

Queensland Competition Authority

Final decision

Aurizon Network's 2017 Electric Traction DAAU

August 2018

We wish to acknowledge the contribution of the following staff to this report:

Phoebe Bardsley, William Copeman, Ann Jones, Shaun McLagan, Manish Agarwal, George Passmore, Stephen Wisenthal

© Queensland Competition Authority 2018

The Queensland Competition Authority supports and encourages the dissemination and exchange of information. However, copyright protects this document.

The Queensland Competition Authority has no objection to this material being reproduced, made available online or electronically but only if it is recognised as the owner of the copyright and this material remains unaltered.

Contents

EXECUTIVE SUMMARY	II
THE ROLE OF THE QCA—TASK, TIMING AND CONTACTS	IV
1 INTRODUCTION	1
1.1 The electric access tariff (AT5)	1
1.2 Aurizon Network's 2017 AT5 DAAU	2
1.3 Assessment criteria	3
1.4 Regulatory process	3
1.5 Decision	5
2 IMPLICATIONS OF PRICING ARRANGEMENTS FOR ELECTRIC INFRASTRUCTURE	8
2.1 Implications of existing arrangements	8
2.2 QCA's view on pricing arrangements	13
3 TRANSFER OF VARIABLE CONNECTION CHARGES	16
3.1 Method for reallocating the cost base	16
3.2 QCA analysis and decision	18
3.3 Decision	20
4 ELECTRIC REVENUE ADJUSTMENT	21
4.1 The electric revenue adjustment mechanism	21
4.2 Utilisation measure and thresholds	24
4.3 Investment incentives	31
4.4 Other issues	34
4.5 Final decision	35
APPENDIX A: AMENDMENTS TO DAU	37
SUBMISSIONS AND REFERENCES	40
Submissions	40
References	41

EXECUTIVE SUMMARY

On 1 December 2017, Aurizon Network submitted an electric traction draft amending access undertaking (the 2017 AT5 DAAU), in which it proposed changes to arrangements for:

- pricing of electric traction services—transferring variable charges associated with electric connections from the electric infrastructure tariff (AT5) cost base to the electric energy charge (EC)
- recovery of electric system costs—allowing Aurizon Network to recover some electric infrastructure costs from diesel traction users when electric utilisation falls below specific levels.

The QCA has made this decision to refuse to approve the 2017 AT5 DAAU.

This decision report sets out:

- the reasons for the QCA refusing to approve the 2017 AT5 DAAU
- the way in which the QCA considers it appropriate to amend the draft access undertaking.

Aurizon Network considered it is subject to asset stranding risk as a result of the AT5 pricing framework

Aurizon Network was concerned about the possibility of users bypassing its electric infrastructure. It said that because of rising electricity prices electric traction has lost its historic cost advantage over diesel—and that the AT5 pricing framework acts to widen the cost differential, which further discourages operators from using or investing in electric locomotives. In Aurizon Network's view, this puts pressure on its ability to recover its electric traction costs and creates significant uncertainty over the future use of its electric network (through bypass and ultimately asset stranding).

Aurizon Network therefore proposed changes to arrangements for:

- pricing of electric traction services—by including a new term, the 'variable connection charge', in the list of items recovered via the EC
- recovery of electric system costs—by including an 'electric revenue adjustment' mechanism to the revenue cap that takes effect where actual AT5 revenue is lower than allowable AT5 revenue in a given year and electric utilisation in a system is less than a specified utilisation floor.

The AT5 pricing arrangements and the 'price spiral'

The QCA accepts that having AT5 as an average price may distort pricing signals—and that the current approach allows for the possibility of spiralling AT5 costs that could lead to infrastructure bypass and ultimately asset stranding, at least in theory.

However, the evidence suggests it is unlikely that any distortions from the existing AT5 approach will result in significant bypass or stranding in practice, especially in the short and medium term.

The degree of above-rail substitution between diesel and electric traction

The QCA considers the possibility of bypass (and consequent stranding) reflects traction choice in the above-rail markets.

An operator's choice between diesel and electric is complex, being driven by many factors. Expectations about movements in AT5 might play a role in decisions to retire and replace electric locomotives. However, traction choices are locked in by other operational considerations, such as the long lives of locomotives, the extended timelines for delivery and other costs specific to individual traction choices. This means that while it is possible for operators to switch between traction types, this is unlikely to happen often or happen very quickly.

Transferring variable connection charges from AT5 to EC

Aurizon Network proposed to transfer the variable charges associated with electric connections from the AT5 component to the EC, but did not intend to implement the proposed approach in the current undertaking period. While the QCA supports the proposed cost reallocation approach, Aurizon Network would need to implement the cost reallocation by updating the AT5 and EC tariff components in schedule F in order for the amendments to take effect.

Aurizon Network subsequently submitted proposed changes to AT5 prices to reflect the application of the cost reallocation. QCA considers that the approach taken to update these prices is appropriate to be adopted in any subsequent DAAU (in addition to other amendments discussed in Chapter 3).

Socialising AT5 under-recovery

Aurizon Network proposed an electric revenue adjustment mechanism to socialise AT5 costs across all users (diesel and electric) when electric utilisation falls below a 'floor' and there is an under-recovery of AT5 revenue from electric users.

While considering that the proposal has merits, the QCA has concerns around key implementation issues, which would need to be addressed in order for the DAAU to be approved.

The QCA considered that the thresholds as proposed by Aurizon Network were likely to be too high—where socialisation occurs in response to short-term falls in electric traction usage from current levels, rather than in response to ongoing year-on-year reductions, which would suggest bypass is occurring. Moreover, it was considered that setting the thresholds based on the share of coal hauled by electric locomotives compared to total coal haul could mean a new access seeker choosing diesel traction would trigger socialisation—with no change in the use of electric infrastructure.

It was also considered that a lower threshold and a more targeted measure would still provide some protection from an AT5 price spiral, but would also be more indicative of the genuine risk of asset bypass. This could be achieved by reducing the existing floor, or by constructing a different measure.

Aurizon Network proposed threshold levels of 98 per cent and 75 per cent for Goonyella and Blackwater respectively. In response to the QCA's draft decision, Aurizon Network then provided indicative lower values of 90 per cent and 70 per cent for Goonyella and Blackwater. These are still higher than threshold levels that the QCA considers to be justifiable given the information and evidence presented to date and the principles set out in Chapter 4.

Other matters that were considered, in investigating whether socialisation would promote efficient use of infrastructure and consistency with the pricing principles including:

- investment incentives
- demand deterioration spiral mitigation
- above-rail competition and favouring a related party.

Next steps

Amending an access undertaking is a voluntary process under the QCA Act. If Aurizon Network wishes to have a new or modified version of its AT5 2017 DAAU assessed, it needs to submit a revised proposal, which the QCA will consider on its merits at that time. In preparing a new proposal, Aurizon Network may have regard to the QCA's policies and principles set out in this final decision.

THE ROLE OF THE QCA—TASK, TIMING AND CONTACTS

The Queensland Competition Authority (QCA) is an independent statutory body which promotes competition as the basis for enhancing efficiency and growth in the Queensland economy.

The QCA's primary role is to ensure that monopoly businesses operating in Queensland, particularly in the provision of key infrastructure, do not abuse their market power through unfair pricing or restrictive access arrangements.

The DAAU review

On 1 December 2017, Aurizon Network submitted a draft amending access undertaking seeking changes to arrangements for the pricing of electric traction services and the recovery of electric system costs (the 2017 AT5 DAAU).

Under section 142 of the QCA Act, the QCA is required to consider the DAAU and either approve, or refuse to approve, it.

In accordance with section 147A of the QCA Act, the QCA must use its best endeavours to decide whether to approve, or refuse to approve, the DAAU within six months, excluding any day when submissions are sought.

In accordance with those requirements, the six-month period was scheduled to expire on 17 September 2018. The QCA has met this requirement.

Consultation

The QCA had two rounds of consultation on the AT5 2017 DAAU—with submissions on Aurizon Network's proposal due by 8 February 2018 and submissions on the QCA's draft decision by 29 June 2018.

Submissions were provided by: Aurizon Network; Aurizon Operations; Fitzroy Australia Resources; Kestrel Coal Resources & Rio Tinto Coal Australia; Pacific National; Queensland Resources Council; Rio Tinto Coal Australia; and Terracom. These are available on the QCA's website.

1 INTRODUCTION

In the 2017 electric traction draft amending access undertaking (the 2017 AT5 DAAU), Aurizon Network proposed to amend its approved 2016 access undertaking to change the pricing arrangements for electric traction services in the Goonyella and Blackwater systems. Aurizon Network said the amendments were required to address existing distortions in the pricing signals for electric traction services, and to ensure it separately recovered the efficient costs of its Blackwater and Goonyella electrification investments.

The QCA published Aurizon Network's proposal, received submissions from stakeholders, and assessed the proposal based on the relevant criteria in the QCA Act.

This document completes the QCA's response to Aurizon Network's proposal.

The QCA has assessed the 2017 AT5 DAAU in the context of the statutory access regime in the QCA Act and, in particular, the object of part 5 (s. 69E) and the other criteria for reviewing undertakings in section 138(2) of the QCA Act.

The criteria include promoting economically efficient operation of, use of and investment in regulated infrastructure, with the effect of promoting competition in related markets. They also encompass the legitimate business interests of Aurizon Network, the interests of access seekers and access holders, and more broadly, the public interest and also other factors specified in section 138(2).

In reaching a decision, the QCA sought to find an appropriate balance between competing factors, where these existed.

1.1 The electric access tariff (AT5)

Aurizon Network has installed infrastructure for electric traction in its Goonyella and Blackwater systems.¹ The rail electric infrastructure includes two main types of equipment—the wires running above the tracks on the electrified sections, and the feeder stations which provide power to those wires at the correct voltage and current. The service also requires dedicated assets provided by Powerlink and Ergon to connect Aurizon Network's electric infrastructure with the electricity transmission network.

Above-rail operators in the Goonyella and Blackwater systems can use electric or diesel locomotives. Goonyella largely operates as an electric system, and Blackwater is a mixed system, with both electric and diesel train services.

An electric access tariff (AT5) is paid by the access holders that use electric locomotives. The tariff seeks to recover the capital, maintenance and operating costs for Aurizon Network's electric infrastructure as well as Powerlink's and Ergon's charges to Aurizon Network for the use of its transmission networks. A separate electric energy charge (EC) is levied to recoup the costs of the electricity supplied, as a pass-through.

The AT5 tariff component is calculated separately for the Goonyella and Blackwater systems, by dividing the regulated costs of providing access to the electric infrastructure in each system by the expected demand for electric traction in that system over a regulatory period. Demand for

¹ The Moura and Newlands (including GAPE) systems are diesel-only systems.

electric traction is measured on an electric gross tonne kilometre (egtk) basis, which is a weight-and distance-based measure. Diesel-powered trains do not pay AT5.

If, in a given year, Aurizon Network under- or over-recovers AT5 revenue, the revenue cap adjustment mechanism varies future AT5 charges paid by the users of electric traction services. The EC tariff is not subject to a revenue cap adjustment mechanism.

1.2 Aurizon Network's 2017 AT5 DAAU

On 1 December 2017, Aurizon Network submitted the 2017 AT5 DAAU, in which it proposed changes to arrangements for:

- pricing of electric traction services—transferring variable charges associated with electric connections from AT5 to the EC
- recovery of electric system costs—to allow Aurizon Network to recover some electric infrastructure costs from diesel traction users when there is an under-recovery of AT5 revenue and electric utilisation falls below specific levels.

Aurizon Network said these changes were required to address issues with the current pricing approach that distort price signals for electric traction services. It said the current pricing arrangements created a 'real stranding risk' for its electric traction assets and put pressure on its ability to recover its efficient costs in providing traction choice (that will, in turn, affect operators' use and investment in electric rollingstock).²

Aurizon Network said these issues needed to be dealt with in advance of near-term reinvestment decisions so that future efficient investment in electric traction infrastructure would be recoverable. It noted that it has ongoing obligations to operate, maintain and provide access to electric traction but is currently not incentivised to reinvest significant capital in electric assets, given the shortcomings of the current AT5 pricing approach.³

Aurizon Network said it has taken account of feedback from customers and rail operators as well as the principles the QCA set out in response to Aurizon Network's previous proposals (the 2011 and 2013 DAAUs).⁴ In doing so, Aurizon Network proposed a 'minimal socialisation proposal' that:

- applied minimal changes to the existing tariff structures—to minimise complexity and any impact on existing rail haulage arrangements
- was based on current electric traction utilisation rates—to avoid uncertainty around predicting forecast utilisation levels and provide a measure of grandfathering for existing diesel services
- applied a cost to diesel users where utilisation levels fell—so there was no socialisation if utilisation remained at or above current levels

² Aurizon Network, sub. 2, p. 5.

³ Aurizon Network, sub. 2, pp. 14–15.

⁴ In July 2012, the QCA published a draft decision not to approve Aurizon Network's 2011 DAAU. Aurizon Network subsequently withdrew that DAAU and developed a revised proposal as the 2013 DAAU. In November 2013, the QCA published a draft decision not to approve the 2013 DAAU. See QCA, *QR Network Electric Traction Service Draft Amending Access Undertaking*, 2012 and QCA, *Blackwater Electric Traction Pricing Draft Amending Access Undertaking*, 2013.

- provided for traction neutrality—so users can choose the form of traction that will be most efficient in the long term.⁵

1.3 Assessment criteria

The QCA has assessed Aurizon Network's 2017 AT5 DAAU against the requirements set out in the *Queensland Competition Authority Act 1997* (the QCA Act).

Section 143(2) of the QCA Act provides that the QCA may approve a DAAU only if it considers it appropriate to do so having regard to the matters mentioned in section 138(2) (see Box 1).

Section 138(2) of the QCA Act sets out a list of criteria which the QCA must have regard to, but it does not require any one factor to be given primacy over another.

The matters listed in section 138(2) give rise to different, and at times competing, considerations that need to be assessed and balanced in deciding whether it is appropriate to approve a DAAU. For instance, there may be some tension between Aurizon Network's legitimate business interests and the interests of access seekers and access holders, or other stakeholders. There may also be tensions between the interests of different access seekers and access holders, given their different level of exposure to impacts from change and their past traction choices. Broader public interest considerations may also, at times, need to be balanced against the interests of individual stakeholders.

1.4 Regulatory process

Aurizon Network submitted the 2017 AT5 DAAU for approval under the 2016 access undertaking. Aurizon Network also said that it intends, to the extent appropriate tariff reform can be achieved through the 2017 AT5 DAAU process, to incorporate reformed arrangements in future regulatory periods.⁶

The QCA's decision on the 2017 AT5 DAAU is based on the evidence and information available, having regard to the statutory assessment criteria.

Consultation

The cooperation of both Aurizon Network and other stakeholders has been important in examining the matters raised. This included providing information through public submissions⁷ and in response to additional information requests⁸, which assisted the QCA to better understand Aurizon Network's proposal, the objectives it is seeking to achieve and the way it intends to achieve them, and the impacts on other parties.

⁵ Aurizon Network, sub. 2, p. 6.

⁶ Aurizon Network, sub. 2, pp. 7, 15.

⁷ Aurizon Network provided supporting documentation to its 2017 AT5 DAAU. Submission were received from: Aurizon Network; Aurizon Operations; Fitzroy Australia Resources; Kestrel Coal Resources & Rio Tinto Coal Australia; Pacific National; Queensland Resources Council; Rio Tinto Coal Australia; and Terracom. These are available on the QCA's website.

⁸ The QCA sought further clarification and additional information from Aurizon Network and other stakeholders to support their view and claims. This information was provided to the QCA on a confidential basis.

Box 1: Factors affecting approval of a draft access undertaking

Section 138(2) of the QCA Act states that the QCA may approve a draft access undertaking only if it considers it appropriate to do so having regard to each of the following —

- (a) the object of part 5 of the QCA Act, which is:
 - to promote the economically efficient operation of, use of and investment in, significant infrastructure by which services are provided, with the effect of promoting effective competition in upstream and downstream markets (s. 69E)
- (b) the legitimate business interests of the owner or operator of the service;
- (c) if the owner and operator of the service are different entities – the legitimate business interests of the operator of the service are protected;
- (d) the public interest, including the public interest in having competition in markets (whether or not in Australia);
- (e) the interests of persons who may seek access to the service, including whether adequate provision has been made for compensation if the rights of users of the service are adversely affected;
- (f) the effect of excluding existing assets for pricing purposes;
- (g) the pricing principles in s. 168A of the QCA Act, which in relation to the price of access to a service are that the price should:
 - (i) 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; and
 - (ii) allow for multi-part pricing and price discrimination where it aids efficiency; and
 - (iii) not allow a related access provider to set terms and conditions that discriminate in favour of the downstream operations of the access provider or a related body corporate of the access provider, except to the extent the cost of providing access to other operators is higher; and
 - (iv) provide incentives to reduce costs or otherwise improve productivity;
- (h) any other issues the QCA considers relevant.

Section 138(3) of the QCA Act provides, among other things, that the QCA may approve the DAAU only if it is satisfied the proposed undertaking:

- (a) is consistent with any access code for the service; and
- (b) is not inconsistent with a ruling relating to the service that is in effect under division 7A of part 5 of the QCA Act.

There are no applicable access codes or rulings in effect under division 7A.

Future DAAUs

The QCA has refused to approve the 2017 AT5 DAAU. If Aurizon Network wishes to have a new or modified version of its AT5 2017 DAAU assessed it will need to submit a further DAAU, which the QCA will then consider.

The QCA has considered the 2017 AT5 DAAU in the context of the terms and conditions contained in the 2016 access undertaking. This means if in the future any measures to change AT5 pricing arrangements were approved, such measures would only apply to the then current access undertaking—and will not automatically have effect in future regulatory periods. Instead, such measures would need to be introduced as part of any review of replacement or future access undertakings⁹, or as a new DAAU once a new undertaking is in place. The QCA would then assess that proposal.

The QCA's assessment of the 2017 AT5 DAAU does not limit the way in which the QCA will consider whether to approve a replacement undertaking or any subsequent DAAUs. The QCA will consider any future proposal on its merits at that time, and take account of any new information or arguments that may arise.

1.5 Decision

For the reasons set out below, the QCA's decision under section 142 of the QC Act is to refuse to approve Aurizon Network's 2017 AT5 DAAU. The QCA accepts that Aurizon Network's proposal goes some way to address the concerns raised by the QCA and others in previous consideration of these matters, but significant issues remain, particularly in the implementation and expected operation of the proposed approach. For the reasons set out in this document, the QCA does not consider the 2017 AT5 DAAU is appropriate to approve, having regard to the matters in section 138(2) of the QCA Act.

Pursuant to section 142(3)(b), the QCA has identified the way in which it considers it is appropriate to amend the AT5 DAAU.

1.5.1 Summary of section 138(2) considerations

For convenience a summary of section 138(2) considerations is set out below. Detailed comments are set out in relevant chapters.

Transferring variable charges from AT5 to the EC

The QCA considers, in principle, that transferring variable charges from AT5 to the EC (where there is no additional cost to access seekers and access holders) provides a more transparent and appropriate allocation of relevant costs, and is consistent with the object of part 5 of the QCA Act, is in the interests of access seekers and access holders and is in the public interest (ss. 138(2)(a),(d) and (e)). The proposal also potentially benefits access seekers and access holders, because it is likely to reduce fluctuations in annual adjustments and reduce take-or-pay charges (s. 138(2)(d)). The proposal does not adversely affect Aurizon Network's interests (s. 138(2)(b)) and is consistent with the pricing principles (s. 138(2)(g)). Having regard to all section 138 considerations, including those mentioned above, the QCA believes that in principle, a transfer of variable charges may be appropriate.

⁹ The QCA is separately considering Aurizon Network's 2017 access undertaking proposal, which does not reflect the pricing arrangements included in the 2017 AT5 DAAU.

However, having regard to matters specified in section 138(2), the QCA does not consider it appropriate to approve Aurizon Network's proposal in its current form, as it does not appear to be intended to apply to the current regulatory term and does not include specific pricing adjustments to AT5 and EC for the purposes of schedule F, in the DAAU as lodged. These omissions raise concerns as to whether the amendments are necessary at this point in time and raises uncertainty as to the timing and the method for implementation. Given these matters, the QCA considers the proposal, considered in its entirety, is not consistent with the object of part 5, is not in the interests of access seekers and access holders, nor in the public interest, and may have other adverse consequences (Chapter 3) (ss. 138(2)(a),(d),(e) and (h)). It appears that the proposal submitted is in the legitimate business interests of Aurizon Network (s. 138(2)(b)).

Accordingly, having regard to all matters in section 138(2), the QCA considers that it is not appropriate to approve the current proposal and has identified matters to be addressed before the proposal could be approved.

Incorporating an electric revenue adjustment

The QCA considers, on balance and in principle, that amending the 2016 access undertaking to allow an electric revenue adjustment could be appropriate in some circumstances. This would require adopting appropriate measures and thresholds such that the socialisation of AT5 under-recovery will only occur in very limited circumstances—when the risk of electric infrastructure bypass is most likely and material and is not simply, for example, in response to one-off shocks—and ensuring socialised amounts are least likely to further distort users' usage and investment decisions.

The QCA recognises there are many competing factors relevant to a decision to provide for socialisation (Chapters 2 and 4). One relevant consideration is that users who do not, and may never intend to, use electric traction will be required to contribute to the ongoing costs of electric infrastructure. The QCA understands significant investments have been made in diesel locomotives. This means socialisation may, on a case-by-case basis, be said not to be in the interests of certain access seekers and access holders, including where substantial investment decisions have already been made (s. 138(2)(e)).

However, the QCA considers a proposal to provide for socialisation could, in principle, and subject to comments below, be seen to promote the economically efficient operation and use of, and investment in, relevant networks in a manner consistent with the object of part 5 of the QCA Act, by assisting to mitigate asset bypass and asset stranding risks, including by dampening an AT5 price spiral. For similar reasons, that proposal could be seen to be in the public interest and consistent with other relevant factors (see Chapter 4) (ss. 138(2)(a), (d) and (h)).

However, the QCA does not consider that it is appropriate to approve Aurizon Network's proposal as submitted. Matters which the QCA considers require attention include the method of measuring the level of electric traction use, the threshold levels for application of the electric revenue adjustment and the investment approval process, particularly investment controls. Aurizon Network proposed an electric traction utilisation measure which, in the view of the QCA, does not adequately measure the use of electric infrastructure. It does not deal with the effects of new entrants and does not appear to be technology neutral. This could well result in distorted calculations, which would be contrary to the object of part 5, not be in the public interest, contrary to the interests of access seekers and access holders and inconsistent with other relevant matters (Chapter 4) (ss. 138(2)(a), (d), (e), (f) and (h)). Additionally, Aurizon Network proposed threshold levels that are too high in the context of the likelihood of any bypass and stranding risks and that are likely to trigger premature and unnecessary socialisation of costs.

The QCA believes these outcomes are contrary to the promotion of effective competition, do not facilitate appropriate pricing signals and are, accordingly, inconsistent with the object of part 5 and the public interest (ss. 138(2)(a) and (d)). The proposed thresholds do not appear to minimise the likelihood of socialisation of costs, do not appear to preserve traction neutrality and do not appear to appropriately address other factors relevant to the potential socialisation of costs including the 'user pays' principle. Accordingly, the proposed thresholds are considered contrary to the interests of access seekers and access holders and not in the public interest and do not appropriately address other relevant issues (ss. 138(2)(d), (e) and (h)).

Also, Aurizon Network has not proposed to include specific provisions, in the DAAU as lodged, for planning and controls on future investment in electric traction infrastructure, although it did provide sample drafting that it may include in a future DAAU to give effect to this. The lack of these provisions could result in unnecessary infrastructure or over expenditure on infrastructure. These outcomes do not appear consistent with the object of part 5 nor the public interest, and are not in the interests of access seekers or access holders and do not appropriately address other relevant matters (Chapter 4) (ss. 138(2)(a), (d), (e) and (h)). Additionally, the Aurizon Network proposal raises questions as to consistency with pricing principles mentioned in s. 168A (s. 138(2)(g)) which are discussed in more detail in Chapter 4.

The 2017 AT5 DAAU

After having regard to all relevant factors, and considering the 2017 AT5 DAAU as a whole, the QCA does not consider it is appropriate to approve Aurizon Network's proposal as submitted.

1.5.2 Report structure

- *Chapter 2* assesses the need for reform and the implications of using a short-term mechanism to address a long-term issue.
- *Chapter 3* assesses Aurizon Network's proposed cost reallocation of variable charges from the AT5 to the EC tariff components.
- *Chapter 4* assesses Aurizon Network's proposed revenue adjustment mechanism, focusing on the socialisation of costs, trigger thresholds, and any implications for Aurizon Network's future investment in electric infrastructure.

2 IMPLICATIONS OF PRICING ARRANGEMENTS FOR ELECTRIC INFRASTRUCTURE

The pricing of access to Aurizon Network's electric network has been the subject of considerable stakeholder interest and debate for a more than a decade. During that time, Aurizon Network has proposed a range of amendments to pricing arrangements for electric assets, with a focus on the electric access tariff (AT5) component of access prices. While the proposals have differed in detail and/or justification, they have all had the common objective of addressing potential distortions in pricing signals that may result in a bias against the use of electric traction.¹⁰

This chapter examines the issues with the existing pricing arrangements that Aurizon Network has identified and is seeking to solve through pricing reform via the 2017 AT5 DAAU. It focuses on the potential implications of existing pricing arrangements on operators' traction choices and the flow-on effects on Aurizon Network's ability to recover the costs of its electric traction assets (section 2.1). It finds that AT5 pricing arrangements can influence operators' traction choices, but the impact is likely to be constrained, given important countervailing factors also exist. This has implications for the likelihood that Aurizon Network's electric assets will be bypassed (or ultimately become stranded) (section 2.2).

Aurizon Network proposed to 'rebalance' the pricing framework to, among other things, potentially require diesel users to contribute to the cost of providing electric traction infrastructure, whether they use the infrastructure or not. This approach would provide Aurizon Network with revenue certainty, but would likely have adverse effects for some access holders and some customers. Accordingly, the QCA is requiring amendments to the proposed arrangements, to make socialisation unlikely (only occurring when there is material risk of electric infrastructure bypass). The detailed assessment of Aurizon Network's proposal is in Chapters 3 and 4.

2.1 Implications of existing arrangements

Aurizon Network recovers costs related to electric traction through the AT5 component and the electric energy charge (EC).

The AT5 tariff component averages the cost to Aurizon Network of distributing and maintaining the electric system across all electric train operators in a system. This means a reduction in the use of the existing electric infrastructure results in an increase in the AT5 charge, as Aurizon Network's costs of providing the electric infrastructure are recovered over a reduced pool of electric services.¹¹

Aurizon Network expressed concern that rising electric energy costs will encourage operators to switch to diesel, increasing the AT5 price paid by remaining electric operators and further impacting operators' decisions whether to run electric or diesel trains.

¹⁰ Aurizon Network's previous DAAU proposals, stakeholders' comments on them and the QCA's responses are available on the QCA website. In each case, the QCA released a draft decision not to approve the proposal. See QCA, *QR Network Electric Traction Service Draft Amending Access Undertaking*, 2012; QCA *Aurizon Network 2013 Blackwater Electric Traction Pricing Draft Amending Access Undertaking*, 2013. In response, Aurizon Network then withdrew the proposal, in order to develop a revised approach.

¹¹ Assuming the costs of providing the electric infrastructure remain the same.

It foresaw longer-term impacts on operators, the network, and the supply chain:

[I]n the event that existing electric locomotives start to be displaced by diesel, this may snowball into a rapid and disorganised transition to diesel as operators scramble to avoid the costs imposed by a rapidly escalating AT5 charge. This will result in high transition costs for operators needing to reinvest in diesel locomotives and substantial stranded electric network assets for Aurizon Network.¹²

2.1.1 Potential effect on traction choice

Rail operators can choose whether to run electric or diesel trains in the Goonyella and Blackwater systems and can manage their fleet to suit their operational decisions and commercial arrangements.

An operator's choice between diesel and electric is complex, being driven by many factors that include, but are not limited to, expectations about movements in the relative input costs for traction types. These costs include diesel fuel, electricity supply and AT5 access charges.¹³

Aurizon Network's modelling suggested that energy costs (diesel fuel costs, electricity supply costs and AT5 access charges) make up a small, but not insignificant, share of the total costs of raiiling.¹⁴ Aurizon Network nevertheless considered a material increase in AT5 charges will be a factor in operators' traction decisions.¹⁵ Aurizon Operations said short-term differentials in relative input costs can have material effects on traction choice, given diesel and electric traction have materially different cost curves—and the greater the cost differential, the more likely rail operators will switch.¹⁶

Energy costs vary over time (Figure 1), leading to changes in the relative competitiveness of electric traction compared to diesel, other factors remaining unchanged. Aurizon Operations said changes in the electricity generation mix and renewable energy schemes have increased electricity prices relative to diesel costs, with FY17 representing the largest cost differential over the period since 2007.¹⁷ It said that the large 'lumpy' nature of infrastructure investments (that flow through the regulated prices) also impact the competitiveness of electric traction.¹⁸

¹² Aurizon Network, sub. 2, p. 24.

¹³ Additional costs of diesel traction could include any costs of developing dedicated diesel provisioning facilities, costs of rail connections to these facilities, costs of increased environmental and safety compliance (for example, diesel spill protection and emissions), costs of the additional time taken for provisioning (including labour costs) and locomotive maintenance costs (Pacific National, sub. 5, pp. 12–13).

¹⁴ Aurizon Network, sub. 2, p. 12.

¹⁵ Aurizon Network, sub. 2, p. 30.

¹⁶ Aurizon Operations, submission to the QCA, *Aurizon Network's 2017 Draft Access Undertaking*, 2017, pp. 7–8.

¹⁷ Aurizon Operations, submission to the QCA, *Aurizon Network's 2017 Draft Access Undertaking*, 2017, p. 9.

¹⁸ Aurizon Operations, sub. 3, p. 2.

Figure 1 Diesel and electricity prices—indexed to 2004–05

Sources: AER, annual volume weighted average spot prices; AIP, terminal gate prices.

The QCA was advised that declining diesel prices combined with increasing electric energy prices have resulted in electric traction losing its historic cost advantage over diesel. Energy costs of diesel and electric traction are now close to parity in the Goonyella System and electric traction is at a significant cost disadvantage in the Blackwater System.¹⁹

Aurizon Network was concerned the 'average price' nature of AT5 will act to further widen the cost differential—improperly discouraging users from using or investing in electric locomotives in the longer term.²⁰

Operators who intend to switch traction types are more likely to do so when they are required to replace existing locomotives that have reached the end of their physical lives, or make additional rollingstock investment to meet increased demand. Expectations about movements in energy prices and AT5 could influence decisions to retire and replace locomotives, but other factors are also important. These could include the quantity and timing of an order for new locomotives (and of other orders in Australia or globally), the size of the fleet and the share of a particular traction type in that fleet. For example, an operator with a large fleet made up of predominantly one traction type might have an incentive to continue using that traction technology to avoid additional costs from switching.

¹⁹ Aurizon Network, sub. 2, p. 12; Aurizon Operations, submission to the QCA, *Aurizon Network's 2017 Draft Access Undertaking*, 2017, p. 3.

²⁰ Aurizon Network, sub. 2, p. 30.

Potential effect on Aurizon Network's infrastructure

Aurizon Network has invested in and maintained the electric traction network across the Goonyella and Blackwater systems. Aurizon Network said it has legal obligations to operate, maintain, and provide access to electric traction infrastructure through the declared service, its tenure obligations and the standard access agreements.²¹ Aurizon Network said its obligation to provide access to electric traction infrastructure, regardless of its level of usage, created a stranding risk which Aurizon Network both cannot avoid and is unreasonably exposed to.²²

Aurizon Network was concerned that under current pricing arrangements, a reduction in electric utilisation could trigger the so-called 'death spiral' where AT5 charges increase, sometimes substantially, for continuing electric users—increasing the risk of a wholesale move to diesel, and creating significant uncertainty over the future use of parts of its electric network.

Users have the option to switch between electric and non-electric tractions without any penalties. As a result, electric traction could be stranded even when the demand is strong while the non-electric traction offers a more cost effective transportation solution.²³

Aurizon Network said this puts pressure on its ability to recover its prudent and efficient costs now and also influences its approaching reinvestment decisions in its electric network.²⁴ This, in turn, will have impacts on operators and the supply chain.

Aurizon Network and Aurizon Operations said that any incremental switch away from electric traction makes electric asset bypass more material and likely.²⁵

Limiting factors on size and timing of effects

The possibility of bypass and consequent stranding risk for Aurizon Network's electric assets reflects the ability and incentive for operators (or their customers) to switch from electric to diesel.

Traction choice is a complex issue, as it depends on a variety of factors that can change over time. This includes changing relative fuel costs (and AT5 access charges); changing capital cost and operating and maintenance costs; changing technology and innovation of operating and maintenance practices; as well as site specific topography, sunk assets and track configuration.

While existing agreements provide for both traction choices²⁶, the information provided by stakeholders to the QCA suggests that in reality switching can be problematic:

- In some cases, there may be no real foreseeable option to switch between traction types. There are some services where only diesel trains can operate, because sections of track do not have electric infrastructure²⁷, or because services require diesel trains due to operational constraints such as a service requiring push/pull configuration.²⁸

²¹ Aurizon Network, sub. 2, pp. 8–10.

²² Aurizon Network, sub. 2, p. 4.

²³ Aurizon Network, submission to the QCA, *2017 Draft Access Undertaking (UT5)*, 2016, p. 272.

²⁴ Aurizon Network, sub. 2, p. 15.

²⁵ Aurizon Network, sub. 12, p. 15; Aurizon Operations, sub. 9, pp. 1–2.

²⁶ The approved standard form access agreement does not limit an access holder's choice between electric and/or diesel traction types.

²⁷ Terracom has contracted diesel train services for the expected duration of its Blair Athol mine, because the line to its mine and the connection to the main Goonyella system were not electrified. It said electrifying the line was not operationally or economically feasible to do so, due to safety, grade, train configuration, distance and ownership issues (Terracom, sub. 8, p. 1).

²⁸ Pacific National, sub. 5, p. 14; Rio Tinto, sub. 7, p. 2.

- While existing diesel and electric price relativities might provide a (short-term) incentive to switch to diesel, decisions to switch are longer-term decisions. It is not clear that diesel prices will remain consistently lower than electricity prices.²⁹
- If an operator wants to switch between traction types, the opportunity to retire and replace locomotives is constrained, at least in the short term, given the long lives of locomotives, timelines for delivery and other costs specific to individual traction choices.³⁰

In any event, if such a risk does materialise throughout the regulatory period, Aurizon Network also has some ability to manage it within the regulatory framework. For example, the 2016 access undertaking provides that the take-or-pay arrangements for expansions include the AT5 tariff component (schedule F, cl. 3.3(n)). New or different obligations could also apply in future access undertakings. Aurizon Network can also use broader contracting arrangements to protect its interests.

Potential effect on operators

Rail operators have the option to run electric and diesel trains in the Goonyella and Blackwater systems:

- Goonyella largely operates as an electric system, and Blackwater is a mixed system, with both electric and diesel train services.
- All three operators run electric locomotives, although the size of the fleet and mix between electric and diesel varies between operators.³¹

Aurizon Network recovers electric-traction-related costs from access holders that use electric locomotives through the AT5 and EC tariff components.³²

Diesel operators do not pay AT5 (or the EC), but still have electric infrastructure available to them, should they choose to switch to electric traction in the future. Aurizon Network said diesel users benefit from having this 'free option' to use electrical infrastructure at a cost to electric users who absorb a component of the cost of that choice.³³ Stakeholders said the benefits from this option have not always existed (for example, where Aurizon Network has not been able to provide electric traction to all customers)³⁴, will be effectively zero for some operators (with no real option to switch)³⁵, and should be properly assessed based on the value of the option to the potential option user (not on the cost needed by Aurizon Network to recover the cost of the electric infrastructure).³⁶

²⁹ Pacific National, sub. 5, p. 12; Rio Tinto, sub. 7, pp. 1–2.

³⁰ Pacific National, sub. 5, pp. 9–10.

³¹ Aurizon Operations primarily operates electric trains in Goonyella and Blackwater. Pacific National primarily operates electric locomotives in Goonyella. It is planning to commence more regular electric locomotive operations in Blackwater in the near future such that its mix will be approximately 80% diesel and 20% electric (Pacific National, sub. 5, p. 4). BMA runs electric trains.

³² Any under-recovery of expected AT5 revenue is recovered through the revenue cap adjustment resulting in increases to AT5 charges in a future period. The EC is a pass-through.

³³ Aurizon Network, sub. 2, p. 4.

³⁴ QRC, sub. 6, p. 6.

³⁵ Rio Tinto, sub. 7, p. 2.

³⁶ Pacific National, sub. 5, p. 10.

Aurizon Network and Aurizon Operations said AT5 is highly sensitive to electric utilisation—so it will be driven by (competing) operators' traction choices.³⁷ This means that switching to diesel may provide a benefit to an individual user, but will also raise the AT5 costs of all remaining electric users.³⁸ Aurizon Operations said:

Whilst each decision makes economic sense for the individual user, the outcome may be a greater, countervailing increase in costs to other users.³⁹

Other impacts

Aurizon Network said that under existing arrangements, a wholesale switch to diesel traction that results in a decline in the use, or the stranding, of Aurizon Network's electric traction assets will have broader macro-economic and social impacts, including increases in Queensland regional electrical infrastructure costs and the ability for Queensland and Australia to meet future emissions targets.⁴⁰

Aurizon Operations noted that the resolution of the pricing issue must allow the supply chain to flexibly respond to cost implications of climate change policies and contribute, rather than negatively impact, achievement of climate change commitments.⁴¹

2.2 QCA's view on pricing arrangements

The QCA accepts that having AT5 as an average price may distort signals—and that the current approach allows for the possibility of spiralling AT5 charges that could lead to infrastructure bypass and ultimately asset stranding, at least in theory.

However, the evidence suggests it is unlikely that any distortions from the existing AT5 approach will result in significant bypass or stranding in practice, especially in the short and medium term.

The QCA does not agree with Aurizon Network and Aurizon Operations that each incremental switch brings the system materially closer to an AT5 demand deterioration spiral.

While it is possible for operators to switch between traction types, this is unlikely to happen often or, in that event, very quickly. A range of factors influence the overall costs and timing of bringing new locomotives into the fleet that include, but are not limited to, expectations about future movements in relative costs for traction types. The QCA has not been provided with conclusive evidence that AT5 pricing is a key driver of operators' commercial decisions over traction choice.

The QCA notes Aurizon Network said that electric utilisation in the Blackwater system has increased steadily since FY09 to its expected maximum. Electric utilisation in the Goonyella system has been consistent and sustained at close to 100 per cent since at least FY04.⁴²

An appropriate response to potential distortions from AT5 pricing arrangements

In developing its response to these issues, the QCA sought to find an appropriate balance between, at times, competing considerations. For example, while Aurizon Network's proposal provides it with revenue certainty and could go some way in dampening any AT5 price spiral

³⁷ Aurizon Network, sub. 2, p. 13; Aurizon Operations, submission to the QCA, *Aurizon Network's 2017 Draft Access Undertaking*, 2017, p. 7; Aurizon Operations, sub. 9, p. 2.

³⁸ Aurizon Network, sub. 2, p. 31.

³⁹ Aurizon Operations, sub. 3, p. 2.

⁴⁰ Aurizon Network, sub. 2, p. 5.

⁴¹ Aurizon Operations, sub. 3, p. 4.

⁴² Aurizon Network, sub. 2, p. 11.

(should one materialise within the regulatory period), it also has the effect of shifting costs and risks between users on a system (including shifting costs to diesel users that do not, and may never intend to, use electric traction).

The QCA notes that Aurizon Network seems to acknowledge these tensions. Aurizon Network said that it had sought, to the extent possible, to recover AT5 costs from electric services only—and to provide for the minimum contribution necessary from diesel users required to address stranding concerns.⁴³ Under its 'minimum socialisation' approach:

- electric infrastructure costs are recovered from electric services to the extent possible
- any impact on diesel users is commensurate only with the cost of providing the option they retain at all times to change traction choice.⁴⁴

Aurizon Network said the resulting increase in total access charges for all services (including diesel services) from reform will be minor when electric traction remains the dominant traction type.⁴⁵ Stakeholders have argued that the impacts on diesel services become more substantial as electric utilisation falls. The QRC estimated that costs in the order of \$85 million for the Blackwater system and \$68 million for the Goonyella system would transfer to diesel users in the case of zero electric utilisation.⁴⁶

The QCA accepts the size of the adjustment that is socialised (i.e. to be recovered from the AT3 tariff component instead of the AT5 tariff component) will be larger when electric volumes decline significantly. However, the overall impact of socialisation on individual users will depend on the mix of users in the system and the composition of their contracted access rights. This is because all users (diesel and electric) end up paying higher AT3 charges. This means the effect on diesel users from any socialisation is likely to be more pronounced in Blackwater (where there is a higher share of diesel users to start with).

Moreover, the arrangements as the QCA understands them, only deal with short-term or random shocks to the system. Persistent declines in electric traction use may not be socialised, so falling demand and a rising average price over the medium to long term are not addressed (see below).

The implications of using a short-term mechanism to address a long-term issue

Aurizon Network's proposal uses a short-term (within regulatory period) mechanism to seek to deal with an issue that is only likely to be realised in the long term (across multiple regulatory periods). Pacific National commented in its response to the draft decision that it preferred that AT5 pricing issues be raised in access undertaking reviews rather than within a regulatory period.⁴⁷ In contrast, Aurizon Operations wanted a within-period structure that spanned multiple regulatory periods to give stakeholders price certainty.⁴⁸

The QCA considers asset stranding risk within a regulatory period (and in particular within the remainder of the 2016 access undertaking) is likely to be immaterial—but it may become more of a concern when considered across multiple regulatory cycles. This means that arrangements that provide appropriate safeguards within the regulatory period will also require reconsideration, on their merits, at any future reset.

⁴³ Aurizon Network, sub. 2, p. 34.

⁴⁴ Aurizon Network, sub. 2, p. 6.

⁴⁵ Aurizon Network, sub. 2, pp. 28, 37.

⁴⁶ QRC, sub. 6, p. 5.

⁴⁷ Pacific National, sub. 10, p. 5.

⁴⁸ Aurizon Operations, sub. 9, pp. 3-4.

The size of an AT5 shortfall will reflect the difference between forecast electric volumes (made at the beginning of a regulatory period) and realised electric volumes during the regulatory period. The QCA notes the proposed AT5 revenue shortfall adjustment mechanism breaks the relationship between decreasing volumes of coal railed by electric locomotives (measured in egtk) and increasing AT5 charges within a regulatory period. This provides Aurizon Network, and others, with an assurance that within-period unexpected declines in electric utilisation will not result in an AT5 price spiral. However, it will not deal with persistent declines in electric utilisation across multiple regulatory periods, nor guarantee the 'orderly exit' of Aurizon Network's electric infrastructure assets. Persistent declines in egtk across multiple regulatory periods will be incorporated into forecast egtk. Such matters, if they eventuate, would be fully considered at the DAU stage and an appropriate and tailored regulatory response can be considered by the QCA at that time.

3 TRANSFER OF VARIABLE CONNECTION CHARGES

Aurizon Network recovers electric-traction-related costs through the following components of access charges:

- The electric access tariff (AT5) recovers the cost of the operation, provision and maintenance of the electric traction infrastructure, which comprises overhead lines, transformers, track sectioning equipment and high voltage connection points.⁴⁹
- The electric energy charge (EC) recovers the cost of the electricity consumed by the electric locomotives.

Aurizon Network proposed to change the way some variable charges are recovered. It proposed to transfer the variable charges associated with electric connections from the AT5 cost base to the EC through what it defines as the 'variable connection charge'.⁵⁰

Aurizon Network proposed drafting that would give effect to this transfer, but did not amend the tariff components to reflect this, pending the finalisation of 2017 draft access undertaking.⁵¹ In response to the QCA's draft decision, Aurizon Network included sample drafting showing how it might allocate this charge and update the relevant tariffs.⁵² However, the sample drafting did not show process steps that must be consistently applied for each year in the regulatory period.

This chapter examines Aurizon Network's proposed cost reallocation, focusing on the method used by Aurizon Network in reallocating costs from AT5 to the EC and the likely impacts of the reallocation on system users. The QCA supports the proposed cost reallocation approach in principle, but notes that it would need to be fully implemented in a new AT5 DAAU, to make it appropriate for the QCA to approve.

3.1 Method for reallocating the cost base

Aurizon Network's proposal

Aurizon Network proposed to transfer variable charges associated with electric connections from the AT5 cost base to the EC (Figure 2).⁵³ The EC would then recover:

- transmission and connection charges that vary with electricity usage, such as transmission use of system (TUOS) charges
- energy consumption charges.

As a result, AT5 would reflect the cost of maintaining the electric infrastructure, including:

- operating and maintenance costs associated with using the electric traction, which includes transmission, fixed connection charges and insurance
- return of assets (i.e. depreciation)
- return on assets (i.e. weighted average cost of capital (WACC))

⁴⁹ Aurizon Network, sub. 2, p. 10.

⁵⁰ Aurizon Network, sub. 2, p. 25.

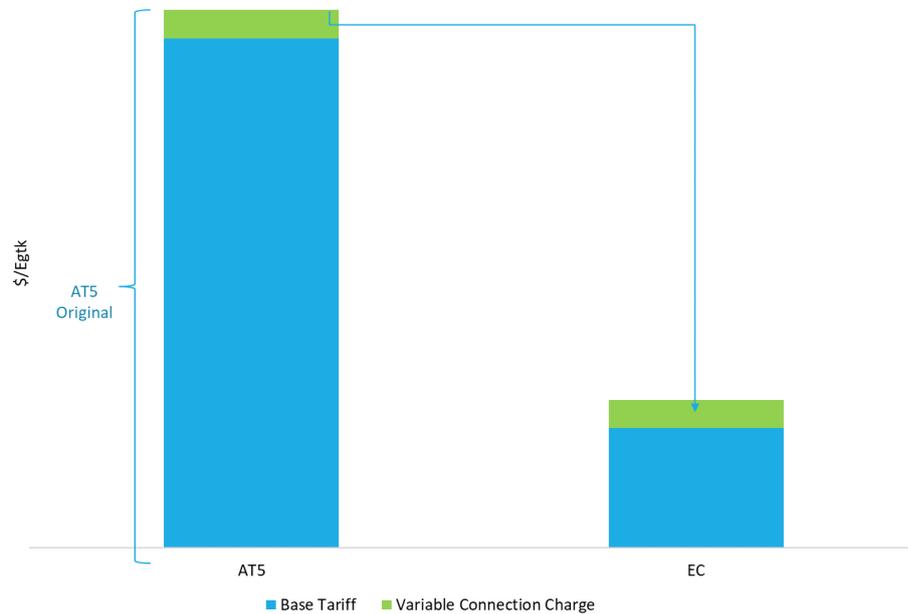
⁵¹ Aurizon Network, sub. 2, p. 27.

⁵² Aurizon Network, sub. 13, pp. 388, 390, 392–94.

⁵³ Aurizon Network, sub. 1, p. 349.

- interest and tax.⁵⁴

Figure 2 Illustrative cost reallocation



Aurizon Network gave effect to its proposal through:

- defining a new term, 'variable connection charge' as 'any variable charges associated with electric connections, billed on an energy consumed basis'⁵⁵
- adding the variable connection charge to the list of items recovered via the EC tariff.⁵⁶

Aurizon Network said its proposed cost reallocation would not apply in the 2016 access undertaking period—and the tariffs for the Blackwater and Goonyella systems will be set as per the approved transitional tariffs.⁵⁷ It initially estimated that its proposal would transfer approximately \$0.18 per egtk from AT5 to the EC (on the basis of its proposed 2017 AU tariffs).⁵⁸ Examples of the reallocation, in Aurizon Network's submission on the QCA draft decision, showed a reduction in the AT5 of:

- \$0.19 per egtk in Blackwater
- \$0.16 per egtk in Goonyella.

The corresponding increase in EC charge was \$0.17 per egtk in both systems.⁵⁹

⁵⁴ Aurizon Network, sub. 2, p. 10.

⁵⁵ Aurizon Network, sub. 1, p. 292.

⁵⁶ Aurizon Network, sub. 1, p. 349.

⁵⁷ Aurizon Network, sub. 2, p. 27.

⁵⁸ Aurizon Network, sub. 2, p. 27.

⁵⁹ Aurizon Network, sub. 12, p. 7; Aurizon Network, sub. 13, pp. 388, 390, 392–94.

Stakeholders' comments

Stakeholders generally had no fundamental concern with the cost reallocation approach.⁶⁰ Some stakeholders argued that all variable costs should be reallocated from the AT5 cost base to the EC.⁶¹ Mainly, it is important to stakeholders that any cost reallocation should be executed in a transparent manner and the actual charges reflect costs incurred.⁶²

3.2 QCA analysis and decision

Decision summary: Cost reallocation

The QCA's decision is to refuse to approve Aurizon Network's proposal to provide for a variable connection charge.

While the QCA supports an approach that would transfer variable charges associated with electric connections from the AT5 tariff cost base to the EC tariff, the QCA considers it appropriate that Aurizon Network also provide updated AT5 and EC tariffs that reflect the reallocation. The cost allocation process used should be documented clearly in the DAAU and applied consistently to all subsequent years in the regulatory period. QCA have proposed amendments in Appendix A that would give effect to this recommendation.

The QCA considers an appropriate cost reallocation will provide for Aurizon Network to recover its approved costs, while access holders pay no more than previously. It will also provide more efficient price signals—where AT5 represents the cost of maintaining the electric infrastructure, while the EC will represent the cost of using it.

In principle, the QCA considers the proposed cost reallocation is appropriate. In forming this view, the QCA has considered whether:

- a reallocation would have material adverse effects on Aurizon Network, access seekers and access holders and on pricing (section 3.2.1)
- the cost reallocation methodology is consistent with the proposed definition of the variable connection charge (section 3.2.2)
- it is appropriate to transfer other variable costs into the EC (section 3.2.3).

3.2.1 Effects of variable connection charge transfer

Reallocating the charges is expected to have no adverse impact in Aurizon Network's legitimate business interests (s. 138(2)(b)).

Reallocating the charges is also expected to be consistent with the object of part 5 and may benefit access holders and access seekers (s. 138(2)(a), (e), (d) and (h)) because it:

- reduces fluctuations in the annual revenue adjustment process—as the remaining connection charges will be fixed, instead of relying on forecast volumes—resulting in a smoother and more consistent pricing profile for AT5

⁶⁰ QRC, sub. 6, p. 10; Fitzroy Australia Resources, sub. 5, p. 3; Pacific National, sub. 6, p. 7; Pacific National, sub. 10, p. 8.

⁶¹ QRC, sub. 6, p. 10; Fitzroy Australia Resources, sub. 5, p. 3.

⁶² Pacific National, sub. 6, p. 7; Pacific National, sub. 10, p. 8.

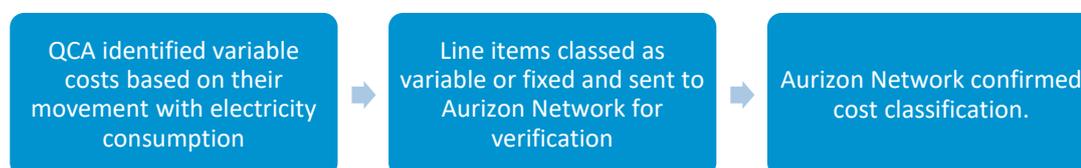
- reduces take-or-pay charges—because a lower AT5 price will be used to calculate tariffs for electric expansions⁶³—lowering underwriting costs, which may encourage investment.

The cost reallocation method is also consistent with the pricing principles in the QCA Act (s. 138(2)(g)), as it would:

- allow Aurizon Network to recover its efficient costs—as total costs paid by access holders from a railings perspective will not change—ensuring revenue adequacy (s. 168A(a))
- give rise to more transparent and cost-reflective tariffs—where AT5 will better represent the cost of maintaining the electric infrastructure, while the EC will represent the cost of using it—aiding in economic efficiency (s. 168A (b)).

3.2.2 Consistent methodology

To assess the reallocation method used by Aurizon Network, the QCA examined connection invoices for the 2016–17 financial year in the Goonyella and Blackwater systems.



The results of the QCA's connection cost analysis show the impact of Aurizon Network's proposed reallocation. The QCA's analysis suggests that the amount to be removed from the AT5 charge and incorporated into the EC is \$6.73 million for Goonyella, and \$5.13 million for Blackwater. This represents an 11.27 per cent transfer from AT5 in Goonyella (\$0.18/egtk) and 5.36 per cent in Blackwater (\$0.17/egtk), based on the 2016 access undertaking's 2016–17 tariffs, consistent with Aurizon Network's modelling.

The QCA's own cost reconciliation calculations found that Aurizon Network has reallocated the costs in a way that is consistent with the newly defined variable connection charge, and in a way that can be replicated if sufficient information is provided. Aurizon Network would need to continue to apply this method into the future to ensure consistency, and demonstrate that it has done so. The QCA considers the components of the combined EC should be separately identified to allow the electric energy cost pass-through to be transparent.

Aurizon Network submitted an example of updated tariffs in schedule F in response to the QCA's draft decision to show how it intended to allocate costs in the 2018–19 financial year.⁶⁴ These figures are similar to those reconciled by the QCA as part of the AT5 2017 DAAU; however, supporting data has not been provided for the QCA to verify a consistent treatment.

3.2.3 Other variable charges

Some stakeholders said all variable costs, including operating and maintenance, should be transferred to the EC, as the benefit of the infrastructure has been enjoyed solely by those currently using it.⁶⁵

⁶³ Aurizon Network, *Aurizon Network's 2016 Access Undertaking (UT4)*, schedule F, cl. 3.3(n), p. 364.

⁶⁴ Aurizon Network, sub. 12, p. 7; Aurizon Network, sub. 13, pp. 388, 390, 392–94.

⁶⁵ QRC, sub. 6, p. 10; Fitzroy Australia Resources, sub. 5, p. 3.

The purpose of operating and maintenance costs is to maintain the electric infrastructure to a reasonable service standard so it can be used by all access holders. This is different to consumption of variable connection costs, where the benefit accrues solely to the consumer that uses the EC and is independent of the electric infrastructure. Access holders who currently use electric infrastructure, as well as those who have the option to switch to it, all benefit by keeping the electric traction infrastructure in good working order. On this basis, the QCA considers that it would be reasonable that costs associated with service standard remain in the AT5, as they reflect part of the cost of maintaining the electric infrastructure (whether for those using it, or for those who are likely to use it in future).

3.3 Decision

Aurizon Network proposed to transfer the variable charges associated with electric connections from the AT5 cost base to the EC.

The QCA is of the view that a transfer of the variable charges may, in principle, achieve an appropriate balance of factors to be considered under the QCA Act (s. 138(2)(a),(b),(d),(e),(g), (h)) if it is implemented using a robust and consistent cost methodology. However, Aurizon Network's proposal did not fully implement the cost reallocation.

The 2017 AT5 DAAU included amendments to the 2016 access undertaking that would provide for the proposed reallocation approach, but did not seek to amend the AT5 and EC tariff components in schedule F. The inclusion of a variable connection charge that allows for cost reallocation without consistent application may create uncertainty about when the reallocation will occur and how often. This also has implications for any socialisation of AT5 under-recovery (see Chapter 4), since the amount will be larger than if AT5 costs had been reallocated.

While the QCA supports the proposed cost reallocation approach, Aurizon Network would need to implement it by updating the AT5 and EC provisions in schedule F of the 2016 access undertaking. Aurizon Network's submission on the QCA's draft decision provided an example of updated transitional tariffs, in the form of sample drafting, reflecting allocation of the variable connection charge.⁶⁶ This sample drafting would be appropriate to approve if it were resubmitted in a new proposal, with the reallocation process clearly documented and made mandatory.

To the extent that Aurizon Network's proposal is intended to only apply in future regulatory periods, the QCA would need to consider the approach and associated tariffs at that time. Factors that the QCA could have regard to include whether proposed arrangements:

- document the process to be used in allocating costs incurred and state that it must be applied each year
- reflect a process whereby Aurizon Network seeks approval of the variable connection charge from the QCA
- provide a complete application, which includes updated tariffs.

⁶⁶ Aurizon Network, sub. 13, pp. 388, 390, 392–94.

4 ELECTRIC REVENUE ADJUSTMENT

Aurizon Network considered the current AT5 pricing and revenue capping arrangements create a distortion of pricing signals, which threatens the full recovery of its electric infrastructure costs.⁶⁷

Aurizon Network proposed to change the way the revenue cap will operate to allow it to recover electric infrastructure costs from diesel traction users, where electric utilisation falls below specific levels in the electrified systems.⁶⁸

Aurizon Network said the objective of the proposed amendments is to reduce adverse AT5 pricing signals, in the event of declining demand for electric traction.⁶⁹

The QCA considers that while the proposal has merits, concerns around key implementation issues would need to be addressed in order for it to be approved.

This chapter examines Aurizon Network's proposal to allow it to recover electric infrastructure costs from all users in a system. It considers:

- the way in which the cost will be socialised (section 4.1)
- what will trigger a cost socialisation (section 4.2)
- the impact on investment incentives (section 4.3)
- other issues (section 4.4).

4.1 The electric revenue adjustment mechanism

Aurizon Network is entitled to recover a specific revenue target each year in the undertaking period from users of the electric infrastructure through the AT5 tariff component, based on forecast rail volumes. Where actual revenue earned in a financial year differs from the revenue target, this under- or over-recovery, including interest accrued at the regulated rate of return, is levied on AT5 two years into the future. The process is contained in schedule F of the 2016 access undertaking and is known as the revenue cap.

Aurizon Network's proposal

Aurizon Network has proposed the inclusion of an electric revenue adjustment to the revenue cap, which is to apply separately to the Blackwater and Goonyella systems.⁷⁰ Aurizon Network proposed that an electric revenue adjustment take effect where:

actual AT5 revenue is lower than allowable AT5 revenue in a given year

- electric utilisation in a system is less than a specified utilisation floor, defined as $egtk > gtk$ within a system.⁷¹

The value of the electric revenue adjustment would be the lesser of:

- the AT5 revenue shortfall due to variation in electric utilisation compared to forecast, and

⁶⁷ Aurizon Network, sub. 2, p. 5; Aurizon Network, sub. 12, p. 3.

⁶⁸ Aurizon Network, sub. 1, p. 368.

⁶⁹ Aurizon Network, sub. 2, p. 26.

⁷⁰ Aurizon Network, sub. 1, p. 368.

⁷¹ Aurizon Network, sub. 1, p. 368.

- the AT5 revenue shortfall amount.⁷²

The electric revenue adjustment would then be recovered from all users in the system through the revenue cap in the AT2–AT4 adjustment.⁷³ Aurizon Network said this would be levied on AT3⁷⁴, but did not provide drafting to reflect this.

Aurizon Network proposed utilisation floors of 98 per cent for the Goonyella system and 75 per cent for the Blackwater system.⁷⁵ These thresholds would apply immediately and may continue to be used in determining the AT5 charge for all future periods.⁷⁶ Aurizon Network chose these thresholds to reflect the forecasts it submitted in the 2017 DAU. It said that electric costs will continue to be recovered from only electric users if the forecasts are achieved or 'while electric traction remains the preferred traction mode for market participants'.⁷⁷

Stakeholders' comments

Stakeholders' responses to the proposal and the QCA's draft decision to refuse to approve it were mixed. Aurizon Operations supported the electric revenue adjustment because it sought to balance the interests of stakeholders and addressed the longer-term interests of rail operators and the supply chain in preserving traction choice.⁷⁸ Both Aurizon Network and Aurizon Operations said that each incremental switch away from electric traction contributes to the spiral and so is material.⁷⁹

While Fitzroy Australia Resources supported the electric revenue adjustment in principle, and noted it would be likely to be less contentious in Goonyella, it said that further adjustments are required to rebalance the significant shift of risk to Aurizon Network's customers.⁸⁰

The stakeholders who were concerned with Aurizon Network's proposal to socialise costs said that it:

- was not consistent with a 'user pays' principle, so customers end up paying for the infrastructure they do not use⁸¹
- favoured Aurizon Network's related party, resulting in a reduction in competition in the above-rail market⁸²
- was not traction neutral, favouring electric locomotives⁸³

⁷² Aurizon Network, sub. 1, p. 368; Aurizon Network, sub 2, p. 26.

⁷³ Aurizon Network, sub. 1, p. 362.

⁷⁴ Aurizon Network, sub 2, p. 26.

⁷⁵ Aurizon Network, sub. 2, p. 26.

⁷⁶ Aurizon Network, sub. 2, p. 26.

⁷⁷ Aurizon Network, sub. 2, p. 26

⁷⁸ Aurizon Operations, sub. 3, p. 4; Aurizon Operations, sub. 9, p. 1.

⁷⁹ Aurizon Network, sub. 12, p. 12; Aurizon Operations, sub. 9, p. 2.

⁸⁰ Fitzroy Australia Resources, sub. 5, pp. 1, 2.

⁸¹ QRC, sub. 6, p. 3; Pacific National, sub. 6, pp. 7, 8; Kestrel Coal Resources & Rio Tinto Coal Australia, sub. 11, p. 1; Pacific National, sub. 10, p. 3.

⁸² QRC, sub. 6, p. 8; Pacific National, sub. 6, pp. 9, 16, 17; Rio Tinto Coal Australia, sub. 8, p. 1; Kestrel Coal Resources & Rio Tinto Coal Australia, sub. 11, p. 2; Pacific National, sub. 10, p. 12.

⁸³ Pacific National, sub. 6, pp. 10, 11; Pacific National, sub. 10, pp. 9, 12.

- altered the economics of sunk investments, penalising existing users who had made longstanding investment decisions based on the existing framework⁸⁴
- provided inappropriate capital expenditure incentives, shifting the risk of excessive capital expenditure from Aurizon Network to access holders and seekers.⁸⁵

In response to our draft decision to refuse to approve Aurizon Network's proposal, Aurizon Network identified ways that the AT5 2017 DAAU could be revised, which it considered would make the electric revenue adjustment appropriate to approve.⁸⁶ This included lowering the proposed utilisation floors, introducing a further test before the electric revenue adjustment is triggered and excluding expansion volumes.

QCA analysis and decision

Decision summary 4.1: Electric revenue adjustment

The QCA's decision is to refuse to approve Aurizon Network's proposed electric revenue adjustment.

The way in which the QCA considers it appropriate to amend would be for Aurizon Network to:

- select an appropriate electric utilisation measure to provide a proxy for electric traction use as discussed in section 4.2 of this decision
- set a lower electric utilisation floor, as discussed in section 4.2 of this decision
- include capital expenditure rules for electric infrastructure, as discussed in section 4.3 of this decision
- reallocate the variable connection charge from the AT5 to the EC as a necessary condition in the electric revenue adjustment calculation, as discussed in section 4.4 of this decision.

The QCA considers including a mechanism to socialise cost will only be appropriate in limited circumstances. In this instance, Aurizon Network's electric revenue adjustment mechanism will need to balance, among other things, the benefits from dampening any AT5 price spiral (and the possibility of bypass and stranding) with the costs of requiring users to pay for infrastructure they do not use and may never intend to use. The electric revenue adjustment mechanism should only be triggered where bypass risk becomes material and likely to facilitate a demand deterioration spiral.

An effective electric revenue adjustment mechanism should:

- be technology neutral, in that it does not seek to promote a particular technology as superior in terms of minimising overall system costs, and should ultimately promote

⁸⁴ QRC, sub. 6, pp. 7, 8; Pacific National, sub. 6, pp. 7, 14, 15; Rio Tinto Coal Australia, sub. 8, p. 1; Kestrel Coal Resources & Rio Tinto Coal Australia, sub. 11, pp. 1–2; Pacific National, sub. 10, p. 10.

⁸⁵ QRC, sub. 6, pp. 6, 8, 9; Pacific National, sub. 6 pp. 8, 16, 17; Fitzroy Australia Resources, sub. 5, pp. 1, 2; Rio Tinto Coal Australia, sub. 8, pp. 1, 2; Pacific National, sub. 10, p. 9.

⁸⁶ Aurizon Network, sub. 12, pp. 13–19.

competition in downstream markets by allowing the participants to determine the preferred traction technology (ss. 138(2)(d),(e))

- encourage both the efficient use of infrastructure and efficient investment in infrastructure (s. 138(2)(a))
- provide for Aurizon Network to recover efficient electric investment costs (s. 168A(a))
- be based around the user pays principle, to the extent possible—and if this is not possible, there should be minimal distortion to traction choice to facilitate the efficient use, investment and operation of electric infrastructure and promote competition (ss. 138(2)(a),(d)).

Despite the merits Aurizon Network’s proposal has, in that it addresses electric bypass risk, it cannot be approved in its current form, because:

- the socialisation trigger thresholds are too high, as maximum utilisation in the medium term does not represent a point where a demand deterioration spiral is likely to occur, favouring electric traction, which is anti-competitive (s. 138(2)(d))
- the measure of electric utilisation is too broad and is not in the interests of access seekers, focusing on relative volumes between traction choices rather than the use of electric infrastructure, thereby enabling socialisation to be triggered by new entrants where there is an AT5 revenue shortfall (s. 138(2)(e))
- the mechanism makes socialisation a likely outcome, violating the user pays principle. Socialisation should only occur where the demand deterioration spiral becomes material and likely, to enable efficient price discrimination (s. 138(2)(g)).

Rather than the mechanism solely aiming to manage the long-term risk of asset stranding, it potentially socialises even minor AT5 price variations that may arise during the undertaking period.

In order to achieve the key principles discussed above, Aurizon Network may consider amendments to the:

- utilisation measure and thresholds—to deal with the materiality of electric bypass and traction neutrality (section 4.2)
- investment incentives—to balance the compromise of the user paying with socialisation (section 4.3).
- socialisation test to include making the reallocated AT5 a necessary condition for the mechanism to be triggered, to minimise socialisation (section 4.4).

4.2 Utilisation measure and thresholds

Aurizon Network’s proposal is based on a measure of electric utilisation and defined threshold values, known as the electric utilisation floor. Socialisation of electric infrastructure costs across all users in a system is triggered when there is an under-recovery of revenue, and electric utilisation is below the threshold. A targeted measure of electric infrastructure use and appropriate threshold levels are central to the effective operation of the proposal.

Aurizon Network's proposal

Aurizon Network used market share, being the proportion of coal hauled by electric locomotives compared to total coal haulage in a given system, as a measure for electric utilisation. The thresholds proposed by Aurizon Network were as follows:

- 98 per cent in the Goonyella system
- 75 per cent in the Blackwater system.⁸⁷

Aurizon Network said these represent forecasts based on historical use of the electric infrastructure, which is currently near maximum utilisation in the medium term.⁸⁸

Aurizon Network said that by setting the electric utilisation floor at these levels, it would prevent distortion of future consumption decisions:

The Electric Traction DAAU will address this issue by establishing the current utilisation of the systems as a floor utilisation level, meaning that reductions in utilisation below the current level will not automatically increase the AT5 charge, thereby discouraging remaining electric users (or potential new electric users) from using the electric network.⁸⁹

By setting the electric utilisation floors at the initial forecast levels provided in the 2017 DAU period, Aurizon Network was seeking to maintain the current use of electric infrastructure and not discourage future uptake.⁹⁰

Stakeholders' comments

In initial submissions, Aurizon Operations supported the electric revenue adjustment as a whole⁹¹, and further supported the proposed threshold settings in a submission on the QCA draft decision.⁹² Where other stakeholders did comment on thresholds, the overall views were that the thresholds have been set too high; the levels should be lower than maximum utilisation; and the measure should specifically target electric traction use, not broader coal network activity.

The QRC and Pacific National both considered lower thresholds would be more appropriate, if the objective is to prevent the 'death' spiral, rather than protect the current use of electric infrastructure.⁹³

Pacific National was also concerned that the proposed thresholds were static. It suggested that a dynamic mechanism would be more appropriate, given ongoing year-on-year reductions in usage are more of a concern than one-off drops.⁹⁴

The QRC said that using a relative measure for electric traction as compared to the whole system is problematic, as new entrants electing to not use electric infrastructure could trigger cost socialisation.⁹⁵

⁸⁷ Aurizon Network, sub. 1, p. 259.

⁸⁸ Aurizon Network, sub. 2, p. 29.

⁸⁹ Aurizon Network, sub. 2, p. 30.

⁹⁰ Aurizon Network, sub. 2, p. 30.

⁹¹ Aurizon Operations, sub. 3, p. 4.

⁹² Aurizon Operations, sub. 9, p. 3.

⁹³ QRC, sub. 6, p. 4; Pacific National, sub. 6, p. 11; Pacific National, sub. 10, p. 11.

⁹⁴ Pacific National, sub. 6, p. 12; Pacific National, sub. 10, p. 11.

⁹⁵ QRC, sub. 6, p. 4.

In response to the QCA's draft decision, Aurizon Operations and Aurizon Network considered that egtks are an appropriate proxy for electric traction use.⁹⁶

Aurizon Network submitted an example of a modified electric revenue adjustment mechanism that incorporated egtk as an additional measure of electric traction use in response to the QCA's draft decision.⁹⁷ This measure allows for the exclusion of volumes transported over expansions. The example also had lower thresholds, based on its incremental switching argument (Chapter 2), being:

- 90 per cent in Goonyella
- 70 per cent in Blackwater.⁹⁸

QCA analysis and decision

In assessing Aurizon Network's proposal and responding to stakeholder comments, the QCA focused on two key parameters—how the level of electric traction use is measured, and the threshold for the socialisation trigger.

Measuring electric traction use

The electric utilisation measure could be a relative measure comparing electric traction use to system use (as proposed by Aurizon Network), or an absolute measure comparing electric traction use to a benchmark level. The QCA considered Aurizon Network's relative utilisation measure has advantages because it is simple and transparent and would be familiar to stakeholders. However, its disadvantages are that it can be affected by new entrants (where electric infrastructure use remains unchanged) and it is not technology neutral. Hence it may be appropriate to consider alternative measures of electric utilisation.

The QCA's draft decision did not indicate that a particular measure should be applied. Rather, the QCA considered a measure should:

- provide a reliable proxy for electric traction use, such as coal volumes hauled by electric locomotives or train paths occupied by electric trains
- remain technology neutral, so that increases in non-electric traction use, without an associated decline in electric usage, do not result in lower electric utilisation
- demonstrate a persistent decline in electric traction use, indicating a possible bypass of electric infrastructure
- be easily understood and transparent to stakeholders.

The QCA's draft decision was that Aurizon Network's utilisation measure does not fully meet these criteria.

In response to the above principles, Aurizon Network submitted an example of how it may alter its proposal to achieve them. Aurizon Network submitted a dual measure, retaining the relative measure and adding in an additional test for an absolute measure. This test takes into account whether actual egtk had fallen below a portion, based on the electric utilisation floor, of gtk

⁹⁶ Aurizon Operations, sub. 9, p. 2; Aurizon Network, sub. 12, p. 9.

⁹⁷ Aurizon Network, sub. 12, p. 9.

⁹⁸ Aurizon Network, sub. 12, pp. 14–17; Aurizon Network, sub. 13, pp. 263, 372–373.

hailed in the FY18 for each of the two systems.⁹⁹ The example also suggested the removal of certain expansion volumes in an attempt to make the measure technology neutral.¹⁰⁰

The QCA has evaluated Aurizon Network's suggested amendment and notes the method may improve the mechanism by explicitly dealing with egtk as a measure of electric traction use. However, the QCA has concerns that the amendment would still not meet the four principles above, because egtk as a measure:

- does not give a reliable proxy of electric traction use, comparing it to a fixed point in time (the FY18), which may be understated subject to flooding, market conditions and a myriad of other factors
- grandfathers current use to a fixed-point comparator, as historical gtk volumes may have no relation to future year volumes and would fail to take into account future system demand for coal haulage.

The QCA has examined the sample drafting associated with the removal of certain expansion coal volumes and has concerns with its application. The definition of an expansion is very broad and the application of the carve-out is discretionary. Removing volumes transported on expansion lines could lead to a complex solution that is difficult to audit, thereby going against the principle that the measure should be easily understood and transparent to stakeholders.

There are several issues with the application of the removal of expansion volumes in practice—for example, if a new diesel branch line is built and Aurizon Network excludes the expansion volume. Aurizon Network would remove volumes transported along this branch line but these would presumably enter the main line and be counted in the mechanism from that point. Aurizon Network has indicated this is appropriate, as the expansion has the potential to displace coal transported by electric traction.¹⁰¹ However, how much this additional capacity displaces electric haulage is debatable and would depend on spare capacity, something stakeholders have low visibility on. The expansion carve-out drafting introduces a degree of discretion over what volumes would be excluded in what is proposed to be a mechanical calculation. Lack of visibility around spare capacity and Aurizon Network's ability to apply discretion to volume exclusions reduces transparency and may not be technology neutral.

Possible alternative absolute measure

An example of an alternative additional trigger the QCA may consider appropriate to approve, subject to stakeholder comment, would be actual egtk being lower than a benchmark egtk value that would be set for each year of a regulatory period. One approach for establishing such a benchmark egtk would be to base it on the forecast gtk and adjust it by an Electric Capacity Factor (discussed below) and the Electric Utilisation Floor (see threshold levels, discussed later in this chapter).

The Electric Capacity Factor is the maximum portion of the relevant coal system expected to be occupied by electric traction in the medium term. The QCA considers the percentages Aurizon Network advised in its proposal, as the medium-term maximum use of electric infrastructure, to be a reasonable proxy for these being:

- 98 per cent in Goonyella

⁹⁹ Aurizon Network, sub. 12, pp. 9–12; Aurizon Network, sub. 13, pp. 372–373.

¹⁰⁰ Aurizon Network, sub. 12, pp. 9–12; Aurizon Network, sub. 13, pp. 372–373..

¹⁰¹ Aurizon Network, sub. 12, p. 12.

- 75 per cent in Blackwater.

Applying these percentages to the per year gtk forecasts for the undertaking period would provide a proxy for the maximum use of electric infrastructure.

A new Electric Utilisation Floor would then be set for each system to provide a trigger threshold. The QCA has produced indicative numbers of 70 per cent for Goonyella and 60 per cent for Blackwater (see 'Threshold levels' discussed next in this chapter).

An application of the additional trigger the QCA considers appropriate for Aurizon Network to incorporate into its electric revenue adjustment is summarised in the following box.

Additional trigger test for absolute measure

- Actual egtk being less than Electric Capacity Factor*GTK system forecast*Electric Utilisation Floor
 - (1) Goonyella
 - Actual egtk being less than 98%*GTK annual system forecast*70%
 - (2) Blackwater
 - Actual egtk being less than 75%*GTK annual system forecast*60%

The associated clauses for the above amendments are contained in Appendix A and its rationale is outlined in the following section.

Tying the actual egtk to forecast gtk better captures electric bypass, differentiating it from a broader reduction in demand for coal on a given rail system, which is a separate issue. A reduction in electric traction use due to falling demand for rail services in general is not a bypass of electric infrastructure.

Incorporating this additional test into Aurizon Network's electric revenue adjustment mechanism will help satisfy the above four principles by:

- providing a reliable proxy for electric traction use, comparing actual egtk against a minimum level of egtk required for efficient use
- being technology neutral, as actual egtk are compared to a minimum level of egtk required for efficient use, independent of coal hauled by diesel consists
- indicating a persistent decline in egtk, as a fall below minimum level of egtk required for efficient use would mean a relative decline in electric traction
- improving transparency and understanding, as actual and forecast volumes are familiar to stakeholders and are readily available.

The Electric Capacity Factors used may need to be revised at the commencement of each regulatory period to take into account:

- further electrification of the network
- network expansions affecting the relative number of train paths that can be used by electric locomotives versus non-electric locomotives.
- productivity changes between diesel and electric consists or other such technology that can affect haulage volumes

Threshold levels

In the QCA's view, threshold levels (or the Electric Utilisation Floor) set near current maximum utilisation are higher than those that would cause a demand deterioration spiral. Having regard to the factors set out in section 138(2) in the QCA Act, the QCA considers that these settings do not achieve an appropriate balance between electric infrastructure bypass and cost socialisation; as the adjustment would trigger where coal hauled by electric locomotives falls below current operational levels.

An appropriate threshold is likely to be lower, but not so low as to render the mechanism ineffective (where socialisation will not be triggered, or be triggered too late to be effective). The threshold should:

- be set so that socialisation of costs is unlikely, only occurring when there is material risk of electric infrastructure bypass
- be low enough to avoid triggering socialisation during one-off shocks that do not represent a bypass of electric infrastructure, such as during cyclone Debbie
- be set high enough so that bypass is avoided—that is, the thresholds should not be so low that bypass of electric traction assets still occurs
- be designed to address a persistent decline in electric traction use and therefore should have a time component, which is adjusted to take account of changed conditions from one regulatory period to the next
- be adjusted if necessary when there are new entrants that are using diesel traction.

Aurizon Network responded to the QCA's draft decision by suggesting lower thresholds might be appropriate to the extent they prevent 'incremental switching'.¹⁰² The suggested thresholds were:

- 90 per cent in Goonyella (down from 98 per cent)
- 70 per cent in Blackwater (down from 75 per cent).¹⁰³

The decision to switch is complex and cannot be isolated to a single variable (see Chapter 2 for discussion on switching). This makes evaluating the total cost of traction choice a dynamic and ever-changing goal post; therefore, setting a threshold trigger requires judgement.

The QCA used an evidence-based framework, examining historical values of the AT5 tariff's effect on traction choice, in identifying indicative threshold levels. The rationale behind the approach of setting the threshold is that higher AT5 tariffs in the past were associated with increasing, not decreasing, electric traction uptake. Therefore the potential for AT5 to affect traction choice may be beyond these points. On this basis the QCA considers that Aurizon Network's proposed (and subsequently revisited) thresholds are too high and would not be appropriate to approve.

Based on its own indicative analysis the QCA has identified Electric Utilisation Floors that would indicate a material risk of electric infrastructure bypass, being in the order of:

- 70 per cent in Goonyella
- 60 per cent in Blackwater.

¹⁰² For a discussion on incremental switching, see Aurizon Network, sub. 12, p. 15; Aurizon Operations, sub. 9, pp. 1–2.

¹⁰³ Aurizon Network, sub. 12, pp. 14–17; Aurizon Network, sub. 13, pp. 263, 372–273.

To allow for changing market conditions in relative costs between traction type, the thresholds were set at values slightly above electric utilisation levels that would result in AT5 reaching the maximum prices for the most recent 10 years, adjusted for inflation. In the QCA's preliminary view, these levels would be high enough to assist in preventing a demand deterioration spiral, but low enough to make socialisation unlikely. These indicative threshold estimates would be open for review by the QCA in the event a similar AT5 DAAU is lodged in the future.

The QCA considers Aurizon Network's revenue adjustment, if it had a more targeted measure of electric use and lower thresholds, would more appropriately balance factors set out in section 138(2) of the QCA Act, including by:

- facilitating better price signals in the AT5 price, to aid in efficient use of electric traction, encouraging re-uptake where electric bypass has occurred (s. 138(2)(a))
- minimising socialisation, as it would only occur where the demand deterioration spiral may be material and likely—this is in the interest of access holders who do not use the service, and it promotes the efficient multi-part pricing (ss. 138(2)(e),(g))
- preserving traction neutrality, as unlikely socialisation promotes competition in above-rail markets (s. 138(2)(d))
- allowing Aurizon Network to continue to recover its efficient costs and manage the risks of bypass of electric infrastructure (ss. 138(2)(b),(g)).

Appropriate measure and threshold levels

By addressing the above comments, in addition to others set out in sections 4.3 and 4.4 of this decision, the 2017 AT5 DAAU (including our suggested amendments) may be considered to appropriately balance section 138(2) factors and would be consistent with the regulatory approach as discussed in the QCA's 2013 draft decision relating to AT5 pricing.¹⁰⁴ In the current economic environment where electric utilisation is high and electric infrastructure is currently not subject to a bypass risk, the necessity for socialisation is considered to be nil in the immediate future. A more targeted and dynamic measure of electric traction use coupled with lower thresholds may be considered to be consistent with the pricing principles including by working to:

- allow Aurizon Network to recover its efficient cost (s. 168A(a)), from users of the electric service and all users to the extent there is an under-recovery and electric asset bypass
- not over-signal the use of electric traction in preference of non-electric (s. 168A(b)), as socialisation would only trigger where electric bypass is realised
- not allow a related access provider to set favourable terms that discriminate in favour of downstream operations (s. 168A (c))
- provide an incentive for Aurizon Network to reduce electric infrastructure costs and improve productivity (s. 168A(d)), as the electric revenue adjustment is a short-term mechanism operating over an undertaking period to reduce bypass risk but does not guarantee removal of asset stranding risk in the long term.

Appropriately dealing with matters such as those above would help address the problem Aurizon Network is trying to solve, electric traction bypass, rather than preserve the current level of electric traction use. The QCA's comments above are not intended to be exclusive or

¹⁰⁴ See QCA, *Blackwater Electric Traction Pricing Draft Amending Access Undertaking*, 2013.

determinative and are provided by way of general guidance of matters to be addressed to assist with consideration by, and contributions in due course from, Aurizon Network and stakeholders.

Any revised proposal submitted by Aurizon Network would have to be considered as a whole when presented to the QCA and similarly submissions by stakeholders would require full consideration.

Ultimately, the measure and threshold levels that would avert the risk of a demand deterioration spiral are market-driven and could change over time. In practice, there is likely to be a range of measures and thresholds that might be appropriate. Based on historical data, the QCA has suggested indicative thresholds that it considers may be appropriate to approve given Aurizon Network's proposal. An example of amendments to the electric revenue adjustment mechanism that the QCA considers may be appropriate to approve, subject to any further consultation process, are contained in Appendix A.

4.3 Investment incentives

Aurizon Network's proposal provides a means of socialising electric infrastructure costs onto non-electric users within a regulatory period. If cost socialisation is introduced, more stringent investment controls would be required for electric infrastructure, in order to reduce the amount of underwriting that stakeholders who do not use this infrastructure may have to pay.

Aurizon Network's proposal

Aurizon Network said it would only undertake:

- expansion electric investment where it had sought and received pre-approval from the QCA that the investment scope was prudent and efficient
- expansion electric investment where it had obtained a commitment by customers to underwrite the project
- significant electric asset renewal projects where it had sought and received pre-approval from the QCA that the investment scope was prudent and efficient.¹⁰⁵

Aurizon Network did not make amendments to the undertaking to this effect because it believed the intent can be achieved with the expansion principles that are in place.

Stakeholders' comments

Most stakeholders considered Aurizon Network's investment incentives may be compromised by Aurizon Network's proposal and that provisions would need to be included to preserve a framework where Aurizon Network is accountable for poor investment decisions.

The concerns raised by stakeholders in relation to the investment incentives were:

- it reallocates risk of poor investment decisions away from Aurizon Network to access holders—who may not be able to manage this risk but will pay for it as socialised costs¹⁰⁶
- it encourages excessive investment in electric infrastructure by allowing costs to be socialised across all users in a system¹⁰⁷

¹⁰⁵ Aurizon Network, sub. 2, pp. 32, 36.

¹⁰⁶ Pacific National, sub. 6, p. 8; Fitzroy Australia Resources, sub. 5, p. 2; QRC, sub. 6, p. 9; Pacific National, sub. 10, p. 9.

¹⁰⁷ QRC, sub. 6, p. 9; Pacific National, sub. 10, p. 9.

- the proposal does not contain any additional provisions to deal with the altered investment incentives.¹⁰⁸

To ensure Aurizon Network continues to undertake prudent investment in electric infrastructure, stakeholders suggested:

- The undertaking should include a capital expenditure preapproval regime for electric infrastructure.¹⁰⁹
- Aurizon Network should produce a long-term plan for electric infrastructure that would assist stakeholders with their own investment planning, giving them more investment certainty.¹¹⁰
- The RAB optimisation clauses in schedule E, cl. 1.2(b)(ii) should be amended, to enable the continuation of the asset write-downs, in the event that electric assets become obsolete. The QRC believed Aurizon Network's regulatory asset base should not be guaranteed.¹¹¹

Aurizon Network responded to these requests, in its submission on the QCA's draft decision, by providing examples of a pre-approval regime that would only apply where a project exceeds \$20 million and would be accompanied by a non-binding customer vote.¹¹² Aurizon Network also proposed to publish an annual asset management plan that would include both sustaining and significant capital expenditure projects but did not reflect this in its sample drafting.¹¹³ Aurizon Operations said that any capital cost threshold being applied should be a backward looking aggregate to take into account the cumulative effects of many small projects throughout a year.¹¹⁴

QCA analysis and decision

The QCA considers the DAAU needs to provide for capital expenditure rules that specify that Aurizon Network will apply the rigorous approach to approvals for electric infrastructure that it has set out in its documents accompanying the proposed undertaking.

Aurizon Network's proposal for socialisation has the effect of reducing Aurizon Network's risk on new investments in electric traction infrastructure, and therefore increasing its incentive to build assets that may not be needed.

It is therefore essential that the measures to determine whether the infrastructure should be built, and to what standard it should be built, are particularly transparent, and are not subject to any doubt about what customers have signed up for.

The potential pitfalls were illustrated in the AT5 DAAUs of 2011 and 2013, in which Aurizon Network sought ex post underwriting of electric infrastructure in the Blackwater system that had only recently been built. The QCA said in its draft decision on the 2011 AT5 DAAU that it was odd that nearly new assets were already at risk of stranding.¹¹⁵ It added in its draft decision on the 2013 DAAU that it was:

¹⁰⁸ QRC, sub. 6, p. 8.

¹⁰⁹ QRC, sub. 6, pp. 6, 9; Fitzroy Australia Resources, sub. 5, p. 2.

¹¹⁰ Fitzroy Australia Resources, sub. 5, p. 2.

¹¹¹ QRC, sub. 6, p. 10.

¹¹² Aurizon Network, sub. 12, pp. 20–22; Aurizon Network, sub. 13, pp. 288, 335, 343.

¹¹³ Aurizon Network, sub. 12, p. 21.

¹¹⁴ Aurizon Operations, sub. 9, p. 4.

¹¹⁵ QCA, *QR Network Electric Traction Service Draft Amending Access Undertaking*, draft decision, 2012, p. ii.

concerned that a mechanism such as the UUP ['under utilisation payment'] as proposed in this DAAU, could be seen to underwrite, and therefore encourage, the development of unwanted future projects. Looking forward, future projects should still be assessed against the merits of effective capital expenditure approval processes and take-or-pay arrangements to ensure there remains a strong link between efficient costs and customer demand.¹¹⁶

A key underlying issue in the 2011 and 2013 DAAUs was the disparity between what stakeholders thought they had approved in a customer vote process, and the \$600 million in direct and indirect costs that Aurizon Network sought to underwrite.

Such unexpected outcomes may be avoided or managed through a transparent ex ante approval process, allowing customers to understand the scope and standard of the infrastructure investment and be supported through regulatory prudence and efficiency tests.

The QCA examined the example capital expenditure preapproval process that Aurizon Network may apply in a future DAAU on electric infrastructure. However, the QCA considers the example drafting would not be strong enough, given the potential to socialise these costs onto stakeholders who do not use this infrastructure.

To address this, the QCA would require Aurizon Network to re-define 'Significant Electric Investment' so as to capture the majority of electric infrastructure projects. This could involve applying a lower amount, for example, \$5 million, or by applying a cumulative amount over a year, for example, \$20 million. The QCA considers a cumulative project value would be an appropriate option.

Aurizon Network's failure to include specific measures for this in its AT5 2017 DAAU is not consistent with promoting efficient investment in its electric infrastructure (s. 138(2)(a)). It is therefore against the interests of access seekers and access holders, and not in the public interest (ss. 138(2)(d), (e) and (h)). Further, it is, in the QCA's view, not a legitimate business interest of Aurizon Network that it should seek to pass to customers the risks that it is better placed to manage (s. 138(2)(b)). On balance, it is not appropriate to approve the proposal.

What is required, is a robust pre-approval process for electric infrastructure investment, which requires that the prudence and efficiency of such an investment be demonstrated. This is largely already provided in the existing provisions in schedule E of the 2016 undertaking, but the specific requirements for seeking pre-approval of scope and standard need to be set out in relation to the electric infrastructure. The example provided in Aurizon Network's submission on the QCA draft decision sets out a preapproval process that would only apply to exceptionally large projects.

The QCA would require Aurizon Network to include drafting in its 2017 AT5 DAAU giving effect to a robust pre-approval process for electric infrastructure investment such as that provided in appendix A.

In response to the QRC's comment, the QCA maintains a view consistent with the 2016 access undertaking, which is that optimisation of assets out of the RAB is a last-resort scenario (s. 138(2)(f)). It is preferable that market-driven solutions are considered in the first instance, by negotiation between Aurizon Network and its customers. Having said this Aurizon Network must ensure that any proposed drafting does not affect the use of the asset optimisation provisions in the event they are required.

¹¹⁶ QCA, *Aurizon Network 2013 Blackwater Electric Traction Pricing Draft Amending Access Undertaking*, draft decision, 2013, p. v.

A robust preapproval process will promote efficient investment in electric infrastructure, and protect the interests of access seekers and holders, and more broadly be in the public interest (s. 138(2)(a), (d), (e) and (h)). It also may promote the interest of Aurizon Network, as it will reduce the chance of asset stranding (s. 138(2)(b)).

4.4 Other issues

A number of other issues were considered by the QCA in analysing Aurizon Network's proposal.

Diesel multiplier

Pacific National considered socialisation would adversely affect traction choice and allocate some of the infrastructure bypass risk to stakeholders. In return for the altered risk profile, stakeholders should be compensated by the removal of the diesel multiplier.¹¹⁷

The QCA understands that the purpose of the diesel multiplier was to address overall system efficiency issues imposed by diesel traction as compared to electric traction. This purpose is unrelated to the asset stranding risks that could arise from changes in utilisation of electric services. At this stage, and given that lower thresholds are required, the QCA does not consider that compensation is required for diesel users in the form of removal of the diesel multiplier.

Impacts on take-or-pay contracts

The QRC and Pacific National raised concerns with the use of the AT3 as a means to socialise the electric revenue adjustment as it increases the cost of non-electric users' take-or-pay contracts.¹¹⁸

Stakeholders consider the use of the AT3 tariff to socialise the electric revenue adjustment is inappropriate due to its use in users' take-or-pay contracts. Stakeholders were concerned that Aurizon Network would recoup additional take-or-pay revenues in subsequent years where socialisation has occurred, as this will be levied on a coal volume, which in aggregate may be higher than the electric volume forecasts.

Aurizon Network has established that the revenue capping mechanism prevents it from receiving windfall gains from take-or-pay revenues, as it is unable to receive more than its allowable revenue amount.¹¹⁹ On this basis the QCA would not require Aurizon Network to separate the electric revenue adjustment from the AT3 price take-or-pay.

Grandfathering of rights

A number of stakeholders commented that Aurizon Network's proposal would result in additional costs that were not contemplated when their contracts were written and thus alter the economics of their sunk investments.¹²⁰

The QCA considers if Aurizon Network amended the proposal in line with QCA recommendations, socialisation would be unlikely to occur in the current environment. Cost socialisation would only occur where a trend in electric bypass was persistent and, the demand deterioration spiral would be material and likely. While the risk profile of the stakeholder contracts would change, this change would not significantly alter the economics of past investment decisions in the current market environment.

¹¹⁷ Pacific National, sub. 6, pp. 10, 14.

¹¹⁸ QRC, sub. 6, p. 7; Pacific National, sub. 6, p. 8.

¹¹⁹ Aurizon Network, sub. 12, p. 23.

¹²⁰ QRC, sub. 6, p. 8; Pacific National, sub. 6, p. 7, 14, 15; Pacific National, sub. 10, p. 10; Rio Tinto Coal Australia, sub. 8, p. 1; Kestrel Coal Resources & Rio Tinto Coal Australia, sub. 11, pp. 1–2.

Mitigating a demand deterioration spiral

Aurizon Network's AT5 2017 DAAU has the intention of reducing the likelihood of electric bypass by reducing the AT5 average price through socialisation.

The QCA considers socialisation of costs to be a last resort and therefore Aurizon Network should do as much as possible to prevent adverse price signals before socialisation is considered. The QCA therefore requires Aurizon Network to reallocate the variable connection charge from AT5 to the EC as a necessary condition in its electric revenue adjustment (Chapter 3).

Above-rail competition and favouring a related party

Stakeholders raised concern that any socialisation of electric infrastructure would favour Aurizon Operations, would not be in the interests of access seekers or access holders and would be inconsistent with section 168A(c) of the QCA Act.¹²¹ Lower thresholds targeting a demand deterioration spiral would avoid this problem. A vertically integrated monopoly may have an incentive to favour its related party, but lower thresholds make it unlikely above rail operators will deliberately trigger the mechanism.

The QCA considers where electric bypass is being realised to a point that the AT5 price facilitates a demand deterioration spiral, it may be appropriate to allow potential socialisation of costs having regard to the factors in section 138(2) because:

- the QCA Act's s. 168A(b) does not prohibit price discrimination where it may aid in efficiency. An electric bypass that results in a rise in AT5, to the point where it creates a demand deterioration spiral, discouraging traction re-uptake would not be efficient (s. 138(2)(g))
- a demand deterioration spiral would be inconsistent with the object of part 5 of the Act, discouraging the efficient use, operation of, and investment in electric infrastructure, by raising the cost of access to the service (s. 138(2)(a), s. 168A(c))
- encouraging electric traction re-uptake where the technology is still competitive, in the absence of a demand deterioration spiral, would foster efficiency and promote competition in the above rail market (s. 138(2)(d))
- dampening an AT5 price spiral would reduce the cost of providing access to other operators who would otherwise use electric traction (s. 168A(c)).

4.5 Final decision

The QCA considers that it is not appropriate to approve the electric revenue adjustment mechanism proposed by Aurizon Network. The proposed mechanism is, most relevantly, considered:

- not traction neutral, favouring electric traction over non-electric traction use by grandfathering current electric utilisation levels. These levels, being the maximum use in the medium term, are well above levels that would facilitate a demand deterioration spiral (s. 138(2)(d))
- not in the interests of those who would seek access to the service, as new entrants who elect to use non-electric traction could trigger the cost socialisation (s. 138(2)(e))

¹²¹ Pacific National, sub. 10, p. 12.

- not consistent with the object of part 5 of the QCA Act, as the high thresholds would encourage the uptake of electric infrastructure in preference to the non-electric and would not facilitate the efficient use, operation or investment in the declared service as a whole
- not consistent with the pricing principles (s. 138(2)(g))

While the QCA may consider agreeing with the concept of socialisation to manage the risk of lower utilisation of electric infrastructure, the QCA is inclined to the view on current information that the concept should only apply where the risk of bypass is material and likely to adversely impact what would otherwise be efficient traction choice. The view of the QCA is that the utilisation thresholds of 98 per cent for Goonyella and 75 per cent for Blackwater are too high. A more appropriate trigger should, in our view, provide some protection from any AT5 price spiral, but also be more indicative of the genuine risk of asset bypass. This could be achieved by reducing the existing floor, and by constructing a different measure. The QCA has set out general principles (as noted above) for how the mechanism could be developed and has suggested amendments which are contained in Appendix A. Appendix A sets out the way in which the QCA presently considers it appropriate to amend the AT5 DAAU, based on the information before it. There may be other ways in which it is appropriate to amend the AT5 DAAU to address the matters in this Final Decision. If Aurizon Network lodges a new DAAU in the future, this would be subject to stakeholder consultation and consideration by the QCA pursuant to the QCA Act.

APPENDIX A: AMENDMENTS TO DAU

This Appendix sets out the way in which the QCA presently considers it appropriate to amend the AT5 DAAU, based on the information before it. There may be other ways in which it is appropriate to amend the AT5 DAAU to address the matters in this Final Decision. If Aurizon Network lodges a new DAAU in the future, this would be subject to stakeholder consultation and consideration by the QCA pursuant to the QCA Act.

<i>Clause</i>	<i>Text</i>
<i>Tariff reallocation</i>	
Schedule F. Cl. 2.2(a)	AT5 is the electric access tariff specified as the AT5 input for the nominated Reference Train Service as specified for the relevant Reference Tariff (for example, as specified in clauses 7.2 and 8.2, as applicable) where the Variable Connection Charge has been allocated to the EC; and
Schedule F. Cl. 2.2(a)	EC is the electric energy charge and includes the Variable Connection Charge which is initially (from the Commencing Date) as specified as the EC input for the nominated Reference Train Service as specified for the relevant Reference Tariff (for example, as specified in clauses 7.2 and 8.2, as applicable), and after the Approval Date as otherwise published by Aurizon Network on the Website on or about each 31 May during the Term after Aurizon Network seeks and obtains the QCA's approval for a new electric energy charge and Variable Connection Charge (taking into account any over or under recovery in the previous Year),
Schedule F. Cl. 2.2(e)	(e) When Aurizon Network publishes the EC, it must separately identify the level of the Environment Compliance Charge and Variable Connection Charge within the EC.
Schedule F. Cl. 2.2(f)	(f) In obtaining and seeking approval for the Variable Connection Charge discussed in Cl. 2.2(e) Aurizon Network shall provide to the QCA supporting invoices and calculation sheets clearly demonstrating the cost items and amounts that will be included in the Variable Connection Charge along with underlying assumptions used in identifying these cost components and how they are consistent with the definition of a Variable Connection Charge.
<i>Capital Expenditure</i>	
Schedule E. Cl. 2.1(f)	(f) Aurizon Network must promptly seek approval of capital expenditure for a project under this clause 2 following acceptance of a Voting Proposal in respect of that capital expenditure project under clause 4. For clarity, Aurizon Network must also seek QCA pre-approval under this clause 2 in respect of a Significant Electric Investment.
Schedule E. Cl. 4.2(a)(i)(B)	4.2 Identification of Interested Participants (a) The Interested Participants for a Voting Proposal are Customers, and Access Holders and Access Seekers without Customers, where: (i) the Access Charges (or likely Access Charges) relevant to the person: (A) are (or will be) determined by reference to a Reference Tariff; and (B) could be affected by including the amount of capital expenditure for a capital expenditure project into the Regulatory Asset Base; or (ii) the proposed capital expenditure project will impact on the person's contracted Capacity or Train Paths after construction of the proposed Expansion is completed.
<i>Revenue Adjustment Mechanism</i>	
Schedule F. Cl. 4.3	4.3 Calculation of Revenue Adjustment Amounts Obligation to calculate Revenue Adjustment Amounts

Clause	Text
	<p>After the end of each Year, Aurizon Network will calculate for that Year for each Reference Tariff:</p> <p>(a) an AT2-4 Revenue Adjustment Amount for that Reference Tariff by subtracting:</p> <p>(i) the Adjusted Allowable Revenue for AT2-4 (calculated under clause 4.3(c)) for that Reference Tariff; from</p> <p>(ii) the Total Actual Revenue for AT2-4 (calculated under clause 4.3(d)) in relation to that Reference Tariff, for that Year less, where clause 4.3(h) applies, the Electric Revenue Adjustment; and</p> <p>(b) an AT5 Revenue Adjustment Amount for that Reference Tariff by subtracting:</p> <p>(i) the Adjusted Allowable Revenue for AT5 (calculated under clause 4.3(c)) for that Reference Tariff; from</p> <p>(ii) the Total Actual Revenue for AT5 (calculated under clause 4.3(g)) in relation to that Reference Tariff, for that Year, except that where clause 4.3(h) applies, the AT5 Revenue Adjustment Amount must be adjusted by adding the Electric Revenue Adjustment.</p>
Schedule F. cl. 4.3(c)(iii)(B)	<p>Calculation of Adjusted Allowable Revenue</p> <p>(c)(iii) the components relating to the recovery of Aurizon Network's costs associated with the connection of Aurizon Network's electrical traction system to an electricity transmission or distribution network adjusted to reflect the difference between:</p> <p>(A) the actual costs for the relevant Year; and</p> <p>(B) the forecast costs used for the purpose of determining the relevant Reference Tariff for the relevant Year which includes the allocated Variable Connection Costs;</p>
Schedule F. Cl. 4.3(h)	<p>Calculation of Electric Revenue Adjustment</p> <p>(h) Where:</p> <p>(i) the relevant Reference Tariff is a System Reference Tariff, the AT5 component does not include any Variable Connection Charge which has been reallocated to the EC;</p> <p>(ii) there is a Decline In Electric Utilisation for the relevant Year;</p> <p>(iii) the eGTK for the relevant Year in respect of the relevant Coal System is less than the Electric Traction Bench Mark</p> <p>and</p> <p>(iv) there is an AT5 Revenue Shortfall for the relevant Year, the Electric Revenue Adjustment is the lesser of:</p> <p>(v) the amount calculated by multiplying the following amounts together:</p> <p>(A) the amount calculated by subtracting the Electric Utilisation Level from the Electric Utilisation Floor for the relevant Reference Tariff;</p> <p>(B) the aggregate actual gtk for the relevant Coal System that was used to calculate the Electric Utilisation Level; and</p> <p>(C) the relevant AT5 Reference Tariff; and</p> <p>(vi) AT5 Revenue Shortfall Amount.</p>
Definitions	
AT5 Revenue Shortfall	For a Year, the Total Actual Revenue for AT5 (calculated under clause 4.3(g) of Schedule F) in relation to that System Reference Tariff for that Year is less than the Adjusted Allowable Revenue for AT5 (calculated under clause 4.3(c) of Schedule F) for the relevant System Reference Tariff for that Year.
AT5 Revenue Shortfall Amount	For a Year, where there is an AT5 Revenue Shortfall, the amount by which Total Actual Revenue for AT5 (calculated under clause 4.3(g) of Schedule F) in relation to that System Reference Tariff for that Year is less than the Adjusted Allowable Revenue for AT5 (calculated under clause 4.3(c) of Schedule F) for the relevant System Reference Tariff for that Year.

Clause	Text
Decline In Electric Utilisation	For a Year, where the Electric Utilisation Level is less than the Electric Utilisation Floor for the relevant System Reference Tariff for that Year.
Electric Revenue Adjustment	The amount calculated under clause 4.3(h) of Schedule F.
Electric Traction Bench Mark	The minimum efficient use of electric traction determined by multiplying the Gtk Forecast for the relevant system reference tariff for that Year by the Electric Capacity Factor and Electric Utilisation Floor.
Electric Utilisation Floor	<p>a) For the System Reference Tariff applicable in the Goonyella System, 70% (being the fixed percentage threshold of the gtk in the Goonyella System using electric traction for the purposes of the Electric Revenue Adjustment); and</p> <p>b) For the System Reference Tariff applicable in the Blackwater System, 60% (being the fixed percentage threshold of the gtk in the Blackwater System using electric traction for the purposes of the Electric Revenue Adjustment).</p>
Electric Utilisation Level	For a Year, the aggregate actual egtk for that Year in the Coal System to which the relevant System Reference Tariff applies as a percentage of the aggregate actual gtk for that Year in that Coal System.
Electric Capacity Factor	<p>The maximum use that electric traction is expected to achieve in the medium term as set by the QCA being:</p> <p>(a) 98% in Goonyella and</p> <p>(b) 75% in Blackwater.</p>
Significant Electric Investment	<p>All capital projects for a Year for the:</p> <p>(a) enhancement (including by way of the replacement of life-expired, obsolete, less efficient, lost, damaged or destroyed infrastructure); or</p> <p>(b) expansion, of electric Rail Infrastructure on the Goonyella Coal System or Blackwater Coal System, in either case, where the aggregate of anticipated costs are more than \$20 million.</p>
Variable Connection Charge	Any variable charges associated with the electric connections, billed on an energy consumed basis as approved each year by the QCA under clause 2.2(a) of Schedule F.

SUBMISSIONS AND REFERENCES

Submissions

The QCA received the following submissions during its investigation of Aurizon Network's 2017 Electric Traction Draft Amending Access Undertaking (the 2017 AT5 DAAU). The submission numbers below are used in this decision for referencing purposes. The submissions are available on [the QCA website](#).

Aurizon Network proposal

	Sub. no.	Type of submission	Date
Aurizon Network	1	2017 Electric Traction Draft Amending Access Undertaking Aurizon Network's 2016 Access Undertaking (marked-up)	December 2017
	2	Supporting submission	November 2017

Stakeholder submissions on proposal

Stakeholder	Sub. no.	Type of submission	Date
Aurizon Operations	3	Submission on the 2017 AT5 DAAU	February 2018
Fitzroy Australia Resources	4	Submission on the 2017 AT5 DAAU	February 2018
Pacific National	5	Submission on the 2017 AT5 DAAU	February 2018
Queensland Resources Council	6	Submission on the 2017 AT5 DAAU	February 2018
Rio Tinto Coal Australia	7	Submission on the 2017 AT5 DAAU	February 2018
Terracom	8	Submission on the 2017 AT5 DAAU	February 2018

Stakeholder submissions on the QCA draft decision

Stakeholder	Sub. no.	Type of submission	Date
Aurizon Operations	9	Submission on the 2017 AT5 DAAU—QCA draft decision	June 2018
Pacific National	10	Submission on the 2017 AT5 DAAU—QCA draft decision	June 2018
Kestrel Coal Resources & Rio Tinto Coal Australia	11	Submission on the 2017 AT5 DAAU—QCA draft decision	June 2018
Aurizon Network	12	Submission on the 2017 AT5 DAAU—QCA draft decision	June 2018
	13	Submission on the 2017 AT5 DAAU—QCA draft decision	June 2018
	14	Submission on the 2017 AT5 DAAU—QCA draft decision	June 2018

References

Aurizon Network, *Aurizon Network's 2016 Access Undertaking (UT4)*, approved October 2016 as amended November 2017.

— submission to the QCA, *2017 Draft Access Undertaking (UT5)*, November 2016.

Aurizon Operations, submission to the QCA, *Aurizon Network's 2017 Draft Access Undertaking*, February 2017.

Australian Energy Regulator (AER), *Annual volume weighted average spot prices*, viewed 26 April 2018, <https://www.aer.gov.au/wholesale-markets/wholesale-statistics/annual-volume-weighted-average-spot-prices>.

Australian Institute of Petroleum (AIP), *Terminal gate prices (TGPs)*, viewed 26 April 2018, <https://www.aip.com.au/historical-ulp-and-diesel-tgp-data>.

Queensland Competition Authority (QCA), *QR Network Electric Traction Service Draft Amending Access Undertaking*, draft decision, July 2012.

— *Aurizon Network 2013 Blackwater Electric Traction Pricing Draft Amending Access Undertaking*, draft decision, November 2013.

Queensland Competition Authority (QCA), *Aurizon Network Electric Traction Draft Amending Access Undertaking*, draft decision, May 2018.