maintenance cost allowances, for example, its forecast costs do not reflect:
 - the actual relationship between volumes and maintenance activity;
 - the actual relationship between activity and cost.

There are a number of regulatory risks that cannot be controlled by Aurizon Network. These are that:

- the QCA does not approve the full amount of Aurizon Network's cost allowances where that cost allowance does actually reflect prudent and efficient costs. In other

words, the QCA and/or its consultant takes a different view on what is prudent and efficient expenditure;

- Aurizon Network applies for a mid-period price reopening for one of the reasons described above, and the QCA does not approve all or part of the claim;
- the QCA imposes unreasonable efficiency targets. For example, in the previous undertaking review the QCA imposed an X factor that was based on a 2004 review undertaken by the Economic Regulation Authority in Western Australia (in the context of a different network that is subject to different operating and environmental conditions).

In making its decisions the QCA needs to have regard to a number of matters set out in the QCA Act, including the factors affecting the approval of a draft access undertaking (section 138) and the pricing principles (section 168A). However, the QCA can exercise considerable discretion in making these decisions. While the regulator needs to have some discretion this also creates uncertainty for the regulated business (and for those seeking access).

It is important to highlight that this discretion is constrained by standards of reasonableness, but is not subject to a reasonableness test. That is to say, the QCA can reject a proposed cost allowance where it acts reasonably in doing so, but is not constrained from rejecting a cost proposal that is reasonable.

Is the risk systematic or non-systematic

The main risk that cannot be controlled by Aurizon Network here is regulatory risk. This is discussed further in section 3.

Is the risk currently compensated

It is not proposed that Aurizon Network be compensated for risks that are reasonably within its control. However, Aurizon Network should be entitled to compensation for risks that it cannot directly control, including regulatory risk (as specified under the QCA Act). To the extent that this risk is not systematic (or is asymmetric), it is not currently compensated.

2.2.3 Risk that Aurizon Network does not fully recover its revenue due to non-performance

Nature of the risk

Under the revenue cap adjustment (as set out in Schedule F of Aurizon Network's 2010 Undertaking), Aurizon Network is entitled to recover any shortfalls in revenue (relative to System Allowable Revenue) excluding any revenue not recovered due to Aurizon Network's breach or negligence. This exposure is up to 10% for each origin-destination pair during the relevant year. Aurizon Network also indemnifies access holders for any losses suffered as a consequence of its wilful default or negligence.

The risk of breach or negligence should be largely within the control of the business. However, this assumes that the business is adequately resourced to manage its risk. For a regulated business, this will depend on its operating and maintenance cost allowances, which is also a source of regulatory risk (discussed further below).

Aurizon Network is also exposed to the risk that a shortfall in the number of services delivered is wrongly attributed to its own breach or negligence. In practice, in an integrated coal logistics chain attributing responsibility for non-performance can be complex. Under Schedule F it is the QCA who must make this assessment. It may not have the information, or the requisite expertise, to make this assessment. This therefore exposes Aurizon Network to an additional source of regulatory risk.

Aurizon Network is also responsible for the ongoing integrity and performance of the network infrastructure. Again, it would be expected that this risk is largely within the control of the business. However, as a regulated business Aurizon Network is exposed to the risk that the QCA disallows necessary capital or maintenance expenditure through exercising its discretion in a way that differs from a regulatory proposal (even where the proposed allowance was reasonable). Aurizon Network is also now exposed to the risk of asset optimisation for asset condition, as discussed in section 2.1.

Aurizon Network has also recently submitted a Draft Incentive Mechanism which will expose up to 5% of its Maximum Allowable Revenue to performance risk. This introduces an additional source of regulatory risk to Aurizon Network, being the risk that an unreasonable determination is made under this mechanism resulting in a loss of revenue.

Is the risk systematic or non-systematic

The main source of risk identified above that cannot be controlled by Aurizon Network is regulatory risk. This is discussed further in section 3.

Is the risk currently compensated

Aurizon Network is entitled to compensation for regulatory risk. To the extent that this risk is not systematic (or is asymmetric), it is not currently compensated.

2.3 Financing risk

2.3.1 Nature of the risk

Financing risk is the risk that the business is unable to raise the funds it needs to finance its business activities, or its cost of funds increases (impacting returns). Section 6.5 allows Aurizon Network to propose a Varied WACC on Significant Investments (that is, investments over \$300 million), which must be approved by the QCA, but only allows variations to the risk-free rate, debt margin and gearing level. Apart from the regulatory risk associated with the approval of a Varied WACC, this does not address the risk that the equity margin is insufficient to compensate equity investors (that is, the equity beta and/or market risk premium is too low).

This risk is unique in a regulated setting because the allowable rate of return set by the regulator is fixed for the regulatory period (apart from the ability to seek a Varied WACC as outlined above) and reviewed each regulatory period. This creates a number of risks, which are described below.

It is also important to consider this within the context of Aurizon Network's obligation to fund all network investments under \$300 million. In other words, Aurizon Network must fund these investments regardless of whether or not it (or its investors) considers that the rate of return is reasonable, including where its actual cost of funds has increased since the start of the regulatory period. It is noted that this was a voluntary commitment that Aurizon Network proposes to remove in UT4.

Risk that the WACC is initially set too low

There is a risk that the WACC set at the start of the period is too low. For example, the risk-free rate could be locked in at an historical low point (like the conditions that are currently being experienced). Regulators generally rely on 'swings and roundabouts', that is, the business might have benefited from locking in their WACC in another regulatory period when rates were comparatively high. However, our concerns with this assumption are that:

- there is no evidence to suggest that the outcomes are symmetric, particularly if the WACC is set during a unique or unusually volatile period in the markets; and

- more importantly, the key issue is whether the WACC provides a return that is commensurate with the rate of return required by investors. This is necessary to ensure that the business can raise capital to fund necessary investments during the regulatory period.

While the expected return on debt is more readily observable the cost of equity is not. The first source of risk here is model error, that is, the model applied by the regulator to estimate the cost of equity does not produce an outcome that is sufficient to compensate investors for risk in the current market environment. For example, a number of issues have been identified with the Sharpe CAPM that is most commonly applied by Australian regulators, in particular, that it tends to understate the beta for utilities.⁸

Regulators continue to rely on observations that the CAPM remains the most commonly applied model in practice. This in turn is based on observations of practices employed by unregulated firms, who have considerably more flexibility in adjusting parameters for current market conditions (for example, increasing the market risk premium if their view is that the expected returns required by investors are currently higher than a CAPM-derived cost of equity would imply). More importantly, they can apply adjustments to the WACC (or their required hurdle rate) to deal with uncertainty – such practices are less likely to be readily acknowledged or reported by firms.

The other key source of risk is that the parameters within the model are not correctly estimated. This is a particular risk for beta, which is a key driver of the cost of equity. In the case of Aurizon Network, there is no ‘pure play’ listed stand-alone regulated coal network business that can be used as a comparator (and even if there was, reliance on one firm, or a very small number of firms, materially increases the risk of estimation error). Estimation error could arise in a number of ways:

- the sample of comparator firms is not appropriate (for example, we do not consider that the QCA’s continued reliance on electricity network businesses is an appropriate reference for Aurizon Network);
- the regulator fails to make adjustments for differences in risk between the comparators and the target firm;
- estimation error, that is, the estimated betas do not reflect the ‘true’ beta of the firm;

⁸ For example, refer: E. Fama and K. French (2004). The Capital Asset Pricing Model: Theory and Evidence. The Journal of Economic Perspectives, 18(3), pp.25-46.

- the regulator makes inappropriate adjustments to the beta.

The market risk premium can be more readily observed but only based on historical data. Particularly in difficult and uncertain market conditions, the historical market risk premium may not reflect the expected market risk premium (which is what we are required to estimate here).

Risk that the cost of funds increases during the course of the regulatory period

It is possible that the actual cost of funds increases above the regulated WACC during the course of the regulatory period. As outlined above, the cost of debt is more readily observable. A regulated firm may (or may not) be able to employ hedging strategies to seek to align the regulated cost of debt with the actual cost of debt on existing borrowings.

The other risk to the cost of debt is the interest rate risk on new borrowings that are undertaken during the course of the regulatory period (as prices will be based on the regulated cost of debt). Depending on the timing of the borrowing, and the certainty the firm has for that borrowing (including the amount), it may not always be efficient to hedge that cost at the start of the regulatory period. Further, Aurizon Network is not compensated for the cost of hedging the interest rate risk on new borrowings. Aurizon Network could address this by seeking approval of a Varied WACC, however this is only for Significant Investments. It also has no certainty that the QCA would accept the proposal.

It is also possible that equity investors alter their expectations of the required return on equity during the course of the regulatory period. This could be influenced by a number of factors, including changes in market conditions, changes in the perceived risk of the firm relative to the market, changes in the expected 'cost of risk' (the market risk premium) or changes in the perceived risk of the market as a whole.

Because the cost of equity is not readily observable, it is very difficult to identify any such changes in expectations. If the firm is listed it could be signalled by changes in the firm's share price however this could be due to a number of factors. In Aurizon Network's case, a change in Aurizon's share price could also reflect factors outside of the below-rail network business.

2.3.2 Is the risk systematic or non-systematic

Interest rate risk is a systematic risk. The risk of deviations between the actual and regulated risk-free rate and debt margin is unique to a regulated price setting regime. In the case of an unregulated business, it may increase its prices in response to an

increase in its underlying funding costs. This will depend on the nature of its contracts and the price elasticity of demand.

In the main, the risks described above are regulatory risks. There is a systematic element to these risks to the extent that they impact Aurizon Network's expose to interest rates.

2.3.3 Is the risk currently compensated

As stated above, Aurizon Network is entitled to compensation for regulatory risk. To the extent that this risk is not systematic (or is asymmetric), it is not currently compensated.

3 Regulatory risk

3.1 The nature of regulatory risk

The preceding section has identified a number of sources of regulatory risk. Regulatory risk arises for a number of reasons. The first is information asymmetry. While a regulator can request any information that it reasonably requires to make its assessment, it naturally does not have access to the same information and resources as the regulated business.

The second reason is that the regulator will not necessarily possess the skills, expertise and resources to make decisions on matters of considerable complexity, including network operations and management, maintenance strategies and supply chain logistics.

The third reason is that the nature of price or revenue regulation requires forecasting of inputs that are inherently uncertain, including volumes and costs. Forecasting error is an issue for both Aurizon Network and the QCA.

The fourth reason is that there is no mechanism to assess the reasonableness of a regulatory decision (from the perspective of either Aurizon Network or users of the service), including whether the regulator has made an error. The QCA has considerable discretion under the QCA Act and must make judgements in a number of areas that are subjective. It is unrealistic to expect that the regulator will get it right every time. However, a lack of accountability for decisions can impact the way that a decision is made, including the care that is taken in making that decision and the 'burden of proof' a regulator might impose on the business.

A decision can only be appealed under judicial review. The scope of this review is relatively narrow and is largely confined to matters of law. It does not allow for a review of the reasonableness of the decision or the judgments made by the regulator. As noted previously, while the QCA is required to act reasonably, it is under no obligation to accept a reasonable proposal. That is, provided it has acted reasonably, the QCA is not constrained from rejecting a reasonable proposal simply because it has taken a different view on the merits of that proposal.

3.2 Empirical evidence

Regulatory risk is receiving attention in the literature but little if any attention in regulatory practice. The fact that it does not receive attention in regulatory practice is not surprising because a regulator is unlikely to acknowledge the risk of its own error or poor performance, let alone allow for it in its decision-making.

Ergas et al define regulatory risk via its impact on regulated firms.⁹ It arises when “the interaction of uncertainty and regulation changes the cost of financing the operations of a firm.”¹⁰ To put the issue in context, they examined regulatory decisions made between 1999 and 2001. The reduction in revenue was between 5% and 64% of the value of the regulatory asset base, and the most significant factor was the return on capital.¹¹

They examine two main sources of uncertainty, being:

- market uncertainty, or the uncertainty that would remain if there was no regulatory intervention. It is important to understand the interaction between market uncertainty and regulation because the wider market uncertainty represents the alternatives available to investors and will influence the returns they might require on regulated assets; and
- the uncertainty created by regulatory discretion, as it is not possible to predict the outcomes of regulatory processes in advance. This risk increases with more frequent regulatory resets.

They show why the risk is asymmetric and that:¹²

... even if there is no bias in the regulator’s estimation (so that the expected value of each parameter estimate is equal to the true parameter), the consequences of such errors are asymmetric, to the detriment of the firm’s income.

They also state that there are types of regulation effects that are neither systematic nor diversifiable. An unregulated firm can adjust its prices to respond to market conditions whereas a regulated firm cannot. To the extent that market risk harms the regulated firm’s profitability, this can reduce the firm’s contribution to the risk of the market portfolio, reducing the CAPM-predicted WACC. Accordingly, the risks introduced by regulation are not systematic. However, they are also not diversifiable because no other firms will clearly gain when the regulated firm loses.

Guthrie explored the link between regulatory risk and investment.¹³ He states that the origin of the link is investment flexibility, which is used to maximise the market value

⁹ H. Ergas, J. Hornby, I.Little and J. Small (2001). Regulatory Risk. Paper prepared for the ACCC Investment and Regulation Conference.

¹⁰ H. Ergas, J. Hornby, I.Little and J. Small (2001). p.6.

¹¹ H. Ergas, J. Hornby, I.Little and J. Small (2001). pp.5-6.

¹² H. Ergas, J. Hornby, I.Little and J. Small (2001). p.10.

¹³ G. Guthrie (2006). Regulating Infrastructure: the Impact on Risk and Investment. Journal of Economic Literature, 44(4), pp.925-972.

of the firm. Regulation affects the impact of investment on market value and therefore alters choice. Guthrie shows that incentive regulation discourages investment compared to rate of return regulation where a firm is able to recover all of its costs. The credibility of the regulatory regime is important here, including the likelihood of regulatory opportunism.

Rammerstorfer also examines the impact of regulation on investment incentives.¹⁴ She observes:¹⁵

In this context, environmental issues, security of supply and efficient resource allocation were recently brought into the centre of regulatory interventions, while the respectiveness of regulatory actions on a company's key figures as for example the cost of capital, have taken a back seat. On the one hand, regulators try to assure that a company operates cost-effectively but, on the other hand, intend to prevent them from generating additional returns. This often implies a tightrope walk between consumer protection and company assistance.

The literature that has examined the impact of regulation on investment is reviewed, with regulation either impacting investment directly or via key parameters such as the cost of capital. For example, Brennan and Schwartz found that:¹⁶

...regulation based on the equivalence of cost of capital and the allowed rate of return is not able to provide adequate investment incentives.

Studies that have focussed on more dynamic models of investment behaviour have also found that regulation can have a detrimental impact on investment.¹⁷ Rammerstorfer notes:¹⁸

Although the effective direction of the regulatory impact is disputable, empirical evidence seems to tend toward highlighting the negative influence of regulation.

She models systematic risk under different forms of regulation and shows that price cap regulation leads to higher systematic risk compared to an environment with no regulation. Incentive regulation lies somewhere in between. Overall, a regulated firm

¹⁴ M. Rammerstorfer (2009). Risk Acceptance and Regulatory Risk. *Competition and Regulation in Network Industries*, 10(3), pp.235-258.

¹⁵ M. Rammerstorfer (2009). pp.235-236.

¹⁶ M. Rammerstorfer (2009). p.238.

¹⁷ For example: Dixit (1991), Dixit and Pindyck (1994),

¹⁸ M. Rammerstorfer (2009). p.238.

that is subject to incentive regulation is more likely to avoid investing in risky projects compared to an unregulated firm. She concludes:¹⁹

The most frequent failure in regulatory practice is the inaccurate specification of regulatory risk which leads to the fact that this topic still lies in the centre of regulatory negotiations.

Robinson and Taylor examined the impact of regulatory risk on electricity distribution firms in the UK.²⁰ They examined the volatility of share price returns in the electricity distribution industry and found evidence of regulatory risk, with the conditional variance of returns increasing after 30 significant regulatory risk events. This in turn could have implications for these firms' cost of capital.

Brunekreeft and Meyer also examined the impact of regulation on investment in anticipation of the large investment that is required in European electricity transmission networks.²¹ The authors observe that price-based (or incentive) regulation was designed for inefficient monopolies transitioning to a deregulated environment, with the focus on setting incentives for cost reductions. They state that the focus is moving away from this towards incentivising efficient investment:²²

The regulatory framework needs to set incentives for investment that is necessary, avoid unnecessary investment, and secure that investment comes at least costs.

The major concerns now are regulatory lags, regulatory risk and efficiency risks. One shift has been away from the ex-post benchmarking of expenditure to the use of ex ante investment budgets.

Brunekreeft and Meyer note that the timing of required investments is also important. They conclude that cost-based (rate of return) regulation is more likely to accelerate investment compared to price-based (or incentive) regulation. If timeliness is important, regulators may need to consider mechanisms such as 'rate of return adders' (which are used in the US and Europe and are discussed further below) or an increment to the total allowed return that is not necessarily directly linked to risk.

¹⁹ M. Rammerstorfer (2009). p.255.

²⁰ T. Robinson and M. Taylor (1998). The Effects of Regulation and Regulatory Risk in the UK Electricity Distribution Industry. *Annals and Public and Corporate Economics*. 69(3), pp.331-346.

²¹ G. Brunekreeft and R. Meyer (2011). Regulation and Regulatory Risk in the Face of Large Transmission Investment. *Competition and Regulation in Network Industries*, 12(2), pp.155-172.

²² G. Brunekreeft and R. Meyer (2011). p.157.

3.3 The impact of regulatory risk

The Productivity Commission has previously recognised that regulatory error has asymmetric consequences. It stated:²³

- Over-compensation may sometimes result in inefficiencies in timing of new investment in essential infrastructure (with flow-ons to investment in related markets), and occasionally lead to inefficient investment to by-pass parts of the network. However, it will never preclude socially worthwhile investments from proceeding.
- On the other hand, if the truncation of balancing upside profits is expected to be substantial, major investments of considerable benefit to the community could be forgone, again with flow-on effects for investment in related markets.

In the Commission's view, the latter is likely to be a worse outcome.

This is particularly important in the case of WACC. The estimation of WACC is inherently imprecise and hence the probability of specifying a WACC other than the 'true' value is high. For key parameters such as beta, there is likely to be a range of reasonable estimates rather than a precise value. The Australian Competition Tribunal ('the Tribunal') has previously recognised the range of reasonable outcomes within which a Reference Tariff determination could fall:

...there is no single correct figure involved in determining the values of the parameters to be applied in developing an applicable Reference Tariff. The application of the Reference Tariff Principles involves issues of judgement and degree. Different minds, acting reasonably, can be expected to make different choices within a range of possible choices which nonetheless remain consistent with the Reference Tariff Principles.²⁴

The QCA also recognised this when it was developing Aurizon Network's first undertaking:²⁵

The difficulties outlined above merely serve to highlight that the calculation of WACC, using CAPM to estimate the return on equity, involves some degree of imprecision and requires judgement to be exercised. In exercising this judgement,

²³ Productivity Commission (2001). Review of the National Access Regime, Report no. 17, AusInfo, Canberra, p.83.

²⁴ Application by GasNet (Australia) Operations Pty Ltd [2003] AcompT 6, para 29.

²⁵ Queensland Competition Authority (2000). Draft Decision on QR's Draft Undertaking, Volume 3 - Reference Tariffs, p.216.

the Authority considers that regard must be had to the fact that considerably more social harm could be caused by selecting too low a rate of return (leading to no investment in the network) than one that is at the upper bound of a reasonable range.

While this risk is particularly high in relation to WACC it is also significant in a number of other areas of the revenue determination, as discussed in section 2.

3.4 Addressing regulatory risk

As outlined above, unless regulatory risk impacts a firm's exposure to certain systematic risks (such as interest rates or inflation), it is likely to be neither systematic nor diversifiable.

It is extremely difficult to estimate regulatory risk. It requires an estimate of both impact and probability. While the impact could be measured quite readily under different scenarios, the probability of this risk cannot be readily estimated. We would also expect that it would be naturally difficult for a regulator to be unbiased in assessing the probability of error in its own decision-making.

The most effective approach to addressing regulatory risk is likely to be institutional reform, including allowing for appeals mechanisms such as merits review or more light-handed regulation where appropriate (relying instead on commercial negotiation). Clearly, major structural reform that would require legislative change is not an option for Aurizon Network for the next regulatory review.

In the absence of being able to calculate a probability-adjusted cash flow impact it is difficult to make any adjustment to the cash flows. The only other alternative is to make an adjustment to the WACC, either by selecting the point estimate from the upper bound of the range, or adding a specific increment to the rate of return.

The Independent Pricing and Regulatory Tribunal (IPART) has previously recognised the risk of underinvestment in its WACC decisions for ARTC. IPART's practice is to set a range for the WACC (rather than specifying point estimates for each parameter) and then select a point estimate from within that range. In its 2009 decision on the rate of return to apply to ARTC's Hunter Valley Coal Network, it set the estimate at 60 basis points above the mid-point of the range. It stated:²⁶

²⁶ Independent Pricing and Regulatory Tribunal (2009). New South Wales Rail Access Undertaking – Review of the Rate of Return and Remaining Mine Life from 1 July 2009, Rail Access – Final Report and Decision, p.5

It balances the risks appropriately as IPART considers that the costs of underinvestment in the rail infrastructure are high and exceed those attached to overinvestment given the importance of the rail infrastructure to the total coal supply chain in the Hunter Valley. IPART has provided an allowance of 60 basis points to take account of these risks. This is consistent with the 2005 decision for rail access.

More recently, it also selected the WACC estimate from above the mid-point of the range in a number of recent water decisions, including its determination for the Sydney Desalination Plant. This was in recognition of the difficult global financial market conditions:²⁷

For this review, we consider that the value of the risk free rate is currently well below long term averages and that there is a high level of market uncertainty. We consider the risks in setting a 5-year determination in the current conditions are more significant than under normal market conditions.

An alternative is to allow for an explicit margin in addition to the rate of return, which recognises the uncertainty associated with regulatory decision making and the impact that this uncertainty can have on investment incentives. For example, as mentioned above, in the US electricity transmission networks can now apply to the Federal Energy Regulatory Commission (FERC) for a 'rate of return adder', which is an increment to the total required rate of return (which has been in the order of 1% to 3%). In order for this to be approved, one of two criteria must be met:

1. the investment removes network congestion and would reduce price differences between markets (economic investment); or
2. the investment contributes to supply security and system reliability (reliability investment).²⁸

That is, the increment is not linked to risk, nor is it predicated on demonstrating an increase in risk. However, it does require the investment to be in the public interest.

In introducing this policy FERC noted its focus on setting a range of returns rather than a single number:²⁹

²⁷ Independent Pricing and Regulatory Tribunal (2011). Review of Prices for Sydney Desalination Plant Pty Limited, Water – Final Report, p.93.

²⁸ G. Brunekreeft and R. Meyer (2011).

²⁹ Federal Energy Regulatory Commission (2006). Promoting Transmission Investment Through Pricing Reform, Order No.679, para.22.

The traditional policies that we re-examine here reflect both fundamental precepts: the need to balance investor and consumer interests and the recognition that there is no single formula for doing so. For example, in ensuring that rates produce adequate returns for investors, we do not set a single return on equity for all public utilities, nor do we presume that there is only one return on equity that is appropriate for any individual utility. Rather, our precedents require the establishment of a range of returns and we select an ROE within that range that reflects the facts and circumstances of a particular case.

Overall, the policy recognises the need to provide investors with an appropriate incentive to encourage investment in new transmission infrastructure. It also introduced certain measures to reduce the risk on investments, such as the recovery of abandoned plant costs if a project is abandoned for reasons beyond the control of the regulated entity.

The concept of a price or rate of return adder has also been introduced in Italy and France.

Clearly, Aurizon Network is not investing in electricity transmission infrastructure. However, ensuring that the supply chains in the Central Queensland Coal Region have sufficient network capacity in order to continue to capitalise on strong coal demand and favourable coal prices is in the public interest, given the creation of employment, the direct and indirect effects on industries and the royalties and taxes collected by government.

There needs to be adequate regard to Aurizon Network's incentives to invest in the face of considerable market uncertainty and importantly, the uncertainty created by regulatory risk. This is considered especially important here given the QCA's continued focus on arriving at a single WACC estimate, and the risk of error with such an approach.

4 Comparison with other regimes

This section will compare general approaches used by other Australian regulators, focussing on the heavy haul rail industry. It will focus on the categories of risk assessed above, being revenue risks, financing risk and stranding risk. Because regulatory risk is inherent to all of these categories, it is not examined separately. No Australian regulator has specifically addressed the issue of regulatory risk, although we note that it is not explicitly required under all of the relevant legislation. However, we contend that consideration of regulatory risk is required under section 168A(a) of the QCA Act.

The comparisons are summarised in the following table. We examine ARTC's Hunter Valley coal network, The Pilbara Infrastructure (the WA Rail Access Regime) and National Electricity Rules. The reason we have examined the National Electricity Rules is because the QCA has more recently relied on perceived parallels between Aurizon Network and electricity network businesses.

Table 1 Commercial and regulatory risks: comparisons with other regulatory regimes

Area	ARTC Hunter Valley	WA Rail Access Regime	National Electricity Rules
1. Legislative context	Pricing principles in the <i>Competition and Consumer Act 2010</i> require compensation for commercial and regulatory risks.	<p><i>Railways (Access) Code 2000</i> (the Code) requires the regulator to determine the WACC (but does not prescribe what is compensated). It also defines “capital costs” as comprising “both the depreciation and risk-adjusted return on the relevant railway infrastructure” (Schedule 4 of the Code).</p> <p>An important overarching difference is that parties can choose to negotiate an access agreement outside of the Code. If this is the case, neither party will be able to rely on the protections under the Code, but they are also not bound by its obligations.</p>	<p>The pricing principles in the National Electricity Law require that prices should allow for a return commensurate with regulatory and commercial risks. Section 6.2.5(b) of the National Electricity Rules (NER) states that the rate of return is “measured by the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risk”. Further, section 6.5.2(c) provides that the return should be commensurate with the prevailing market conditions for funds and the risks involved in providing the services.</p> <p>In its review of the WACC Guidelines to apply to electricity network businesses, concluded in 2009 (the Statement of Regulatory Intent (SoRI)), the Australian Energy Regulator (AER) made reference to the pricing principles contained in the National Electricity Law but stated that it should only consider non-diversifiable risks in the WACC. Diversifiable risks can be compensated by “other mechanisms”.³⁰</p>
2(a) Revenue risk: that the business does not fully recover its revenues if volumes fall.	<p>ARTC is subject to a revenue cap form of regulation based on the approved costs using the building blocks methodology. This protects ARTC from volume risk on the constrained network. On the unconstrained network, ARTC is able to capitalise its losses for recovery at a later period.</p> <p>Revenue is recovered/returned base on an annual ‘overs and unders’ adjustment, which is implemented via the True Up Test. The first step in this test is whether ARTC has made sufficient paths available during the relevant period (Network Path Capability). This takes into account</p>	<p>The Overpayment Rules require the maintenance of an ‘overs and unders’ account that is managed over a three year period. This tracks the difference between total revenue and total costs. The recovery of costs is first prioritised to incremental costs, followed by branch and feeder route sections, and then shared mainline sections (that is, the priority is on the recovery of costs that could not otherwise be recovered from other users).</p> <p>Overpayments will either be paid back to users or credited to the overpayment account (if less than</p>	Firms are subject to a revenue cap form of regulation based on the approved costs using the building blocks methodology.

³⁰ Australian Energy Regulator (2009). Final Decision. Electricity Transmission and Distribution Network Service Providers. Review of the Weighted Average Cost of Capital (WACC) Parameters, May, p.58.

Area	ARTC Hunter Valley	WA Rail Access Regime	National Electricity Rules
	<p>actual path usages, as well as maintenance losses or other losses caused by ARTC (see below).</p> <p>The next step is to rebate charges via the annual reconciliation. This involves rebating the fixed component of the access charge on contracted paths that were not delivered, unless the paths were lost because: there was no valid operator nominated, there were no exit rights, or a cancellation penalty was applied.</p>	<p>10%). Underpayments will also be applied to the account. They can be carried forward to subsequent periods in certain circumstances.</p>	
2(b) Revenue risk: that the business is not fully compensated for its efficient operating, maintenance and/or capital costs.	<p>The ACCC will assess whether ARTC has incurred efficient operating and maintenance costs as part of the annual system True Up Test (see 4.10).</p> <p>The ACCC will review whether or not ARTC's costs are efficient. However, no X factor or other target has been imposed.</p> <p>There is limited experience with this new regime to assess the detail that the ACCC may go into in making this assessment, or to enable us to form any opinion on ARTC's exposure to regulatory risk (the first assessment was submitted to the ACCC for review in June 2012).</p>	<p>Floor and ceiling costs are reviewed every three years, which requires a review of all of the underlying cost inputs. For capital expenditure, it is assumed that assets are constructed to a Modern Equivalent standard. It would appear that much of the focus of capex reviews has been on the unit rates (costs).</p> <p>Tariffs are currently escalated at 75% of CPI. This is required under the regulator-approved Costing Principles.</p>	<p>The AER undertakes a detailed review of forecast operating, capital and maintenance expenditure for prudence and efficiency. Accordingly, regulatory risks will arise here. However, the businesses have recourse to merits review to appeal decisions.</p> <p>An X factor is applied and reviewed by the each regulatory period. The regime also includes an Efficiency Benefit Sharing Scheme, which is intended to provide the businesses with an incentive to reduce costs by allowing them to retain a share of the gains over a five year period.</p>
2(c) Revenue risk: that the business does not fully recover revenue due to non-performance.	<p>A System Availability Shortfall is where the Network Path Capability is less than the Total Path Usages Required. The latter includes paths used for maintenance, paths that were unavailable due to system losses arising from ARTC, and the lesser of actual and forecast system losses arising from other parties (excluding specified Availability Exceptions, such as passenger services).</p> <p>ARTC is therefore liable for not making the network available due to its own breach or negligence. There is no cap on this liability. However, the True Up Test is applied at a pricing zone level, not an origin-destination level.</p> <p>ARTC must report on a number of KPIs that address network and system performance. ARTC had submitted a performance incentive scheme to the ACCC but that was withdrawn in December</p>	<p>The Overpayment Rules are only based on the difference between total revenue and total costs. There is no allocation of cause for the non-delivery of paths, nor are there any adjustments for TPI's breach or negligence.</p> <p>Under the regulator-approved Train Management Guidelines, the inclusion of any Key Performance Indicators, and the consequence of any non-performance against those KPIs, are left to negotiation between the parties under the access agreement.</p>	<p>Performance is addressed via the Service Target Performance Incentive Scheme. This has two components, being:</p> <ul style="list-style-type: none"> • a service component, which provides a financial incentive to improve performance standards (and thereby counter any perceived incentive to reduce costs under the revenue cap form of regulation). The financial impact is limited to 1% of Maximum Allowable Revenue; • a market component, which rewards performance against specific targets. The financial impact is limited to 2% of Maximum Allowable Revenue.

Area	ARTC Hunter Valley	WA Rail Access Regime	National Electricity Rules
	2012.		
3. Inflation risk	The RAB is rolled-forward annually for actual inflation (with the return on and of capital based on this rolled-forward amount). Efficient costs are assessed on an annual basis (and will therefore reflect actual inflation).	The ERA updates inflation as part of the annual review of WACC parameters. Ceiling revenues are updated annually based on the updated WACC and inflation inputs.	The RAB is rolled forward annually for actual inflation. During the term of the regulatory period, allowed revenues are updated based on actual inflation and the approved X factor.
4. Financing risk	<p>ARTC cannot be required to fund an investment. A user funding mechanism is in place if ARTC does not want to fund network investment. It is noted that certain Financial Criteria must be referenced in making this decision, which include the “opportunity cost to ARTC given the relative risk and returns associated with the financing of the listed and new projects relative to other investment opportunities” (Indicative Access Holder Agreement, section 4.4). The satisfaction of these criteria is based on ARTC’s opinion. In any case, while it must report its reasons to the Rail Capacity Group (RCG) it cannot be compelled to invest.</p> <p>The ACCC must approve ARTC’s WACC. In the most recent determination it endorsed the WACC agreed between ARTC and industry and accordingly did not review the parameters in detail.</p>	<p>There is no obligation on the railway owner to fund investment. An access determination can require the railway owner to extend or expand the facility but only where the proponent: (1) has the necessary financial resources to pay any costs relating to the extension or expansion for which the proponent is liable; and (2) is able to secure such payment in a way that the arbitrator considers satisfactory (section 33(4) of the Code).</p> <p>The Economic Regulation Authority undertakes a full WACC review once every five years. The WACC is updated annually for the risk-free rate, inflation and debt margin.</p>	The WACC for electricity network businesses will be based on the SoRI, which is reviewed once every five years. Electricity transmission network businesses must adopt the SoRI parameters and methods (risk-free rate and debt margin are assessed based on current market rates). Electricity distribution network businesses can depart from the SoRI parameters if they have “persuasive evidence” to do so. They can also currently appeal decisions (but not the SoRI itself) under merits review.
5. Stranding risk	<p>If capital expenditure has been endorsed by the RCG, the ACCC will not undertake an ex post assessment of whether the expenditure was prudent.</p> <p>ARTC’s undertaking is silent on future RAB optimisations.</p>	<p>In its review of the WACC to apply to The Pilbara Infrastructure, the Economic Regulation Authority indicated that stranding risk will be considered in future determinations of floor and ceiling costs.³¹</p> <p>The regulator-approved Costing Principles explicitly state that: “TPI will include an allowance for asymmetric risk as an annual operating cost in its model and in its floor and ceiling cost proposal. The quantum of the allowance and methodology will be reviewed by the ERA as part of the floor and ceiling cost determinations.”³²</p>	<p>The RAB roll-forward adjusts for any difference between actual and forecast capital expenditure. However the detailed review of the prudence and efficiency of the expenditure is done upfront – the AER does not revisit this ex post.</p> <p>The NER does not explicitly provide for any future optimisation of the RAB for distribution network businesses. However, it does allow for this in the case of transmission. An asset (or group of assets) can be removed from the RAB if it is no longer required to provide the regulated service,</p>

³¹ Economic Regulation Authority (2009). The Pilbara Infrastructure (TPI). Final Determination on the 2009 Weighted Average Cost of Capital for TPI’s Railway Network, 22 June.

³² The Pilbara Infrastructure (2010). Costing Principles, The Pilbara Infrastructure, Approved June 2010, p.17.

Area	ARTC Hunter Valley	WA Rail Access Regime	National Electricity Rules
		<p>The Code requires the use of the Gross Replacement Value asset valuation methodology. This assumes a hypothetical new greenfields railway that is built to a Modern Equivalent Asset standard, and has the capacity to meet actual and reasonably projected demand. This is reviewed once every five years as part of the review of floor and ceiling costs. Under this approach, TPI could experience increases or decreases in the RAB value.</p>	<p>is dedicated to one user or a small group of users, has a value that exceeds \$10 million and the service provider has not adequately sought to address the risk of redundancy of that asset (Schedule 6A.2.3).</p>

To summarise, some of the key differences between the commercial and regulatory risks borne by Aurizon Network compared to other regimes include:

- the ACCC has not imposed an X factor on ARTC. The QCA has applied an X factor to Aurizon Network that is based on a Western Australian study that is of questionable relevance to the Central Queensland coal network. X factors have also been applied by the ERA (TPI) and the AER;
- Aurizon Network is the only party that bears inflation risk on its revenues during the course of the regulatory period (being exposed to the difference between actual and forecast inflation for the purpose of calculating the return on, and of, capital allowances);
- it is difficult to draw any definitive conclusions regarding each regulator's review of forecast capital, operating and maintenance expenditure however the reviews by the QCA and AER would appear to be far more detailed (and intrusive) than the other regimes. Two key differences between the NER and the other regimes is that:
 - the NER places more constraints around the regulator's discretion; and
 - regulated energy network businesses have access to merits review, which by no means eliminates regulatory risk, but serves as an important mitigant;
- Aurizon Network and ARTC are both in the process of developing service quality incentive regimes. Electricity network businesses are also subject to a service quality regime. In WA, the inclusion of a KPI regime (and whether there are any rewards or penalties under the regime) is left to negotiation between TPI and access seekers;
- Aurizon Network is exposed to a maximum 10% loss in annual revenue for failing to make the network available due to its own breach or negligence. ARTC will also bear this risk, although there is no cap on this liability. However, ARTC's True Up Test is broader, being applied at a pricing zone level, while Aurizon Network's is applied to each origin-destination pair. No such exposure would appear to exist under the other regimes;
- Aurizon Network is the only service provider that has an obligation to fund investment. The other businesses reviewed do not have such an obligation, consistent with the terms of their legislation (which also reflects the *Competition Principles Agreement*);

- TPI's WACC is reviewed annually for changes in the risk-free rate, inflation and debt margin. This assists in mitigating the interest rate risks on new borrowings undertaken during the regulatory period. The other regimes do not provide for mid-period reviews. Aurizon Network can apply a Varied WACC for a different risk-free rate and debt margin but only for investments over \$300 million (this also must be approved by the QCA);
- Aurizon Network's capital expenditure is subject to a detailed ex post review by the QCA (unless pre-approved under the mechanisms in Schedule A, which currently primarily addresses scope). The ACCC will not undertake an ex post assessment of ARTC's capital expenditure if that expenditure has been approved by the Rail Capacity Group (RCG). In the case of electricity network businesses, while a detailed review of the prudence and efficiency of the expenditure is done upfront as part of the approval of the forecast, the AER does not revisit this ex post (adjustments are still made for the difference between forecast and actual expenditure as part of the RAB roll-forward);
- Aurizon Network is exposed to the risk of optimisation for both a material reduction in demand and deterioration in asset condition. Neither the ARTC or TPI regimes allow for this. Electricity transmission assets may be removed from the RAB if no longer used (under certain conditions).

None of these other regimes explicitly provide compensation for regulatory risks. However, that does not mean that it should not be compensated.

5 Conclusions

With the historical focus of the return on capital being the CAPM-derived WACC, we contend that this does not satisfy the requirement of allowing a “return on investment commensurate with the regulatory and commercial risks involved”, because:

- this does not include compensation for non-systematic risks; and
- there is no evidence that any regard has been given to regulatory risk (which may or may not be systematic).

While this requirement has always existed there has been no explicit consideration of regulatory risk in previous reviews for Aurizon Network.

As identified above, Aurizon Network is exposed to a number of sources of regulatory risk, including, but not limited to, the determination of its WACC. WACC is particularly important because it has a significant impact on Aurizon Network’s investment incentives. There is evidence to show that regulation does directly impact these incentives. Further, if the WACC is set too low and results in under-investment, the social and economic consequences of this are likely to be worse than over-investment, especially in an economy whose performance is currently so dependent on mining activity.

It is possible that regulatory risk is neither systematic nor diversifiable. It is extremely difficult to estimate regulatory risk because while the impact may be able to be estimated (under a range of scenarios), the probability is much more difficult to estimate.

One possible approach that has been applied to deal with this issue is to select the WACC from the upper bound of a range. For example, this practice has been previously applied by IPART in setting the WACC for ARTC’s Hunter Valley coal network and has recently been applied in a number of water decisions.

An alternative is to allow for an explicit margin in addition to the rate of return, which recognises the uncertainty associated with regulatory decision making and the impact that this uncertainty can have on investment incentives. Such an approach has been applied in electricity transmission in the US and Europe.

Such investment clearly needs to be in the public interest. Ensuring that the supply chains in the Central Queensland Coal Region have sufficient network capacity in order to maximise the value of the state’s mineral resources is in the public interest.