IPART
New South Wales

Independent Pricing and Regulatory Tribunal

NSW Rail Access Undertaking - Review of the rate of return and remaining mine life

From 1 July 2014

Transport — Final Report and Decision
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1 Executive Summary

The NSW Rail Access Undertaking (the Undertaking) provides for third party access to the rail network in NSW of which RailCorp, the Australian Rail Track Corporation (ARTC) and Transport for NSW (TfNSW) are the owners.

Schedule 3 of the Undertaking sets out the pricing principles that must be followed by the owners when setting access prices. Under Schedule 3, IPART is responsible for determining whether owners comply with these pricing principles.

Schedule 3 requires IPART to review the rate of return and remaining mine life of the Hunter Valley coal mines serviced by the rail network every five years.

The rate of return is applied to the regulatory asset base (RAB) of the rail network to yield a return for the five years commencing 1 July 2014. The remaining mine life determines the rate of depreciation charged over the same period.

1.1 Overview of our final decisions and recommendations

Our final decisions are that from 1 July 2014:

1 The rate of return that should apply from 1 July 2014 is 5.9% per annum on a real post-tax basis. 12

2 The remaining mine life from 1 July 2014 should be increased to 30 years, resulting in a terminal date of 2044. 20

We also make the following final recommendation:

1 That as part of its review of the Undertaking, Transport for NSW (TfNSW) investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime. 11

Our final decision on rate of return is slightly lower than the rate of return determined in our draft decision, because of slight changes in market parameters between the draft and final decisions.

Our final decision on the rate of return is made in accordance with our standard approach to calculating the weighted average cost of capital (WACC) for regulated businesses. This aims to provide regulatory certainty and a buffer against short-term fluctuations in the market. The WACC takes into account new evidence on the industry-specific parameters, including an equity beta of 0.7 to 1.0 and gearing level of 40% to 50%.

Our final decision on the remaining mine life provides an estimate of the useful life of the RailCorp Hunter Valley Coal Network (HVCN) rail sectors. We consider that these sectors will be used to transport coal to power stations located south of the sectors, while these power stations and the Hunter Valley coal mines that supply them continue to operate. We reaffirm our draft decision that the power stations will continue to operate until or beyond the proposed terminal date of 2044.

In relation to our final recommendation, we note that since the ARTC took over operation of the majority of the HVCN, operators who transport freight on RailCorp's remaining sectors have to negotiate access under two different regulatory regimes. We consider that there may be scope for TfNSW to investigate options for reducing red tape as part of its review of the Undertaking.

1.2 Our review process

Our review process involved two stages – the release of a draft report and decisions for public consultation and release of a final report and decisions. We invited stakeholders to make written submissions on our draft report and decisions and held meetings with individual stakeholders to discuss the issues raised in their submissions.

We engaged Sapere Research Group (Sapere) to provide advice on the remaining mine life of the relevant mines that utilise the sectors. We also engaged Frontier Economics (Frontier) to provide advice on the economic lives of two power stations that are located on RailCorp's HVCN rail sectors. Both of these reports are available on our website.

1.3 Structure of this report

This report explains our analysis and final decisions on the rate of return and remaining mine life that we consider should be applied to the rail infrastructure owner. The remainder of the report is structured as follows:

- Chapter 2 discusses the context and scope for this review
- Chapter 3 discusses how we determined the rate of return
- Chapter 4 discusses how we determined the remaining mine life of the relevant Hunter Valley mines utilising the rail sectors.

2 Context and scope for this review

2.1 Our responsibilities under the NSW Rail Access Undertaking

The NSW Rail Access Undertaking (the Undertaking) sets out the rules that govern train operator access to the rail network in NSW, including the negotiation of access prices, and terms and conditions between the train operator and rail infrastructure owner. Schedule 3 of the Undertaking sets out the pricing principles that the rail infrastructure owner must apply when negotiating access prices with the train operators.

2.1.1 IPART determines the compliance of the rail infrastructure owner with the pricing provisions of the Undertaking

Each year, IPART is required to determine the compliance of the owners with specific requirements of Schedule 3 including:

- the Asset Valuation Roll Forward Principles (AVRFP)
- the ceiling test, having regard to the operation of an 'Unders and Overs Account'.

Schedule 3, clause 1(1) states that the ceiling test requires that for any access seeker (or group of access seekers), access revenue must not exceed the full economic costs of the sectors required on a standalone basis for the access seeker.

By 31 October each year, the rail infrastructure owner submits to IPART documents demonstrating its compliance with these two elements for the financial year.

We review the annual full economic costs and annual revenue from rail access charges in the rail infrastructure owner's submission and consult with stakeholders. We then publish a statement of reasons for our decisions on whether the rail infrastructure owner has complied with these two elements of the Undertaking.

Some stakeholders raised concerns about how we determine these costs when assessing compliance of the rail infrastructure owner. For example, Mr Banyard, an individual, raised concerns with operators being required to pay for diesel locomotives, rather than electric locomotives[1] and using annual costs and revenues with no reference to volumes of coal carried or each rail user's share of costs.[2]

1 Mr R. Banyard submission, 20 May 2014, p 1.
2 Ibid, p 2.

The Undertaking requires that full economic costs are assessed based on a hypothetical coal-only network using benchmark costs rather than RailCorp's actual costs. Our statement of reasons on RailCorp's compliance with the Undertaking for 2011/12 and 2012/13 provides an overview of how we determined full economic costs. This document is available on our website.[3]

2.1.2 IPART does not set rail access charges or standards and specifications of access

In submissions on our draft report, some stakeholders raised concerns about how access charges are levied on rail operators, and the standards for loading, unloading and securing coal loads and enforcement of these standards. The Correct Planning and Consultation for Mayfield Group made the following suggestions:

- IPART should set rail access charges that require coal train operators to meet core standards for loading, unloading and securing coal loads
- access charges and penalties should apply to both loaded and unloaded journeys
- access charges should be based on the time of day and duration of rail corridor use.[4]

Mr Banyard, an individual, also raised a number of concerns about access charges and standards, including the suggestions that:

- access charges should be based on base standards and penalty charges should be added where a train operator fails to comply with the standard
  - such specifications should state the wagon weight, dimension, security of load, emission level and other relevant factors
- access charges for all types of journeys – passenger, freight, grain, coal and other - should be set at the same time
- the access charge should cover loaded and unloaded journeys
- the access charge should be based on a unit such as tonnes carried
- environmental costs should be charged to the coal hauliers
- access charges should be time-based.[5]

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3 IPART, *Final Decision - Statement of Reasons - Review of compliance with NSW Rail access undertaking 2011 to 2013*, July 2014 http://www.ipart.nsw.gov.au/files/e735c991-2aa5-4055-9a35-a35d00fcf025/Final_Decision_-_Statement_of_Reasons_-_Review_of_compliance_with_NSW_Rail_access_undertaking_2011_to_2013.pdf

4 Correct Planning and Consultation for Mayfield Group submission, 18 May 2014, pp 1-2.

5 Mr R. Banyard submission, 20 May 2014, pp 1-2.

Under the Undertaking, full economic costs are assessed based on a hypothetical coal-only network using benchmark costs rather than RailCorp's actual costs. The benchmark costs we use in assessing RailCorp's compliance are based on best practice, which assumes RailCorp complies with all relevant safety and environmental standards. In terms of the Undertaking, we do not have any role in setting access prices. Rather, we use the total revenue generated by coal freight on RailCorp's HVCN to determine RailCorp's compliance with the ceiling test. IPART also has no role in setting or enforcing the terms and conditions of train operators' access to the rail network. These are the responsibility of the rail infrastructure owner (RailCorp) and Transport for NSW (TfNSW).

Under the Undertaking, RailCorp negotiates an access agreement with a rail access seeker.[6] This takes place once the access seeker has provided RailCorp with operational specifications which comply with available capacity on the route. The Undertaking defines operational specifications as the technical specifications including time of entry and exit from the route, duration of use, maximum speeds, maximum axle loads, commodities to be transported, technical specifications of rolling stock and operational and safety standards.[7] The agreement that is negotiated must also include a range of agreed terms outlined in Schedule 2 of the Undertaking.

We note that RailCorp also publishes a Train Operating Conditions (TOC) manual on its website.[8] It is a requirement under RailCorp's standard Track Access Agreement for rail operators to comply with the TOC manual, Operational Safety Rules, Operations Protocol, Communications Equipment Standards and Minimum Operating Standards for Rolling Stock Manual.[9] These conditions and standards are enforceable by RailCorp and TfNSW.

We have written to TfNSW to pass on the concerns of the Correct Planning and Consultation for Mayfield Group and Mr Banyard regarding access charges and standards.

2.1.3 IPART does not monitor the compliance of rail operators with environmental licence conditions

Stakeholders raised concerns with pollution and emissions from coal haulage, including from coal that has fallen or is blown from trains throughout their journeys.

6 NSW Rail Access Undertaking, Section 3.
7 NSW Rail Access Undertaking, Schedule 7.
8 http://www.asa.transport.nsw.gov.au/ts/asa-standards#rolling-stock, accessed 4 July 2014.
9 RailCorp Track Access Agreement, Section 6.5.

The Correct Planning and Consultation for Mayfield Group states that the poor standards for securing coal loads is unacceptable and that IPART should set rail access charges that require coal train operators to meet core standards for loading, unloading and securing coal loads.[10]

Mr Banyard, an individual, states that coal trains have high pollution levels due to the coal hauliers failing to secure their loads.[11]

As mentioned previously, the benchmark costs we use in assessing RailCorp's compliance with the Undertaking are based on best practice which assumes RailCorp complies with all relevant safety and environmental standards. Environmental issues relating to railway system activities, such as pollution and emissions from coal haulage are dealt with under the Environment Protection License (EPL) issued by the Environmental Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997*. The EPA is the regulator responsible for dealing with environmental breaches of licence conditions.[12]

As part of our review of RailCorp's compliance with the Undertaking for 2011/12 and 2012/13, we have written to the EPA to pass on the concerns of the Correct Planning and Consultation for Mayfield Group and Mr Banyard.

2.1.4 IPART does not have a direct role in providing access or capacity upgrades for access seekers

Some stakeholders raised concerns about access to the network. Origin Energy stated that the draft decision did not appear to support capacity upgrades needed to ameliorate existing and anticipated coal transport congestion, particularly along the rail line to Newcastle.[13]

Under the Undertaking, rail access is negotiated directly between the rail infrastructure owner and access seeker. However, where agreement cannot be reached, IPART will act as an arbitrator and Part 4A of the *Independent Priding and Regulatory Tribunal Act 1992* will apply to govern the arbitration.[14]

We note Origin Energy's concerns about the availability and allocation of RailCorp train paths between users. We also note that Origin Energy is currently in discussions with RailCorp about these issues. IPART does not have a direct role in permitting access to the network or approving capacity upgrades that may be required to facilitate access. These are matters for the rail infrastructure owner to negotiate with access seekers. We note that under the Undertaking, new investment decisions in the HVCN may be made by the rail infrastructure

10 Correct Planning and Consultation for Mayfield Group submission, 18 May 2014, p 1.
11 Mr R. Banyard submission, 20 May 2014, p 1.
12 http://www.epa.nsw.gov.au/whoweare/whatwedo.htm, accessed 4 July 2014.
13 Origin Energy submission, 5 June 2014, p 2.
14 NSW Rail Access Undertaking, Section 6.

owner to facilitate access following consultation with stakeholders.[15] Following consultation with access seekers new investment required for a stand-alone coal only network can be added to the regulatory asset base and a return on and of capital is included in the ceiling test.

The Correct Planning and Consultation for Mayfield Group and Mr Banyard, an individual, raised concerns about coal trains impeding the path of or being favoured over passenger trains.[16]

We note that under the *Transport Administration Act 1988*, the rail infrastructure owner must apply passenger priority principles in NSW, such that passenger trains have reasonable priority and certainty of access over coal, freight and other trains.[17]

2.1.5 IPART determines the rate of return and depreciation for the rail infrastructure owner

Every five years, IPART is required to review the rate of return and depreciation to be applied when rolling forward the asset base and calculating whether access revenue has exceeded the ceiling test.

Schedule 3, clause 2.1 of the Undertaking states that:

> Rate of return means a rate of return in percentage terms approved by IPART for a period of five years to be applied to the average of the Opening and Closing Regulatory Asset Base.

Schedule 3, clause 3.2(c)(i) and (ii) of the Undertaking state that:

(i) depreciation is to be calculated at the beginning of each financial year using a straight-line methodology and the estimate of the remaining useful life of the assets

(ii) the useful life of a Sector or group of Sectors is to be determined by reference to the remaining mine life of the Hunter Valley coal mines utilising that Sector or those Sectors.

Mr Banyard, an individual, expressed concern that these charges are determined based on the coal network and not the rail sectors in question.[18]

The Undertaking is prescriptive about how depreciation should be determined. As such, IPART is limited to considering the remaining mine life of Hunter Valley coal mines utilising the sectors to determine the useful life of the sectors.

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15 NSW Rail Access Undertaking, Schedule 3, Section 3.3.

16 Correct Planning and Consultation for Mayfield Group submission, 18 May 2014, p 1; Mr R. Banyard submission, 20 May 2014, p 2.

17 NSW Government, *Transport Administration Act 1988*, Part 2, Section 5(2)(a).

18 Mr R. Banyard submission, 20 May 2014, p 2.

2.2 RailCorp's network covered by this review

This review applies only to the five sectors of rail track owned by RailCorp from Newstan Junction to Woodville Junction in the HVCN.

The Undertaking makes a distinction between the HVCN and other rail networks (non-HVCN) in NSW. The HVCN is subject to greater monitoring oversight as it is more likely that this network has monopoly power and could potentially over-recover costs.

The HVCN comprises 37 track sectors of which 32 are leased to the ARTC for 60 years from 5 September 2004.[19] The ARTC has a separate undertaking with the Australian Competition and Consumer Commission (ACCC) (Hunter Valley Access Undertaking 2011 (HVAU)) and so its sectors of rail track are no longer subject to the NSW Rail Access Undertaking.

RailCorp owns the remaining five sectors comprised of about 21 kilometres running between Newstan and Woodville Junction. They are used by passenger trains as well as coal and other freight trains. It is only the RailCorp-owned sectors of the HVCN that are subject to the NSW Rail Access Undertaking and hence, this review.

RailCorp's HVCN sectors are listed in Table 2.1 below.

Table 2.1 RailCorp Hunter Valley Coal Network sectors

Sector	Name	Kilometres
405	Newstan Jct to Cockle Creek	7.18
406	Cockle Creek to Sulphide Jct	3.15
490	Sulphide Jct to Adamstown	8.05
407	Adamstown to Broadmeadow (via Main)	1.60
497	Broadmeadow to Woodville Jct	0.85

Source: NSW Rail Access Undertaking.

[19] http://www.artc.com.au/Article/Detail.aspx?p=6&np=4&id=63, accessed 1 May 2014.

2.3 Our previous decisions on rate of return and remaining mine life

We set the initial estimate of the remaining mine life for all 37 sectors of the HVCN at 40 years from 1 July 1999, giving a terminal date of 2039. We made this decision with regard to:

- the estimated rail infrastructure asset life, which was 39.4 years[20]
- a balance between the views of stakeholders, which ranged from 30 to 50 years.[21]

In our subsequent five-yearly reviews of remaining mine life, we found that there was not sufficient evidence to warrant a revision of the remaining life of the sectors. As such, we did not revise the terminal date from 2039. In our last review in 2009, for all 37 sectors we set a remaining mine life of 30 years and used a real pre-tax WACC to determine a rate of return of 8.0%.[22]

2.4 Key issues for this review

Since our 2009 review, there have been a few changes to the HVCN operating environment and our practices, including the following:

- responsibility for the ARTC's HVCN sectors was transferred to the ACCC in 2011, following the signing of the HVAU
- TfNSW is currently reviewing the Undertaking
- our 2011 decision on the incorporation of company tax in pricing determinations
- our 2013 final decision on WACC methodology
- new mining prospects in the Gunnedah Basin.

2.4.1 Change in scope due to the Hunter Valley Access Undertaking 2011

In 2011, the HVAU was approved by the ACCC. The ARTC sectors of the HVCN are now regulated under the HVAU and not the NSW Undertaking. As such, our decisions only apply to the five sectors that are owned by RailCorp.

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20 IPART, *Aspects of the NSW Rail Access Regime – Final Report*, April 1999, p 44.
21 Ibid, p 45.
22 IPART, *New South Wales Rail Access Regime Undertaking – Review of the rate of return and remaining mine life from 1 July 2009 – Final Report and Decision*, August 2009, p 1.

This has implications for our decision on the remaining mine life. The Undertaking requires that the remaining mine life is determined by reference to the *Hunter Valley coal mines utilising that sector or those sectors.*[23] The mines that utilise the RailCorp-owned sectors are not necessarily the same mines that utilise all the HVCN sectors.

2.4.2 TfNSW review of the Undertaking

TfNSW is currently reviewing the Undertaking.[24] The review is to inform the Government on the form and scope of future rail access regulation applying to the rail networks that remain in the State's control - the Metropolitan Rail Network (MRN), the Country Regional Network (CRN) and the five sectors of the HVCN. The review was prompted by some significant changes within the NSW rail network, such as the ACCC taking over the regulation of access for the interstate network and sectors of the HVCN operated by the ARTC.

Under current arrangements, rail freight operators in NSW may have to negotiate access with multiple operators, under multiple different regulatory regimes. In its Issues Paper, TfNSW noted that network interface management is now a key challenge for operators and it was important for the future access regime to support the efficiency of the supply chains operating across these networks.[25] This is particularly apparent for the HVCN where there are two undertakings and two regulators.

In our draft report, we recommended that as part of its review of the Undertaking, TfNSW investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime.

This recommendation was supported by stakeholders. Origin Energy stated that it supported reducing red tape for rail access, but that this was contingent on any streamlining process having extensive and meaningful consultation with stakeholders to ensure that existing flexibility around coal path rights is not compromised.[26]

Asciano stated that it would support any move towards a single HVCN access regime and that the two access regimes currently regulating the HVCN created unnecessary duplication of regulatory effort and potential for interface problems between the two regimes.[27]

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23 NSW Rail Access Undertaking, Schedule 3, Section 3.2 (c)(ii).
24 http://www.transport.nsw.gov.au/freight/nsw-rail-access-regime, accessed 2 July 2014.
25 TfNSW, *Review of NSW Rail Access Regime - Issues Paper*, November 2012, p 5.
26 Origin Energy submission, 5 June 2014, p 2.
27 Asciano submission, 28 May 2014, p 1.

While ARTC did not explicitly state support for this recommendation, it also noted that it considered it important that there be a degree of consistency between regulatory outcomes across jurisdictions, particularly where users operate across more than one jurisdiction.[28]

Having multiple regulatory regimes and regulators for adjacent networks can add additional red tape for rail infrastructure owners and users and creates the potential for differing regulatory outcomes. We consider that while there may be some sector-specific differences between networks, the regulatory treatment of these networks should be as consistent as possible to reduce red tape.

We consider that this would be best addressed through TfNSW's current review of the Undertaking and recommend that as part of this review, TfNSW investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime.

Final recommendation

1 That as part of its review of the Undertaking, Transport for NSW (TfNSW) investigates options for reducing red tape for rail access, including the option of regulating all of the HVCN under one regulatory regime.

2.4.3 Our 2011 decision on the incorporation of company tax in pricing determinations

Our previous decision on the rate of return that applies to the HVCN was based on a real pre-tax WACC.

In 2011, IPART decided on an alternative approach that better estimates the tax liability for a regulated business.[29] This involves using a real post-tax WACC to estimate the appropriate return on capital and including tax as a separate operating cost category. In line with this decision, we propose to use a real post-tax WACC for this review.

For the purpose of demonstrating its compliance with the AVRFP and ceiling test for the 2014/15 financial year, RailCorp will be required to establish an initial tax asset base (TAB) and propose an annual tax allowance. This is discussed further in Chapter 3.

28 ARTC submission, 6 June 2014, p 1.

29 IPART, *The Incorporation of Company Tax in Pricing Determinations – Final Decision*, December 2011.

2.4.4 Our 2013 final decision on WACC methodology

In 2013, we revised our methodology for calculating a WACC for regulated businesses. We have used the methodology and standard parameter valuations set out in our December 2013 final report.[30] This is discussed further in Chapter 3.

2.4.5 New mining prospects in the Gunnedah Basin

At the time of our 2009 review, there were several prospective mines in the Gunnedah Basin region that were not yet operational. These included mines at Maules Creek, Caroona and Watermark.

Since then, some of these prospective mines have received governmental approval and are likely to commence operations in the next five years. In particular, Maules Creek was fully approved in July 2013. It is expected to rail approximately 12 mega tonnes of coal per annum (Mtpa) and commence operations in 2015.[31]

3 Determining a rate of return for the Hunter Valley Coal Network rail sectors

The WACC aims to provide the operator of regulated assets with a rate of return equivalent to that required by the market to invest in those assets.

In previous decisions made under the Undertaking, we used a real pre-tax WACC to determine an appropriate rate of return. Since our 2009 review, we have revised our approach to calculating a WACC for regulated assets, including adopting a real post-tax WACC framework and adopting standard parameter valuations.

This chapter outlines our final decision and explains how we have applied our methodology to calculate the WACC.

3.1 Final decision on rate of return

Final decision

1 The rate of return that should apply from 1 July 2014 is 5.9% per annum on a real post-tax basis.

30 IPART, *Review of WACC Methodology – Final Report*, December 2013.

31 http://www.whitehavencoal.com.au/operations/maules_creek.cfm, accessed 23 April 2014.

This is the mid-point of the upper and lower bounds of the range calculated using long-term averages and current market data.[32] This is slightly lower than the rate of return determined in our draft decision, because of slight changes in market parameters between the draft and final decisions.

Table 3.1 shows the parameters in our WACC final decision.

Table 3.1 Final decision on WACC

Parameter	Current market data	Long-term averages	Final WACC range
Nominal risk-free rate	3.7%	5.0%	
Inflation	2.7%	2.9%	
Debt margin	2.3%	2.9%	
Market risk premium	7.6-8.7%	5.5-6.5%	
Debt funding	40-50%	40-50%	
Equity beta	0.7-1.0	0.7-1.0	
Cost of equity (real post-tax)	6.1-9.4%	5.8-8.4%	
Cost of debt (real pre-tax)	3.2%	4.9%	
Real post-tax WACC	**4.7-6.9%**	**5.3-7.0%**	**5.7-6.0% with a mid-point of 5.9%**
Real pre-tax WACC equivalent	5.9-9.0%	6.6-8.9%	7.5%

Source: Thomson Reuters, Bloomberg and RBA data at 30 June 2014.

In making our final decision, we adopted the following industry-specific parameters:

- A gearing level of 40% to 50% in view of current market evidence that shows that the average gearing level of US railroads has declined since 2009 and our estimate of Aurizon Network's current gearing level.
  - This is lower than the gearing level of 50% to 60% that we applied in our 2009 review.[33]
- An equity beta of 0.7 to 1.0, which is consistent with the equity beta we adopted in our 2009 review.[34]

In its submission, the ARTC noted that an equivalent rate of return in 2014 to the rate of return that it negotiated with industry in 2011 would be broadly consistent with that determined in our draft report. However, ARTC noted that it would expect a higher outcome reflecting additional risks faced by ARTC in the Hunter Valley compared to those faced by Railcorp.[35] No other submissions commented on the rate of return.

[32] We chose the mid-point of the range, because the uncertainty index is within 1 standard deviation from the long-term average of zero.

[33] IPART, *New South Wales Rail Access Regime Undertaking – Review of the rate of return and remaining mine life from 1 July 2009 – Final Report and Decision*, August 2009, p 6.

[34] Ibid.

[35] ARTC submission, 6 June 2014, p 4.

3.2 Our approach to calculating the rate of return

3.2.1 Adopting a real post-tax WACC

We have calculated the rate of return based on a real post-tax WACC in line with our standard practice. Applying a real post-tax WACC does not require any adjustment to RailCorp's RAB. However, for future annual compliance audits, RailCorp will need to include an estimate of tax liability in its operating costs. To do this, RailCorp will need to establish and maintain a TAB. Box 3.1 explains how this is generally done under our framework.

Box 3.1 Establishing a tax asset base and calculating a tax allowance

In accordance with our move to a post-tax financial model, RailCorp will need to include tax expenses in its operating costs as part of its annual report to IPART on compliance with the Undertaking.

Currently, RailCorp does not incur any tax liability. As such, RailCorp's tax expenses will need to be estimated on the basis of a similar privately-owned company. RailCorp will need to establish an initial TAB and estimate notional tax expenses, based on its annual revenue and costs.

The TAB is updated each year by adding nominal capital expenditure and deducting tax depreciation (based on the same depreciations rates as allowed for the RAB) and nominal asset disposals.

The tax expense is calculated as follows, in nominal terms:

- Step 1: Calculate taxable income =
  - total regulatory revenue (operating costs + return on assets + regulatory depreciation + any capital contributions if received by a company)
  - less deductions (operating costs + tax depreciation + notional interest expense (where notional interest expense = RAB x debt gearing ratio x notional nominal cost of debt)).
- Step 2: Calculate tax payable =
  - taxable income x statutory rate adjusted for the value of franking credits (gamma).
- where:
  - no capital contributions are included (ie, they have a value of zero)
  - the tax deductible interest is calculated from the nominal cost of debt applied to an amount of debt that reflects the level of gearing used in the WACC, multiplied by the nominal RAB
  - the value of franking credits (gamma) is set at 0.25.

Note: An excel file showing an example of the calculation of a tax allowance is also available on our website.

3.2.2 Adopting a standard methodology for WACC parameter valuations

In 2013, we revised our methodology for calculating a WACC for regulated businesses. Our new process is summarised in Box 3.2. Further detail about our WACC methodology is available on our website.[36]

Box 3.2 IPART's standard WACC approach for regulated businesses

Our December 2013 decision sets out the approach that we use to determine the cost of debt, cost of equity, inflation and resulting WACC from a feasible range. To determine the WACC, we:

- Estimate a feasible WACC range and mid-point based on:
  - the mid-point of the range using long-term averages
  - the mid-point of the range using current market data.
- Choose a WACC point estimate within the WACC range based on our WACC decision rule.
- Specify our point estimates for the cost of debt and the cost of equity and the evidence we considered in choosing the WACC point estimate.

The WACC decision rule takes account of the level of economic uncertainty when choosing a point estimate of the WACC. First, we construct a monthly uncertainty index using the S&P/ASX 200 VIX Index, the dispersion in analysts' forecasts for companies in the S&P/ASX 200, credit spreads and Bills-OIS spreads from July 2001. Second, we apply the following WACC decision rule:

- If the uncertainty index is within or at 1 standard deviation from the long-term average of 0, we will select the midpoint WACC.
- If the uncertainty index is more than 1 standard deviation from the long-term average of 0, we will consider moving away from the mid-point WACC. In deciding whether and by how much the WACC point estimate should deviate from the mid-point, we will have regard to the value of the uncertainty index and additional financial market information, including debt and equity transaction data, interest rate swap curves, equity analyst reports and independent expert reports.

We have applied the new WACC methodology and estimated market-based parameters as set out in our December 2013 WACC final report. We have conducted an industry-specific analysis to estimate an appropriate equity beta and gearing level for RailCorp's HVCN. This is discussed in Section 3.3.

36 IPART, *Review of WACC Methodology – Final Report*, December 2013.

For the cost of debt estimate, we indicated in our December 2013 WACC final report that we would consider using the RBA corporate debt margin series once it became available. The RBA series has now become available and after further consultation with stakeholders on this proposed change, we released a Fact Sheet announcing that we would implement the new approach based on the RBA series from 30 April 2014.[37]

3.3 Estimating industry-specific parameters

Our WACC approach allows us to determine the appropriate values of certain industry-specific parameters as part of our individual review processes. These include the equity beta and gearing level.

It is difficult to find exact comparators to estimate the efficient gearing level or equity betas for non-traded regulated monopoly businesses. There are often material differences in the regulatory framework and the price structure. In particular, it is difficult to isolate the risks relating to a network business segment (for example, electricity distribution or below-rail networks) from a vertically-integrated publicly traded utility.

In making our final decision, we had regard to a combination of current market evidence, the systematic risk of other industries and recent regulatory decisions.

3.3.1 Equity beta

The systematic risk of an asset is measured by its 'beta' factor. The beta reflects the extent to which future returns are expected to co-vary with the overall market.

Current market evidence

RailCorp's HVCN has a RAB and is provided with a rate of return on these assets that is updated every five years in line with current market evidence. This limits its exposure to cost and interest rate risks. Empirical evidence suggests that regulation tends to reduce systematic risks by buffering cash flows.

This suggests that RailCorp's HVCN's systematic risk may be similar to that of other regulated infrastructure network businesses, such as energy and water utilities. These businesses are also typically regulated and their costs are reviewed at periodic intervals.

[37] http://www.ipart.nsw.gov.au/Home/Industries/Research/Reviews/WACC/A_new_approach_to_estimating_the_cost_of_debt_Use_of_the_RBA's_corporate_credit_spreads/01_May_2014_-_Fact_Sheet/Fact_Sheet_-_IPARTs_New_Approach_to_Estimating_the_Cost_of_Debt_-_April_2014.

We reviewed comparable infrastructure networks (such as railroads, toll roads and energy and water utilities). These sectors share the characteristics of RailCorp's HVCN in that they are either transport-related infrastructures and/or infrastructures subject to similar forms of regulation.

Table 3.2 presents the equity and asset betas and gearing levels of these industries.

Table 3.2 Asset betas and equity betas of reference industries

Industry	Industry average gearing	Equity beta	Asset beta[a]
Railroads (US, CAN, AU)	17%	1.12	0.93
Toll roads (global)	40%	0.81	0.48
Energy utilities (US, UK, AU, NZ)	40%	0.75	0.45
Water utilities (UK, US, NZ)	39%	0.73	0.45

a The asset beta values are calculated using practitioner formula: Be=Ba*(1+D/E).

Source: Bloomberg, IPART analysis.

As shown in Table 3.2, railroads have a relatively low gearing ratio and high equity beta. The equity beta is high because the regulation of the US Class 1 railroads is non-constraining and a substantial portion of their revenues is subject to competition from other railroads and other forms of transport. As a result, stranding risk is higher and revenues are sensitive to the economic cycle.

For this reason, we consider that regulated energy and water utilities provide a more relevant benchmark for assessing the RailCorp HVCN's systematic risks. Current market evidence suggests that listed energy and water utilities have asset betas of around 0.45.

Recent regulatory decisions

In 2010, the Queensland Competition Authority (QCA) applied an asset beta of 0.45 for a comparable rail infrastructure business – the QR Network. This translates to an equity beta of 0.80 (see Table 3.3).

Table 3.3 Recent Australian regulatory decisions on equity beta for rail infrastructure

Regulator	Year	Rail infrastructure	Asset beta	Gearing	Equity beta
QCA	2010	QR Network	0.45	55.0%	0.80

Source: QCA, *Draft Decision – QR Network's 2010 DAU – Tariffs and Schedule F*, June 2010, p 56.

Conclusion on equity beta

The equity beta range of 0.70 to 1.0 that we adopted in 2004 and 2009 equates to an asset beta range of 0.42 – 0.50.[38] While it is not consistent with the asset betas of railroads, it is consistent with current market evidence on the asset betas of comparable regulated energy and water networks in Table 3.2. As explained above, we consider that US railroads networks are significantly more risky than RailCorp's HVCN. We also note that an asset beta of 0.45 determined by the QCA for QR Network also falls into this range.

Therefore, we conclude that the equity beta for RailCorp's HVCN should be maintained at 0.7 to 1.0.

3.3.2 Gearing level (debt to total asset ratio)

Gearing represents the amount of debt capital in a firm's capital structure. Where the business risk of a firm is high, it is expected that the firm will carry less debt and vice versa.

Current market evidence

It is common regulatory practice to benchmark a regulated business's capital structure with reference to gearing level of businesses operating in the same or similar industries rather than using the regulated firm's actual capital structure. In doing so, the regulator aims to estimate the efficient benchmark industry gearing level.

RailCorp's HVCN is a regulated below-rail infrastructure network to facilitate the transport of coal. A few listed US railroad companies share some of the characteristics of RailCorp's HVCN. Table 3.4 shows the current gearing levels of these businesses and how these have changed since 2009. On average, the gearing levels of the US railroads have declined over recent years from 38% to 20% since the peak of the Global Financial Crisis.

[38] Based on a gearing level of 40% to 50%.

Table 3.4 Estimated gearing levels of US listed railroad companies

Reference companies	Gearing level 2009 (%)	Gearing level 2013 (%)
Burlington	30%	Company delisted in 2010
CSX	34%	25%
Genesee & Wyoming	41%	27%
Kansas Southern City	62%	11%
Norfolk South	32%	25%
Union Pacific	27%	11%
Average US railroads	**38%**	**20%**

Note: The gearing levels for 2009 and 2013 are both calculated using the market value of equity. In our 2009 decision, we calculated gearing levels using the book value of equity.

Source: Thomson Reuters Datastream and IPART analysis.

The regulation of US railroads is light-handed and non-constraining. Notably, part of their revenue is subject to competition from other railroads or other forms of transport. In relative terms, stranding risk of the US railroads is higher and their revenues are more sensitive to the economic cycle. By comparison, RailCorp's HVCN is regulated, which buffers the earnings of the business.

Since our 2009 review, there has been one Australian rail freight company that has been publicly listed on the Australian Stock Exchange. Aurizon Holdings provides coal, bulk and general freight haulage services on the Central Queensland Coal Network (CQCN) (among others) and specialised track maintenance and workshop support functions. Its gearing level is about 25%.[39] Aurizon Network, a subsidiary of Aurizon Holdings, is responsible for providing, maintaining and managing access to the rail network including the CQCN. Aurizon Network is regulated by the QCA in a manner similar to RailCorp. We have estimated Aurizon Network's current gearing level to be about 32%.[40]

Other things being equal, a business that faces a higher level of business risk is expected to borrow less money than a business facing a lower level of business risk. A coal infrastructure network is expected to have more stable cash flows than a rail network that carries general freight facing more competition from other forms of transport. As such, a below-rail service provider could sustain a higher gearing level.

Recent regulatory decisions

In 2010, the QCA applied a gearing level of 55% for QR Network, the predecessor of Aurizon Network (Table 3.5).

39 Thomson Reuters Eikon as of 28 April 2014.

40 IPART calculations as at 29 April 2014.

Table 3.5 Recent Australian regulatory decisions on gearing for rail infrastructure

Regulator	Year	Regulated infrastructure	Gearing (%)
QCA	2010	QR Network	55%

Source: QCA, *Draft Decision – QR Network's 2010 DAU – Tariffs and Schedule F*, June 2010, p 32.

In 2010, QR Network was involved in coal haulage and as such, faced systematic risks comparable to RailCorp's HVCN. At present, QCA is undertaking a review of Aurizon Network's 2013 draft rail access undertaking, in which Aurizon Network proposed a gearing level of 55%.

Conclusion on gearing level

We conclude that the gearing level for RailCorp's HVCN should be lowered to 40% to 50% (compared to our 2009 decision of 50% to 60%). This is primarily based on current market evidence that shows that the average gearing level of US railroads has declined since 2009 and our estimate of Aurizon Network's current gearing level.[41]

4 Remaining mine life of Hunter Valley mines utilising RailCorp's network

The Undertaking requires that the useful life of relevant rail infrastructure is determined by the remaining mine life of the Hunter Valley coal mines utilising those sectors. It is used as a proxy to calculate depreciation to determine compliance with the ceiling test and roll forward the RAB.

This chapter explains our final decision on the remaining mine life of the relevant mines utilising the RailCorp HVCN sectors. It explains how we determined the relevant mines and calculated their remaining lives and what this means for the terminal date. It also explains how the remaining mine life should be used to calculate depreciation via the straight-line method.

4.1 Final decision on remaining mine life

Final decision

2 The remaining mine life from 1 July 2014 should be increased to 30 years, resulting in a terminal date of 2044.

41 Aurizon Network's actual gearing level was not available in 2009, so we were not able to compare the same trend for Aurizon Network between 2009 and 2014.

4.2 Methodology for calculating depreciation

We engaged Sapere to review the methodology for calculating remaining mine life and provide advice on the appropriate remaining mine life. Sapere's final report can be found on our website.[42]

Sapere reviewed three alternative methodologies for calculating depreciation:

1. Weighted average mine life (WAL) with straight-line depreciation.
2. Longest-lived substantial mine life (LLSM) with straight-line depreciation.
3. Unit of production (UOP) with depreciation value depending on mine output, rather than time.

The WAL method identifies a group of mines that utilise a particular sector or group of sectors. For each of these mines, the remaining reserves and average yearly output are determined. The expected life of the mine is then the reserve quantity divided by the average annual output. The useful life of the sectors is the average of the expected lives of the mines, weighted by mine reserves.

The LLSM method sets a minimum 'threshold' level of substantial output on sector or group of sectors and identifies the mines using those sectors that have that level of output. A sample of mines with the longest lives is identified (using remaining reserves divided by annual output where available) and the median of the sample is selected to account for uncertainty in reserves and expected annual output.

The unit of production method sets depreciation charges that are constant per tonne of coal. The opening regulatory asset value is divided by the total tonnes of reserves and that is applied to every tonne of coal mined.

Sapere concluded that the unit of production method was the most affordable, least distorting and created the least risk of asset stranding over the rail infrastructure's life. This is because it tailors the depreciation charge to be highest in years where there is higher ability to pay, which minimises the risk of premature line closure and stranding of coal reserves as coal reserves dwindle towards the end of a mine's life. However, this approach is not consistent with the Undertaking, which requires depreciation to be levied on a straight-line basis.

[42] http://www.ipart.nsw.gov.au/Home/Industries/Transport/Reviews/Rail_Access/Review_of_rate_of_return_and_remaining_mine_life_from_1_July_2014/08_May_2014_-_Consultant_Report_-Sapere_Research_Group/Consultant_Report_-_Sapere_Research_Group_-_NSW_Rail_Access_Undertaking_-_Review_of_the_rate_of_return_and_remaining_mine_life_-_May_2014

Given this, Sapere recommended using the LLSM method over the WAL for the following reasons:

- WAL depreciation is volatile, leading to artificial jumps in access prices whenever mines close
- WAL tends to bring forward depreciation charges, to the benefit of the track owner but the detriment of access seekers
- compared to LLSM, WAL increases the risk of stranding coal mines, because it leads to higher depreciation charges per tonne of coal as overall reserves begin to run out
- the decision to mothball a coal railway line would not be taken as long as there is significant coal tonnage to be carried.

Sapere noted that while a similar pattern of increasing depreciation charges per tonne of coal would also be observed under a LLSM approach, the WAL-based depreciation charges would be higher than LLSM charges for the entire original WAL[43] so stranding risk would be higher.

In its submission, ARTC noted that under the HVAU the estimation of remaining mine life is to have regard to average mine production levels anticipated during the term, which (amongst other factors) contributed to a terminal year of 2032 in 2011.[44] The ARTC stated that the LLSM approach is always likely to lead to a higher remaining mine life estimate than the WAL approach, possibly at the upper end of reasonable remaining mine life expectations. This will result in increased risk of stranding investment costs to the infrastructure owner which, unless compensated by other means, will reduce investment incentives.[45]

We considered proposals for using the WAL methodology to determine the remaining life of the relevant rail assets in our 2004[46] and 2009[47] reviews. However, we did not adopt the WAL as there was no consensus reached among stakeholders on whether the WAL approach, or an alternative methodology, was a superior method for determining remaining mine life.[48] Further, there was no evidence to suggest that a material change had occurred in the expected remaining life of mines utilising the relevant sectors that would result in a shorter terminal date (as would be the case under the WAL approach).[49]

43 That is, the initial WAL estimate before any adjustments are made in the event of mine closures.
44 ARTC submission, 6 June 2014, pp 5-6.
45 Ibid, p 7.
46 IPART, *Report on the Determination of Remaining Mine Life and Rate of Return – From 1 July 2004*, May 2005, pp 5-9.
47 IPART, Op. cit., August 2009, p 47.
48 Ibid, p 51.
49 IPART, Op. cit., May 2005, p 9.

We consider that the LLSM approach is a better proxy for approximating the remaining useful life of the RailCorp HVCN rail assets. It reflects the actual decision a rail owner would make about keeping a rail line operational. That is, a rail line would remain in operation while there is at least one substantial mine still utilising that line. In practice, the expected useful life of the rail line would not decrease if a shorter-lived mine ceased production.

While we acknowledge the asset stranding risks that exist under both the LLSM and WAL approach, we consider that the LLSM approach provides a better balance of these risks between coal mine and rail infrastructure owners.

Compared to the LLSM, the WAL approach leads to higher depreciation charges being passed through to mine owners, because depreciation is brought forward to be recovered over a shorter time frame. As coal reserves dwindle, this may lead to premature stranding of coal reserves if mine owners determine that it is uneconomic to continue to transport coal on the line.

The WAL approach also results in more unpredictable depreciation charges over time than the LLSM approach if it is revised whenever a smaller mine ceases production. For example, over the past five years, a WAL applied to the RailCorp sectors would have fluctuated with the recommencement and cessation of coal haulage from Newstan Colliery, Awaba and Westside mines.[50]

On balance, we consider that the LLSM provides a more realistic approximation of the expected remaining life of the rail assets and appropriate balance of the investment risks between the rail infrastructure owner and mine owners.

4.3 The mines that utilise the RailCorp network

The only two coal mines located on the RailCorp sectors are at Newstan and Teralba. Since 2008, Newstan Colliery has been on 'care and maintenance',[51] but produced a small amount of coal (55,000 tonnes) in 2011.[52] Since 2001, the Teralba Colliery has been closed.

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50 www.centennialcoal.com.au/News/Latest-News/Media-Statement-Newstan-110714.aspx, www.centennialcoal.com.au/Operations/OperationsList/Awaba.aspx, http://sustainability.xstratacoal.com/EN/CaseStudies/Pages/westside-mine-closure.aspx (accessed 14 July 2014)

51 Care and maintenance is a term used in the mining industry to describe processes and conditions on a closed mine site where there is potential to recommence operations at a later date. During a care and maintenance phase, production is stopped but the site is managed to ensure it remains in a safe and stable condition.

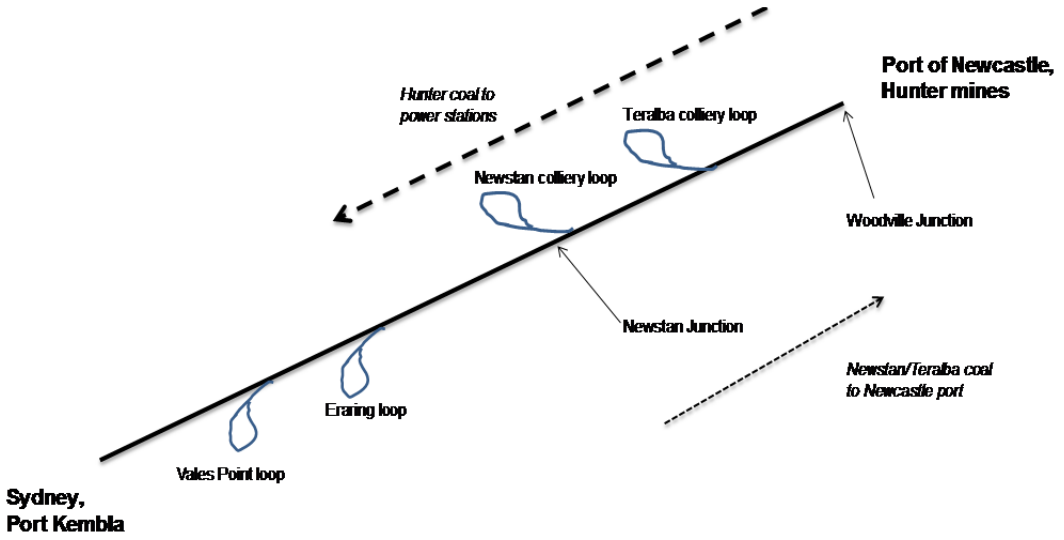
52 http://www.centennialcoal.com.au/Operations/OperationsList/Newstan.aspx, accessed 1 May 2014.

In our draft report, we stated that coal traffic from other mines is currently transported along the line:

- northbound from the Newstan colliery to Newcastle Port
- southbound from the Hunter Valley to the power stations at Vales Point and Eraring
- occasionally southbound between the Hunter Valley and Port Kembla.

Figure 4.1 provides a diagram of the RailCorp HVCN showing the approximate location of mines and power stations.

Figure 4.1 Diagram of RailCorp HVCN showing mines and power stations



Source: Sapere, *IPART 2014 review of remaining mine life under the NSW Rail Access Undertaking* – Final report, 3 July 2014, p 8.

In its final report, Sapere concluded that if the Newstan mine was to cease production, the line would still be used to supply coal to the power stations from other mines in the Hunter Valley. Sapere concluded that any mine in the Hunter Valley with sufficient output could use the sectors to supply coal to the power stations. If one mine ceased production, another would take over for as long as the power stations continued to operate.

In its submission, ARTC suggested that over the past five years or so, export traffic from the southern mines to Newcastle has increased significantly, whilst domestic movements from Hunter Valley mines to the southern power stations and Port Kembla have declined and that the substantial majority of coal utilising the relevant sector is now export coal to Newcastle.[53] ARTC noted that over the past three to four years, there have been no significant coal domestic movements from mines in the Hunter Valley to Eraring or Vales Point, although there were some smaller movements south to Port Kembla.[54]

[53] ARTC submission, 6 June 2014, p 8.
[54] Ibid, p 9.

Following our draft report, we sought additional information from stakeholders about the current and expected use of the line to transport coal in the foreseeable future. Confidential information provided by stakeholders confirmed that there are currently equal, but relatively small flows of coal traffic both southbound and northbound.

Eraring Power Station receives coal from the south, north and adjacent mines, but not currently via RailCorp's HVCN sectors. However, any source of coal is substitutable and only limited by the availability and economics of transporting it from mines. In addition, recent changes in the coal market mean that power stations tend to purchase more 'spot coal' – that is, single-shipment bundles of coal from a mine outside its regular contract arrangements.[55]

We note that Origin Energy (owner and operator of Eraring Power Station) has recently invested around $1 million installing a new wagon unloading mechanism quick-drop system and is upgrading track to 30 tonne axle load capacity to support standard Hunter Valley trains to Eraring Power Station. This investment will enable Eraring Power Station to receive regular coal shipments from the Hunter Valley within the next five years.[56] Coal from the Hunter Valley mines would be transported via the RailCorp HVCN line.

Given the volumes of coal required to supply the power stations (discussed further in section 4.3.2), we conclude that the primary use of this line in future will be to supply coal to the power stations, particularly Eraring Power Station.

4.3.1 Current utilisation versus expected utilisation of the line

In its submission, ARTC stated that utilisation at the time of estimation or, at best, utilisation over the following five-year period would be more relevant to the current remaining mine life estimation, where any change in future utilisation would be dealt with at a subsequent estimate.[57]

We consider that the *mines utilising that sector or those sectors*, as required by the Undertaking, need not necessarily be located along the sectors. They may include any Hunter Valley mine with the production capacity to supply the power stations located south of the sectors, whether it is currently supplying, or could potentially supply, the power station in the foreseeable future. While coal mining and transportation that is likely to occur in the following five-year period are most relevant to our review, we consider that information about future coal mining and transportation activities, where it is known, is also relevant. To ignore such information may lead to sizeable changes in remaining mine life estimates at each five-yearly review, rather than small adjustments.

55 Discussions between IPART and stakeholders.
56 Ibid.
57 ARTC submission, 6 June 2014, p 10.

4.3.2 Minimum tonnage threshold

Sapere concluded that the coal consumption of the Vales Point and Eraring power stations varies from year to year, but is likely to exceed four million tonnes of coal per annum in a typical year.[58] This was selected as the minimum threshold in the LLSM calculation.

Eraring Power Station receives around five million tonnes of coal per annum from various sources.[59]

4.4 Identifying the longest-lived mines that utilise the RailCorp network

Sapere identified a sample of mines with annual production above the minimum threshold that could use the sectors based on information contained in the NSW 2013 Coal Industry Profile[60] and a company website. The marketable coal reserves, production levels and implied mine lives of these mines are illustrated in Table 4.1.

58 Sapere, *IPART 2014 review of remaining mine life under the NSW Rail Access Undertaking – Final report,* 3 July 2014, p 15.

59 Discussions between IPART and Origin Energy.

60 NSW Department of Trade & Investment, *2013 NSW Coal Industry Profile*, 2013.

Table 4.1 Longest-lived substantial mines in the Hunter Valley Coal Network

Name	Production (Mt)	Marketable coal reserves (Mt) at 30 June 2011	Reserves / production (Mt)[a]	Implied end year	Remaining mine life at 30 June 2014 (years)
Bengalla OC	5.7	131.8	23.2	2034	20
Bulga OC / Blakefield South UG	10.1	250.8	25.0	2036	22
Wambo UG and OC	5.7	150.0	26.4	2037	23
Wilpinjong OC	9.5	251.0	26.5	2038	24
Hunter Valley Operations OC	11.6	330.2	28.4	2039	25
Moolarben OC	12.8	376.4	29.4[b]	2040	26
Mount Thorley / Warkworth OC	9.3	302.0	32.3	2043	29
Maules Creek	12.4	n/a	30.0[b]	2044	30
Ulan UG	4.7	177.7	37.9	2049	35
Mt Arthur OC	20.0	936.0	46.8[b]	2058	44

a Calculated as reserve divided by maximum annual production between 2008 and 2011 unless otherwise specified.
b Calculated as measured resources divided by production capacity.
Note: Data obtained from NSW Coal Industry Profile 2013 for all mines except Maules Creek, which was obtained from the Whitehaven coal website.
Source: Sapere, *IPART 2014 review of remaining mine life under the NSW Rail Access Undertaking – Final Report*, 3 July 2014, p 18.

Sapere noted that uncertainty over the life for a single mine is very high, because small changes to the forecast average production could drastically alter the mine life estimate. This uncertainty can be reduced by considering data for several mines and taking a median. Sapere selected a sub-set of the five longest-lived mines in the sample and recommended a median terminal date of 2044. This equates to a remaining life of 30 years from 1 July 2014.[61]

ARTC raised several concerns about Sapere's methodology for estimating the remaining mine life including:

- the adoption of historical annual production estimates from 2008-2011[62]
- the use of measured resources rather than marketable reserves to estimate life of mines for which information about marketable reserves is not available (in particular, Maules Creek and Mount Arthur)[63]
- limiting the sample on which the median estimate is based to the top five LLSMs.[64]

61 Sapere, Op. cit., p 18.
62 ARTC submission, 6 June 2014, p 10.
63 Ibid, p 11.
64 Ibid, p 7.

4.4.1 Use of historical production estimates

ARTC stated that Sapere's use of historical annual production estimates do not take into account recent investment in coal chain infrastructure that has increased coal chain capacity significantly from those levels in 2008-2011.[65]

Sapere noted that the information from the NSW Coal Industry Profile 2013, which includes data on actual mine production, is currently the best information available.

Sapere noted that much of the forecast growth in general output comes from new mines. Some of these mines may start and finish before the LLSM has ceased production. That type of growth does not affect the LLSM life estimate unless the LLSM increases production rates in response to the capacity signal.

Sapere also noted that production forecasts are speculative and subject to change. For example, the ARTC's coal production forecasts that were used in the development of its HVAU have since been revised downwards substantially in its new 2014-2023 Hunter Valley Corridor Capacity Strategy Consultation Draft.

As part of our review we sought information on mine production and capacity from various sources and concluded that the best available and most reliable information source was the 2013 NSW Coal Industry Profile. While we acknowledge that there may have been commercial and operational improvements since 2011 that have increased coal chain capacity in the HVCN overall, it is uncertain what impact this will have on the expected life of the LLSM.

We consider that our final decision on remaining mine life takes into account this uncertainty by using an on balance measure of the median of the five LLSMs.

4.4.2 Use of measured resources rather than marketable reserves where information is not available

ARTC stated that the use of resources rather than marketable reserves creates further uncertainty in relation to the resulting remaining mine life estimate. Measured resources are required to undergo assessment in relation to a range of factors prior to being considered a coal reserve. As such, it is likely that only a fraction of measured resources will ultimately become classified as a marketable reserve and then be transported on the rail network.[66]

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65 Ibid, pp 10-11.
66 Ibid, pp 11-12.

Sapere acknowledged that measured resources may overstate the reserves of a mine, but noted that this does not necessarily overstate the estimate of mine life, because saleable production is also potentially overstated. Production capacity also overstates actual annual production, because it includes all run of mine production, some of which will not be saleable. In addition, mines always produce at below capacity, because of interruptions, stoppages and maintenance requirements. The ratio of two potentially overstated measures may result in either an overstated or understated estimate.[67]

Sapere noted that its estimates are the best available at the time and, in the case of Maules Creek, are supported by the mine owner's own estimates of remaining mine life.[68]

We agree with ARTC that there is uncertainty in estimating the remaining mine life. However, we conclude that our final decision, which is based on using the median of the top five longest lived substantial mines as recommended by Sapere, provides an on balance estimate using the best publicly available information on mine production, resources and reserves.

4.4.3 Use of a sub-set of five LLSMs

ARTC suggested that Sapere may have increased the possibility of over-estimation (of the remaining mine life) by arbitrarily limiting the sample of ten LLSMs to the top five LLSMs on which to base the remaining mine life estimate.[69]

Sapere noted in its final report that under the LLSM approach, the relevant measure of the remaining life of the rail asset is the longest-lived substantial mine. However, Sapere noted that there was some uncertainty over the individual lives for some mines. As such, rather than base its recommendation on the life of the LLSM, it used the median of the top five longest-lived mines to account for this uncertainty.[70]

We consider it inappropriate to base the remaining mine life on a single longest-lived mine, where its expected life is substantially longer than the next longest-lived mine(s). This could increase regulatory uncertainty from one review period to another, because of fluctuations in the level of reserves, forecast production and market conditions that influence the commerciality of the mine. Our analysis of the expected remaining mine life of the selected mines in Table 4.1 between 2009 and 2014 shows that many of the expected remaining mine lives have fluctuated considerably in the last five years – some have increased and

67 Sapere, Op. cit., p 22.
68 Ibid, p 21.
69 Ibid, p 19.
70 Sapere, Op. cit., pp 19 & 21.

some have decreased. Overall, the median remaining mine life has increased by around 12 years.[71]

The longest-lived mine in Table 4.1 is Mount Arthur, with an expected terminal date of 2058, which is considerably longer than the next longest-lived mine with a terminal date of 2049. The next few mines are clustered around similar terminal dates, which provide greater certainty that coal will continue to be produced until around those dates.

It is a matter of judgment as to what measure provides the best estimate of a terminal date. We consider that it is not appropriate to use an average, because it suffers from the same problems as the WAL approach to calculating remaining mine life. It is more appropriate to use the median of a cluster of similarly-lived mines.

Taking into account all submissions, Sapere's recommendations and our own analysis, we consider that using the median of the five LLSMs is an on balance approach to estimating a proxy for the remaining life of the rail assets.

4.4.4 Inclusion of prospective mines

At the time of our 2009 review, there were three prospective mines - Maules Creek, Caroona and Watermark – that had not received full government approvals or commenced operations. While we considered that, in principle, prospective mines should be included in the analysis; our 2009 final decision was an on balance estimate that did not take the commencement of these mines into account.

We consider that prospective mines should be taken into account where credible information about their reserves, production capacity and commencement date is available. As new mines commence operations or extensions to existing mines are granted, the remaining life of the longest-lived mine may increase. Failure to take this into account may lead to the rail operator over-recovering depreciation.

Since 2009, there have been some developments in the case of these mines. The Maules Creek mine was fully approved in July 2013 and is expected to begin operations in early 2015, generating 12Mtpa of coal over 30 years.[72] The commencement dates for the Watermark and Caroona projects are still subject to uncertainty over environmental approvals.

Given that Maules Creek is fully approved and anticipated to commence operations in 2015, we consider that it is likely that this mine could transport coal along the RailCorp HVCN sectors if required. However, there is still

71 Based on a comparison of data from the NSW Coal Industry Profile 2013 and data supplied in confidence by Booz Allen Hamilton at our 2009 review.

72 Sapere, Op. cit., p 7.

considerable uncertainty about the timing and level of operations for the Watermark and Caroona projects as they have not yet received all relevant government approvals. As such, we have not included them in our calculations this time. Should further information become available that provides us with greater certainty about their future operations, we would consider including them in our sample in future reviews.

ARTC stated that based on existing available information in relation to the commencement of the production of Maules Creek, it is reasonable to include this mine.[73]

4.5 Expected life of the power stations located on the RailCorp network

Having established that the primary use of the RailCorp sectors in the foreseeable future will be to supply coal to the two power stations located south of the line, we considered how long these power stations would be likely to operate. Closure of both power stations prior to cessation of coal mining in the Hunter Valley would provide an earlier constraint on the relevant life of the RailCorp HVCN sectors. This could lead to stranding of RailCorp's assets.

We sought advice from Frontier on the economic life of the Eraring and Vales Point power stations. Frontier's advice is available on our website.[74] The economic life is an important consideration in order to assess the period over which these power stations are likely to continue to operate.

We asked Frontier to consider whether the economic lives of either of these two power stations would be expected to extend beyond the current terminal date of 2039 and if so, if they would be expected to extend beyond the proposed terminal date of 2044.

Frontier provided advice based on its general experience modelling outcomes in the National Electricity Market. Its modelling takes into account a range of factors that are key determinants of the economic lives of power stations. It makes use of a wide range of cost and price forecasts sourced from Frontier's own analysis or those developed for AEMO's National Transmission Network Development Plan.

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73 ARTC submission, 6 June 2014, p 10.

74 http://www.ipart.nsw.gov.au/Home/Industries/Transport/Reviews/Rail_Access/Review_of_rate_of_return_and_remaining_mine_life_from_1_July_2014/08_May_2014_-_Consultant_Report_-Frontier_Economics/Consultant_Report_-_Frontier_Economics_-_advice_to_IPART_on_economic_lives_of_Eraring_Power_Station_and_Vales_Point_Power_Station

Frontier considered that there were three key determinants of economic life:

1. **Relative fuel costs:** higher costs of coal in NSW relative to coal in other states or relative to the price of gas will make the power stations less competitive.
2. **Relative carbon costs:** a higher carbon price makes the power stations less competitive.
3. **Investment in new power stations:** reductions in capital costs due to technological improvements or government-funded schemes, such as the Large-Scale Renewable Energy Target, makes it harder for these power stations to compete with newer and more efficient power stations.

Frontier considered that the greatest uncertainty faced by these power stations is the future level of carbon prices. It considered the future outlook of these power stations under three carbon price scenarios:

1. **International (low) carbon price:** Under current law, the carbon price faced by power stations is fixed, but will become a flexible price from 1 July 2015. Once this happens, the price is expected to converge to international carbon prices, which currently range from around $5/tonne to $30/tonne.
2. **No carbon price:** The Government has introduced legislation to repeal the carbon price from 1 July 2014. If this legislation passes and no other carbon pricing mechanism is introduced, this will make the economics of operating the power stations considerably better.
3. **High Carbon price:** If the carbon price was increased significantly, including scenarios with long-term prices in excess of $100/tonne, it would make the power stations much less economic to run.

Frontier concluded that with no carbon price or a price equivalent to the international carbon price - the economic life of Eraring Power Station would be most likely to extend beyond 2044, and the economic life of Vales Point Power Station may possibly extend beyond 2044.

Only under a carbon price significantly higher than the current international price, such as a price around $50/tonne to $100/tonne or higher, would the power stations be likely to become uneconomic prior to 2044. Frontier noted that for this to occur, there would most likely need to be strong international action on carbon emissions.

In its submission, Origin Energy noted that it was not approached to comment on Frontier Economics' analysis of the economic life of Eraring.[75] We held subsequent discussions with Origin Energy in confidence and have decided not to change our views from our draft report.

75 Origin Energy submission, 5 June 2014, p 2.

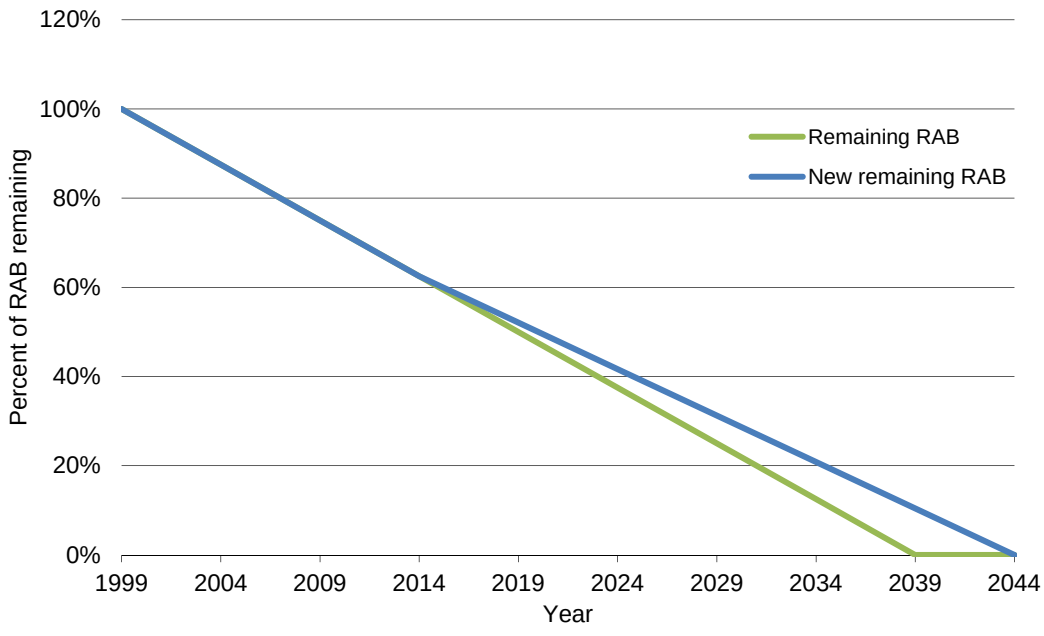
We also note that Eraring Power Station underwent a significant refurbishment in the last five years to extend its life and increase its capacity from 2,640 megawatts to 2,880 megawatts. The project had a total budget of around $659 million.[76]

Based on Frontier's advice on the most likely outlook on the economic life of the current Eraring and Vales Point power stations at this point in time, we consider that it is reasonable to assume that the life of the power stations will not provide an early constraint on the remaining life of the rail assets.

4.6 Implementation of the new terminal date

A new terminal date has some practical implications for RailCorp. The annual rate of depreciation will be lower, but will continue for longer. Figure 4.2 shows how the depreciation schedule should be modified in line with the straight-line method, in order to avoid an over- or under-recovery of depreciation.

Figure 4.2 New indicative depreciation schedule



Source: IPART calculations.

[76] NSW Auditor-General, *NSW Auditor-General's Report*, Volume Four, 2011, p 46.