Depreciation Approaches at UT6

Prepared for Aurizon Network

September 8, 2025

Project Team

Will Taylor, PhD
Soren Christian
Alex Crawley

CONFIDENTIALITY

NERA
One International Towers
100 Barangaroo Avenue
Sydney NSW, Australia 2000
www.nera.com

Contents

1. Introduction and Summary

1.1. Introduction and Regulatory Background

Aurizon Network (**Aurizon**) is the operator of the below-rail assets of the Central Queensland Coal Network (**CQCN**), connecting the mines of four coal systems (Blackwater, Goonyella, Newlands and Moura) to ports to access global coal markets, primarily for the sale metallurgical coal for use primarily in steel production, with some additional sales of thermal coal for use in electricity generation. The Blackwater and Moura coal systems also support various domestic users of thermal coal.

Aurizon's assets in CQCN are subject to access arrangement regulation, with revenue and prices determined by the Queensland Competition Authority (**QCA**) in semi-regular undertakings (**UT**) submitted to the QCA by Aurizon. The next undertaking period, UT6, is due to begin in July 2027.[1]

Each access arrangement is based on a "building blocks" approach, in which is the maximum allowable revenue (**MAR**) is the sum of four components:

- Operating costs: the annual expenses dedicated to the operations and maintenance of the network;
- Depreciation costs: the gradual recovery of the principal costs of capital assets over the deemed life of those asset lives (sometimes referred to the as the "return *of* capital");
- Return *on* capital: the financing costs relating to those same capital assets, in between when they are added to the Regulated Asset Base (**RAB**) and when the principal costs are recovered through the depreciation element; and
- Tax Allowance: taxes are modelled in the cash flows with imputation adjustment.

In general, regulated networks are also compensated for the effects of inflation over the life of their assets, though the precise approach for doing so varies from regime to regime. In the case of CQCN, the total value of the RAB in each year is currently indexed to inflation.

In advance of the UT6 determination, Aurizon has engaged NERA to advise on the profile of recovery of capital costs, particularly through the approaches used to depreciate and inflate the RAB (the **Capital Recovery Approach**).

The "Existing Approach" for the recovery of capital costs was set in advance of the UT3 period in 2009, and has been renewed in the UT4 and UT5 determinations since then. The approach is as follows:

- All assets in the RAB are indexed to outturn inflation, and a nominal weighted average cost of capital (**WACC**) is applied for determining the return on capital building block. Because a nominal WACC includes compensation for expected inflation, in order to ensure that Aurizon is not compensated for inflation twice, the value of the RAB increase coming from inflation indexation is deducted from each year's MAR.

[1] Previous periods have varied in length from four to ten years, but we understand that they will now follow a five-year cycle going forward.

- Assets which were in the RAB before July 2009 are assumed to depreciate on a straight-line basis over the shorter of (a) physical life of that specific asset, or (b) the time remaining until the "Global Economic Constraint" of 2055.[2]
- Assets which are subsequently included in the RAB after July 2009 depreciate on a straight line basis over the shorter of (a) 20 years, (b) the physical life of that specific asset, (c) the time remaining until the Global Economic Constraint of 2055, or (d) the Weighted Average Mine Life (**WAML**) for that mine system, which would supersede the Global Economic Constraint. At the beginning of each new undertaking period, each asset's assumed asset life is reset to 20 years, unless either of the second two constraints is binding. We refer to this approach as the "**Rolling 20**" method, and it is a fundamental part of the modelling we subsequently carry out.

1.2. Change in Outlook Since Previous Access Undertakings

In the time since UT3 was determined in 2009, and indeed since this Existing Approach was confirmed at UT4 (2013) and UT5 (2017), uncertainty around the future usage of CQCN has increased, driven by greater uncertainty on both the global demand for coal and the supply of coal in the Central Queensland mine regions. For example:

- In between its 2017 and 2024 World Energy Outlook (**WEO**) forecasts, the International Energy Agency (**IEA**) has revised down its outlook for global demand use. For example, in the lowest usage case scenario, the global coal trade in 2050 could fall below Queensland's current level of production. The higher demand scenarios are not as stark, but it is impossible to know which scenario is most likely.
- Australian coal exports are dependent on the maintenance of strong trade relationships, some of which have become increasingly fraught in the past decade, for example a recent dispute between Australia and China which led to a two-year cessation of exports to China.
- On the supply side, coal production in Australia has become increasingly unpopular domestically among investors and the general population for environmental reasons. While this trend does not appear to have significantly influenced state or federal policy with respect to coal exports, these could be coming. Nevertheless, timeframes for mine approvals are extending and increasingly subject to legal challenge.[3]
- Due to the perception of regulatory risk as well as their own public pledges to act on climate-related risks, banks, insurers and other similar institutions may limit finance and insurance that

---

2 The Global Economic Constraint assumes that value of the assets in the RAB will be fully written down to zero by 2055 irrespective of the remaining physical asset lives. In practice, it would be expected this life would be reviewed to reflect trailing demand beyond 2055 as that date approaches.

3 For example, the approvals process for the New Acland Mine was completed in 2022 some 10 years after revisions to project proposal accepted by Commonwealth Minister for the Environment. See https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/completed-projects/new-acland-coal-mine-stage-3-project

In addition, on 24 July the NSW Court of appeal remitted the approval of the Mount Pleasant mine extension back to the Land and Environment Court to consider the impact of scope 3 emissions on the local environment. Denman Aberdeen Muswellbrook Scone Healthy Environment Group Inc v MACH Energy Australia Pty Ltd [2025] NSWCA 163.

is available to coal mines.[4] If financing for new and existing mines becomes restrictive, this could mean a progressive reduction in coal production in the Central Queensland mine systems.

This greater uncertainty around the future use of the network increases the risk that prices would need to rise substantially in the coming decades as the volumes upon which the MAR is recovered declines.[5] In light of these increased risks, it is appropriate to reconsider whether the existing approach remains appropriate.

1.3. Regulators are Responding to Demand Uncertainty by Frontloading Recovery

CQCN and Aurizon are far from unique among network industries in facing the risk of stranding as the supply and demand dynamics on either side of the network evolve. Indeed, network industrial regulators in Australia, the UK, and New Zealand are all responding proactively to the risk of potential asset stranding from uncertain future demand by allowing their regulated businesses to frontload the recovery of their RAB.

We list several examples below:

- In the Western Australian gas industry, the Economic Regulatory Authority (**ERA)** has approved the use of a Window of Opportunity Past (**WOOPS**) framework for the Dampier Bunbury Pipline's (**DBP**) next access arrangement, capping the economic life of the pipeline at 2063. The key insight from the WOOPS framework is that if there is a risk of stranding in the future, it is important for regulators to act sooner rather than later since frontloading depreciation will eventually have no impact as competitive forces control prices.
- In the Eastern Australian gas industry, the Australian Energy Regulator (**AER**) has allowed accelerated depreciation for each of its gas networks' access arrangements since 2021 due to the demand uncertainty for gas resulting from the transition towards net zero. The AER highlights the prudency of this approach to (a) incentivise networks to make efficient investments; (b) share risk between networks and consumers while the consumer base is still large, and (c) prevent the potential consequences from delaying a decision on accelerating capital recovery.[6]
- In the UK gas distribution industry, Ofgem has determined that accelerated depreciation is needed during the upcoming RIIO-3 period (beginning April 2026), because the current 45-year asset life assumption does not align with the Government's 2050 target for net zero. In its

4 The reduction in banking and insurance services to the coal mining sector was publicly scrutinized by the Joint Standing Committee on Trade and Investment Growth in 2021 with its inquiry into "The Prudential Regulation of Investment in Australia's Export Industries".

5 We highlight throughout this report that the range of plausible outcomes for the usage of CQCN has widened in recent years. However, we do not speculate on the *probability* of each outcome. Based on the range of plausible outcomes, usage of CQCN could indeed stay steady, but it is not possible to say at this stage. The Proposed Approach substantially reduces the cost of these low volume outcomes without substantially increasing costs today when usage of the network is steady.

6 Final decision Jemena Gas Networks (NSW) access arrangement 2025 to 2030 – Attachment 4 – Regulatory depreciation, May 2025, pp.8,10; AER, Draft decision Jemena Gas Networks (NSW) access arrangement 2025 to 2030 – Attachment 4 – Regulatory depreciation, November 2024, p.14.

recent RIIO-3 Draft Determination, Ofgem proposes to (a) retain existing depreciation policy on existing assets; and (b) set asset lives on new assets to fully depreciate by 2050, following the accelerated "sum-of-years'-digits" profile.[7], Ofgem considers this approach of splitting out existing and new assets to be "cautious but proactive", "without locking in a more aggressive policy that may later prove unnecessary or misaligned with government direction. This approach also avoids a sharp increase in consumer bills in the short term, which is particularly important given current affordability concerns."[8]

- In New Zealand, the New Zealand Commerce Commission (**NZCC**) has taken a probabilistic approach to the risk of asset stranding in both its 2022 gas default price path (**DPP3**) and 2020 Fibre Input Methodologies. For DPP3, the NZCC shortened asset lives by applying an asset adjustment factor to the average asset lifetimes based on its view of the likelihood of gas demand winding down by certain dates.[9] For Fibre, the NZCC implemented an ex ante allowance via cash flows based on its view of the probability of stranding over a certain time period and the proportion of the RAB that is stranded.[10] The NZCC has indicated it will update asset lives for its upcoming review for gas (DPP4) based on its updated view on the likelihood of the timeframe for the decline in demand.[11]

Therefore, recent regulatory precedent indicates that regulators view potential asset stranding from uncertain future demand as something that should be addressed proactively and adjusted as the demand outlook changes. Given this precedent, the increase in uncertainty around the future usage of CQCN, and the outdated nature of the Existing Approach, it is appropriate to reconsider whether the Existing Approach should be updated.

1.4. Modelling Aurizon's Proposed Approach to Capital Recovery

Given the change in outlook and the general regulatory trends in this direction, Aurizon has proposed the following three changes to the Existing Approach (the **Proposed Approach**):

- *All* assets (notably including those added before July 2009) would be subjected to Rolling 20 approach;
- New assets added after July 2027 would not be indexed to inflation, and accordingly the value of inflation on these assets would not be netted off of Aurizon's MAR.[12] Use of a non-indexed RAB is a common approach in other jurisdictions, most notably most of the regulated network industries in the United States.

7 For example, for a 20 year asset, in the first year it would depreciate by $\frac{20}{20+19+\cdots+1}$ of its initial value, and in the second year it would depreciate by $\frac{19}{20+19+\cdots+1}$ of its initial value, and so on.

8 Ofgem, RIIO-3 Draft Determinations – Finance Annex, 1 July 2025, paras. 8.29-8.42.

9 NZCC, Default price-quality paths for gas pipeline businesses from 1 October 2022 – Final Reasons Paper, 31 May 2022, Section 6.

10 NZCC, Fibre input methodologies: Main final decisions – reasons paper, 13 October 2020, para 6.1140 and pp.585-588.

11 NZCC, Gas DPP4 reset 2026 – Issues paper, 26 June 2025, para 4.5.

12 There would be an adjustment for the differences between forecast and outturn inflation to remove for inflation forecast risk embedded in the nominal WACC, but this is not the focus of this report.

- For the Moura system specifically, a WAML of 2048 would apply in place of the 2055 global economic constraint.

All of these adjustments would have the effect of modestly frontloading the recovery of capital costs of those assets (specifically, all assets except those added in between 2009 and 2027 outside of Moura would have additional frontloading under the Proposed Approach). In practice, frontloading recovery under the Proposed Approach would increase the MAR in the near term and decrease it further in the future (or limit future increases). However, this reprofiling would yielding the same Net Present Value (**NPV**) as the Existing Approach[13] and thus is NPV neutral.

To understand the impact of the Proposed Approach on CQCN customers, we have modelled the capital components of MAR (return on and of capital) and tariffs (i.e. excluding operating costs, which are invariant to this change) for both approaches under three scenarios of usage of the network through 2050:

- A **Base Case scenario**, which essentially assumes business as usual;
- A **Carbon Constrained scenario**, in which Asian seaborne demand is lower due to China thermal self-sufficiency, higher share of scrap-based EAF in crude steel production and early retirement of coal-fired power plants driven by government policy and significant reduction in renewable energy costs; and
- A **Carbon Shock scenario**, in which global demand for coal exports drops significantly, sharply reducing usage across all mine systems.

For these three scenarios, we only model the first two components of the Proposed Approach, i.e. excluding the application of a 2048 WAML for Moura. Instead, we separately model the tariff impact on Moura customers specifically from the introduction of that third component. In other words, we compare the Proposed Approach *with* and *without* the 2048 WAML which overrides the 2055 Global Economic Constraint (the **2048 Constraint** and the **2055 Constraint** approaches, respectively). For Moura specifically, we therefore model the following two scenarios:

- A **Base Case scenario**, identical to the above, but limited to Moura; and
- An **Accelerated WAML scenario**, in which usage of the network is negligible after 2048.

In each of these scenarios, we allow for the approaches to adjust to the “correct” approach for that scenario as of 2037, i.e. relaxing the 2048 Constraint back to 2055 if the Base Case scenario transpires, or accelerating the 2055 Constraint to 2048 if the Accelerated WAML scenario transpires. I.e. we don’t assume the depreciation policy is implemented on a “set and forget” basis.

For all scenarios, Aurizon has provided us with indicative estimates for both annual delivery volumes and capital expenditures. Using a range of assumptions from historical data, particularly on the physical life of new assets, we have built a model which estimates the MAR (excluding operating costs) in each year in each scenario and under each of the two capital recovery approaches. Further, we divide MAR by Aurizon’s volume estimates to show the tariff impact.

In Table 1.1 below, we synthesise the levels and differences in CQCN tariffs across the three CQCN scenarios, and averaged into four five-year undertaking periods, starting with UT6 in 2027.

---

[13] If discounted using the same WACC.

Table 1.1: Average CQCN Tariff Levels by Undertaking Period

	UT6	UT7	UT8	UT9
Base Case				
Existing Approach	4.72	4.94	4.98	5.26
Proposed Approach	4.92	5.00	4.95	5.09
Delta	0.20	0.07	-0.03	-0.17
Carbon Constrained				
Existing Approach	4.90	5.57	6.02	6.27
Proposed Approach	5.11	5.64	5.97	6.05
Delta	0.21	0.07	-0.05	-0.22
Carbon Shock				
Existing Approach	5.06	7.44	9.03	10.53
Proposed Approach	5.28	7.51	8.89	10.03
Delta	0.21	0.07	-0.14	-0.50

From the table above, we conclude the following:

- If something resembling the Base Case materialises, then we expect CQCN tariffs to be relatively stable, irrespective of the Capital Recovery Approach. While there are some minor differences in the shape of the tariff, these are unlikely to be a material concern to users of CQCN. In large part, this is a reflection of the modest nature of Aurizon's proposal.
- In all scenarios, the Proposed Approach would initially add about $0.20 to the tariff, in exchange for a much more varied savings in the tariffs in the later years. This reflects that, across scenarios, near-term demand is high and much easier to predict. As a result, the well-understood and sizeable customer base today is better able to absorb an increase in the MAR today compared to the future customer base which is highly uncertain and may prove to be much smaller.
- In the more negative cases, like the Carbon Shock scenario, tariffs increase substantially under both approaches in the final period, but by materially more under the Existing Approach. We expect that in these scenarios, further policy changes would be required to ensure that the full remaining value of CQCN is not paid for only by the few remaining customers in the few remaining years (which in any case would probably create a demand death spiral in the face of these high tariffs). We do not speculate what kind of intervention would occur, but irrespective of its precise design, it will be cheaper for billpayers and/or taxpayers if some of the asset recovery has been frontloaded in the way that Aurizon proposes.

In Table 1.2 below, we do the same for the two Moura scenarios.

Table 1.2: Average Moura Tariff Levels by Undertaking Period ($/tonne)

	UT6	UT7	UT8	UT9
Base Case				
2055 Constraint	4.83	5.23	5.83	7.40
2048 Constraint	4.84	5.65	5.50	7.08
Delta	0.01	0.41	-0.33	-0.32
Accelerated WAML				
2055 Constraint	4.83	5.69	7.77	13.39
2048 Constraint	4.84	6.13	7.29	12.68
Delta	0.01	0.44	-0.48	-0.71

From the table above, we conclude the following:

- Across both scenarios, the tariff from the 2048 Constraint is virtually identical to that from the 2055 Constraint during UT6, higher in UT7, and lower in UT8 and UT9.
- If something resembling the Base Case materialises, then we expect tariffs to be relatively stable, though increasing in UT9 as the Global Economic Constraint approaches. Even though it is not the "correct" approach given the continued use of the Moura network in the Base Case, the 2048 Constraint actually produces a more stable price path, as it moderates some of the increase in UT9.
- If something resembling the Accelerated WAML scenario materialises, then tariffs will increase significantly under either policy design, but less so with the 2048 Constraint. In this case, the tariff reductions during UT8 and UT9 and larger than the tariff increase in UT7, relative to the 2055 Constraint tariffs.

Across both of the above tables, it is not possible to know at this stage which path/scenario of the above (or any other) we are on, but the Proposed Approach produces better outcomes for customers across all of these scenarios:

- Even in an outlook of enduring use of CQCN (i.e. Base Case conditions), a modest frontloading of revenues would not materially harm customers today. In fact, in every single case we model, the accelerated depreciation that Aurizon proposes (including the 2048 Accelerated WAML) serves to flatten tariffs that would otherwise increase under the Existing Approach. In no case does the Proposed Approach produce *decreasing* tariffs over time, which could be a sign of a policy that goes too far to accelerate depreciation. Thus, even under Base Case conditions, the Proposed Approach produces a more stable and predictable tariff path than the Existing Approach, and which may be preferable to Aurizon's customers (particularly those which operate on longer time horizons).
- On the other hand, in an outlook of rapidly declining use of the network, the Proposed Approach could substantially reduce the burden faced by the few remaining users of the service and/or mitigate the costs investors in the rail network could be required to bear if assets are stranded.

Thus, we conclude that the Proposed Approach is a pragmatic approach to dealing with the uncertain outlook of CQCN, with limited material downsides.

1.5. Roadmap of Report

The remainder of this report proceeds as follows:

- In Section 2, we set out the relevant regulatory background and history on Aurizon's network;
- In Section 3, we discuss the supply and demand dynamics for the Central Queensland coal export industry, and how its outlook could impact Aurizon's operations;
- In Section 4, we discuss common approaches to mitigate stranding risk and how regulators in Australia, the UK, and New Zealand have approached regulation under demand uncertainty;
- In Section 5, we describe our approach for modelling the impacts of this uncertainty on revenues and tariffs; and
- In Section 6, we provide our detailed results and conclude.

2. Regulatory Background

2.1. Overview of Regulatory Regime

Aurizon Network is a wholly owned subsidiary of Aurizon Holdings Limited, which was privatised in November 2010 and manages Australia's largest coal export rail network, the Central Queensland Coal Network.[14] Economic regulation of these services commenced in 1998.

The CQCN is declared for third-party access in accordance with Part 5 of the Queensland Competition Authority Act 1997 (**QCA Act**),[15] and Aurizon must allow third-party train operators to use its network. Aurizon's assets in the CQCN are subject to access arrangement regulation, whereby Aurizon submits semi-regular access undertakings to the QCA for approval. Each undertaking sets out the terms under which Aurizon provides access to the CQCN, including Aurizon's MAR and the prices for access to the declared service. If the QCA does not approve Aurizon's proposed undertaking, Aurizon must revise the undertaking in line with the QCA's recommendations. The next access arrangement term, UT6, is due to begin in July 2027.[16]

Under Part 5 of the QCA Act, the QCA must ensure the access arrangement, among other matters;

- promotes 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,[17]
- provides Access Seekers with information on the efficient costs and price of providing the service, including the value of the assets being used;[18] and,
- provides an access price that generates 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.[19]

Consistent the common regulatory practice, the MAR for each access arrangement is based on a "building blocks" approach, which allows for recovery of efficient costs, including a nominal WACC return on the RAB. The MAR is the sum of four components:

- Operating costs: annual expenses dedicated to the operations and maintenance of the network;
- Depreciation: the gradual recovery of the principal costs of capital assets over the deemed life of those asset lives (sometimes referred to as the return *of* capital);

---

[14] QCA, "Aurizon Network", accessed 19 August 2025, https://www.qca.org.au/project/aurizon-network/

[15] Queensland Treasury, Queensland Competition Authority Act 1997 – Current as at 1 March 2023, ("QCA Act").

[16] Previous periods have varied in length from four to ten years, but we understand that they will now follow a five-year cycle going forward.

[17] QCA Act, section 69E.

[18] QCA Act, section 101(2).

[19] QCA Act, section 168A(a).

- Return *on* capital: the financing costs relating to those same capital assets, in between when they are added to the RAB and when the principal costs are recovered through the depreciation element; and
- Tax Allowance: taxes are modelled in the cash flows with imputation adjustment.

The RAB is subject to roll-forward arrangements whereby the RAB is rolled forward each year for:[20]

- new prudent and efficient capital expenditure,
- the capitalisation of inflation of the opening RAB and capital additions;[21]
- depreciation of the opening RAB and capital additions using the QCA endorsed lives; and
- asset disposals reflecting net proceeds on disposal.

The QCA can adjust values of assets within the RAB as required, including where they find that demand for a service utilizing an asset has substantially fallen and that this will be sustained long term.

2.2. History of Aurizon Network's Regulatory Depreciation

Both the capital recovery period and the individual asset capital recovery rates are subject to periodic review during each undertaking submission process. Since 2001, the CQCN depreciation policy has been subject to various reviews and adjustments in the five undertakings that have been approved by the QCA.

In 2001 when UT1 was enacted, the CQCN was managed by Queensland Rail (**QR**). UT2 was enacted in 2006 and again in 2008 after QR withdrew the 2006 undertaking due to a corporate restructure which made QR Network a new independent subsidiary responsible for owning and managing QR's below-rail assets and services. UT3 was enacted in 2010, and shortly afterwards QR Network privatised under its current name of Aurizon Network. UT4 was enacted with Aurizon as the network operator in 2016 and shortly after, UT5 was enacted in 2017.

In the first undertaking (UT1), the QCA accepted that depreciation should be based on the shorter of the economic and physical life of the assets,[22] i.e., the useful life of the asset. However, given a lack of information to support an assessment of economic life, the physical life was adopted as the standard. In making its decision, the QCA agreed that, in subsequent review periods, more definite and reliable information regarding mine lives and future industry development should be considered as it becomes available.[23]

In UT2 the QCA rejected proposals by QR to reduce the economic life of the Newlands coal systems and the Wotonga to Blair Athol branchlines to align with the expected production lives of the mines using those assets. However, the QCA accepted that accelerated depreciation is a legitimate means of mitigating asset stranding risk if there is evidence of a material change in risk.

[20] Aurizon Network Pty Ltd, The 2017 Undertaking, p.398.

[21] Note, the value of the RAB increase coming from inflation is deducted from each year's MAR to ensure that Aurizon is not compensated for inflation twice.

[22] Economic life as determined by the life of the mines that the supports the rail infrastructure.

[23] Queensland Rail, Submission accompanying QR's Draft Access Undertaking, October 2001, p.107.

In addition, the QCA considered there was sufficient justification to apply a 50-year remaining life to assets with remaining lives exceeding 50 years due the 2055 economic life constraint found by Energy Economics during the 2005 Dalrymple Bay Coal Terminal (DBCT) undertaking.[24] The 2055 economic life constraint stemmed from Energy Economics' findings that:

- At current extraction rates, the Bowen Basin coal reserves had an economic life of 49.8 years; and,
- The market position beyond 50 years was highly uncertain due to potential future steel substitutes, alternative energy sources, carbon taxes and more.[25]

In its UT3 proposal QR Network proposed further adjustments to the depreciation arrangements to reduce stranding risk in response to the size of its proposed capital expenditure over the UT3 regulatory period.[26] QR Network proposed to reduce the economic life of investments made after 1 July 2009 to a fixed life of 20 years. However, this was not accepted by the QCA. Instead, the QCA recommended that a rolling 20-year life be applied (**Rolling 20**). This meant that:

- During the UT3 period, a 20-year maximum asset life would be applied to investments made after 1 July 2009; and,
- In each subsequent undertaking, new assets and assets which had their useful lives capped at 20 years in previous undertakings would have depreciation calculated based on the lesser of their remaining useful life or 20 years.[27]

For UT4, Aurizon proposed for assets to be depreciated on a straight-line basis over the lesser of the weighted average mine life (**WAML**) of 25 years or the remaining QCA-endorsed physical life of the asset.[28] This proposal was consistent with the approach to depreciation taken in the Hunter Valley Coal Network. The QCA's consultant, RSM Bird, supported this approach noting:

> *"on the basis that Aurizon Network is not compensated for the risk of additional marketable reserves being not being discovered and assets becoming stranded, we consider adoption of an amended maximum economic life of assets based on the mid-point of the average mine lives weighted by marketable reserves and production rates does not appear unreasonable".*[29]

However, the QCA did not support the proposal on the basis that they were unconvinced of a material change in asset stranding risk and favoured retaining the UT3 approach for regulatory

---

24 QCA, QR's 2005 Draft Access Undertaking – Draft Decision, July 2005, pp.61-63; QCA, QR's 2005 Draft Access Undertaking – Final Decision, July 2005, pp.61-62.

25 QCA, Dalrymple Bay Coal Terminal Draft Access Undertaking – Final Decision, April 2005, p.133.

26 QR Network proposed $1.35 billion of capital expenditure representing around 42% of the opening asset value for the UT3 regulatory period.

27 QCA, QR Network 2009 Draft Access Undertaking – Draft Decision, December 2009, p.36.

28 QCA, Aurizon Network 2014 Access Undertaking – Volume IV – Maximum Allowable Revenue - Final Decision, April 2016, pp.194.

29 RSM Bird Cameron, Aurizon Network 2013 Draft Access Undertaking Financial Assessment of Operating Expenditure, January 2014, p.82.

predictability and stability. In addition, the QCA considered that the existing depreciation approach adequately dealt with the level of asset stranding risk.[30]

Prior to the UT5 proposal, the QCA commissioned RMI to prepare an updated independent mine life analysis for the DBCT catchment, as part of its assessment of the 2015 DBCT Draft Access Undertaking. This assessment confirmed the previous economic life constraint of 2055 from UT2.[31] Given the confirmation that the previous assessment of economic life remained appropriate, the QCA's views on standing from the UT4 process, and the immaterial amount of time between approval of UT4 and lodgement of UT5,[32] Aurizon's proposal for UT5 retained the depreciation policy arrangements developed in UT3.

At present, therefore, the current depreciation policy is as follows:

- *Assets which were in the RAB before July 2009* are assumed to depreciate on a straight line basis over the shorter of (a) physical life of that specific asset, or (b) the time remaining until the Global Economic Constraint of 2055.[33]
- *Assets which are subsequently included in the RAB after July 2009* depreciate according to the Rolling 20 method, subject also to the time remaining until the Global Economic Constraint of 2055.

2.3. The Nature of Aurizon's Existing Asset Base

The CQCN is comprised of over 2,670 kilometres of heavy haul railway track, linking more than forty mines to five coal export terminals across four major Coal Systems (namely, Newlands, Goonyella, Blackwater and Moura) and the Goonyella to Abbot Point Expansion (**GAPE**), which connects the Goonyella and Newlands Coal Systems.

As Table 2.1 below shows, Aurizon's assets in the Blackwater and Goonyella system made up the majority of its closing RAB in FY24, followed by its assets in GAPE, Moura, and Newlands. In Figure 2.1 below, we show the extent of Aurizon's rail network.

Aurizon's RAB is comprised of physical infrastructure, such as tracks, signaling and communication systems, and terminals and loading facilities. Supporting facilities include maintenance depots and operational equipment.

Valuations of railway infrastructure assets are based upon a Depreciated Optimized Replacement Cost (**DORC**) methodology, which reflects the maximum value of an asset if it were to be traded in a competitive used asset market.[34]

---

30 QCA, Aurizon Network 2014 Access Undertaking – Volume IV – Maximum Allowable Revenue - Final Decision, April 2016, pp.197-198.

31 RMI, DBCT 2015 DAU Review of the Economic Life of DBCT Assets – Final Report, December 2015.

32 The 2014AU was eventually approved by the QCA on 11 October 2016. Aurizon Network was also required to submit a mandatory draft access undertaking for the UT5 period no later than 30 November 2016.

33 The Global Economic Constraint assumes that value of the assets in the RAB will be fully written down to zero by 2055 irrespective of the remaining physical asset lives. In practice, it would be expected this life would be reviewed to reflect trailing demand beyond 2055 as that date approaches.

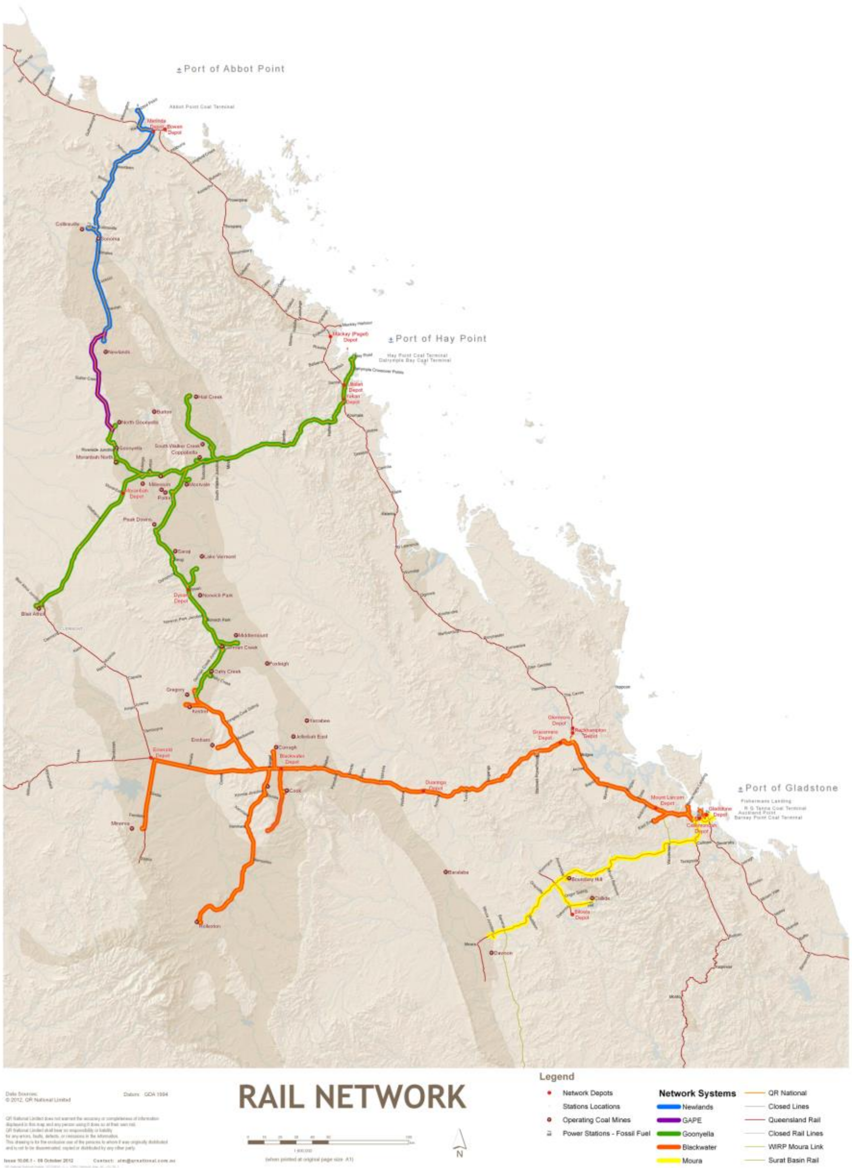
34 Aurizon, Arc Infrastructure Proposed Costing Principles, Submission to ERA,6

Table 2.1: Aurizon CQCN Closing RAB by System in FY24

System	Actual closing RAB ($000s)	% of total RAB
Blackwater	$2,757,267	45%
Goonyella	$1,952,171	32%
Moura	$366,142	6%
Newlands	$347,220	5%
GAPE	$730,992	12%
Total	**$6,153,792**	**100%**

Source: Aurizon, Central Queensland Coal Network - 2023/24 RAB roll-forward Report as of 30 June 2024.
Notes: Includes electric and non-electric.

Figure 2.1: Aurizon's Service Territory



3. Demand Outlook for Aurizon Network

As the network provider that connects the Central Queensland mines to the coastal coal export ports, the outlook for the usage of Aurizon's network depends on the longer-term outlook for the viability of the Central Queensland mines themselves. This outlook itself faces risks on both the demand side (e.g. a change in global coal markets) and the supply side (reduced productions from these specific mine regions, either for physical or regulatory reasons).

In this section, we describe the nature of the coal industry in Queensland and globally insofar as it concerns the exports from Queensland. In particular, we focus on how supply and demand dynamics for Central Queensland coal creates uncertainty around the future use of Aurizon's network, and how this uncertainty has increased in the years since the last undertaking was decided.

3.1. Background on Queensland Coal

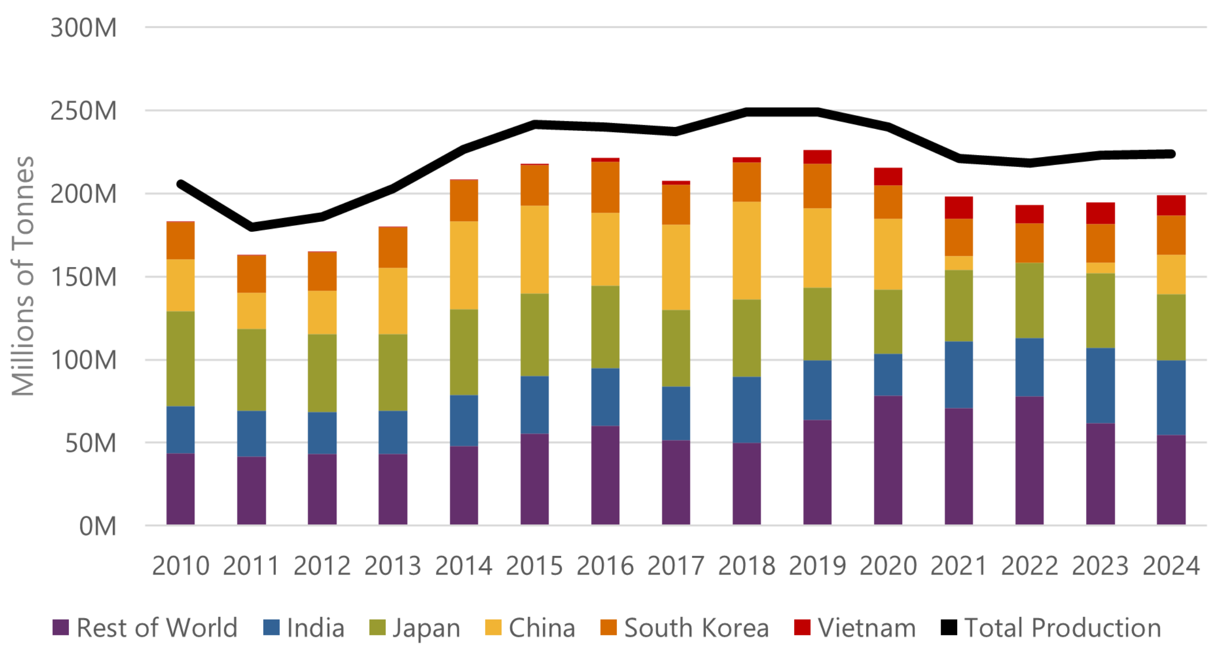
Queensland primarily produces metallurgical coal (primarily used for steel production), with 60% of its production made up of metallurgical coal, and the remaining 40% thermal coal (i.e. for electricity generation). Around 89% of Queensland's coal is exported with 67% of this being metallurgical coal and 33% thermal. Hence, Queensland is greatly dependent on global demand for coal, particularly metallurgical coal.

Most of Queensland's exports (72% as of FY 2024) go to countries in the Asia Pacific such as India, Japan, China, South Korea, and Vietnam. These countries are generally among those who consume the most coal worldwide.[35] Beyond the Asia Pacific region, Queensland exports all over the world, to 38 countries overall across Asia, Europe, South America, and Africa in FY2024.

Since Aurizon's previous Access Undertaking in 2017, Queensland's production and exports have fallen by around 6% and 4% respectively, though they have been steady since 2021 (see Figure 3.1). The majority of this production drop off has come from the Goonyella and Blackwater systems, the two largest systems in which Aurizon operates. Production in the Newlands system has more than doubled since 2017, but this increase has not been sufficient to match the declines in the other systems given Newland's relatively smaller production size (see Figure 3.2).

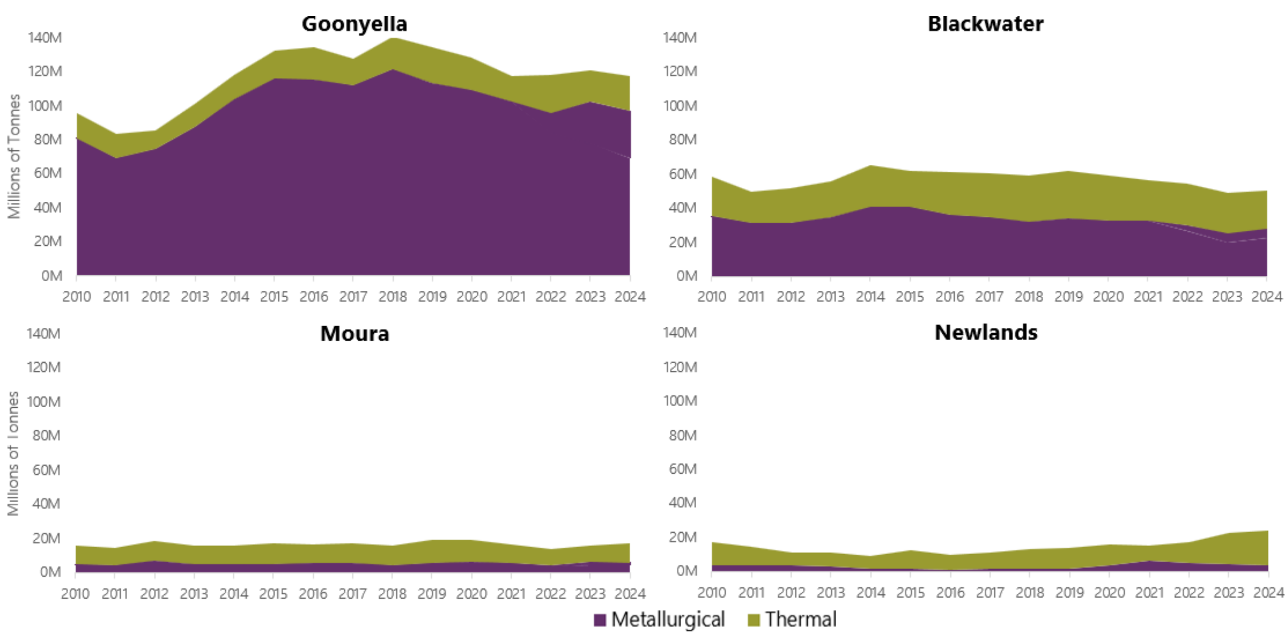
[35] In 2023 China was the largest user of coal burning 3469mt. India was second burning 721mt. Japan and South Korea burned 151mt and 121mt respectively, below the USA (284mt), Indonesia (220mt), EU (188mt), and Russia (197mt). Vietnam was the second largest consumer in Southeast Asia after Indonesia burning 96mt. IEA, Coal 2024 – Analysis and forecast to 2027, December 2024, ("2024 IEA Coal"), p.34; IEA, World Energy Outlook 2024, October 2024, ("2024 IEA WEO"), p.318.

Figure 3.1: Queensland Total Coal Production and Exports by Country



Source: NERA analysis from Queensland Government annual coal statistics. https://www.data.qld.gov.au/dataset/annual-coal-statistics

Figure 3.2: Coal Production by Mines within Coal Systems



Source: NERA analysis from Queensland Government annual coal statistics.
Notes: Production is allocated to coal systems based on which system the mine originates. Moura includes non-railed thermal production from the Callide which is consumed by the Callide Power Station.

3.2. Outlook for Coal Demand

3.2.1. Global Demand for Coal

The outlook for global coal demand, and demand for Queensland coal in particular, is uncertain. Global coal demand is projected to fall from 2030 onward, but the speed and timing of this decline depends on several uncertain factors such as the strength of global climate action, future weather conditions, geopolitical issues, and technological advancement (such as steel production alternatives).

The unpredictability of forecasting future demand has become especially apparent over the last half decade with numerous unforeseen events such as the Covid-19 pandemic, Russia's war in Ukraine, and unprecedented weather conditions resulting in high volatility in demand.[36]

The International Energy Agency (**IEA**) publishes long-term forecasts each year on the global outlook for coal demand based on three climate action scenarios:[37]

- Stated Polices (**STEPS**): shows the evolution of the market with current policies.
- Announced Pledges (**AP**): assumes climate targets and deadlines are met in all energy areas. Effectively represents current global potential.
- Net Zero Emissions (**NZE**): assumes that global net zero CO2 emissions are achieved by 2050.

Figure 3.3 below shows the IEA's forecast for 2024. This forecast demonstrates the widening uncertainty of coal demand as we look further in the future. By 2035, depending on the strength of global climate action, global demand might range from 4.5 down to 1.7 billion, representing a 26% to 71% decrease in demand relative to 2023 levels. This is similarly the case for the 2050 forecast which ranges from a 47% to 92% decrease in demand relative to 2023 levels. Moreover, these scenarios do not account for the many permutations of climate and geopolitical effects which can also have a significant impact on demand.[38]

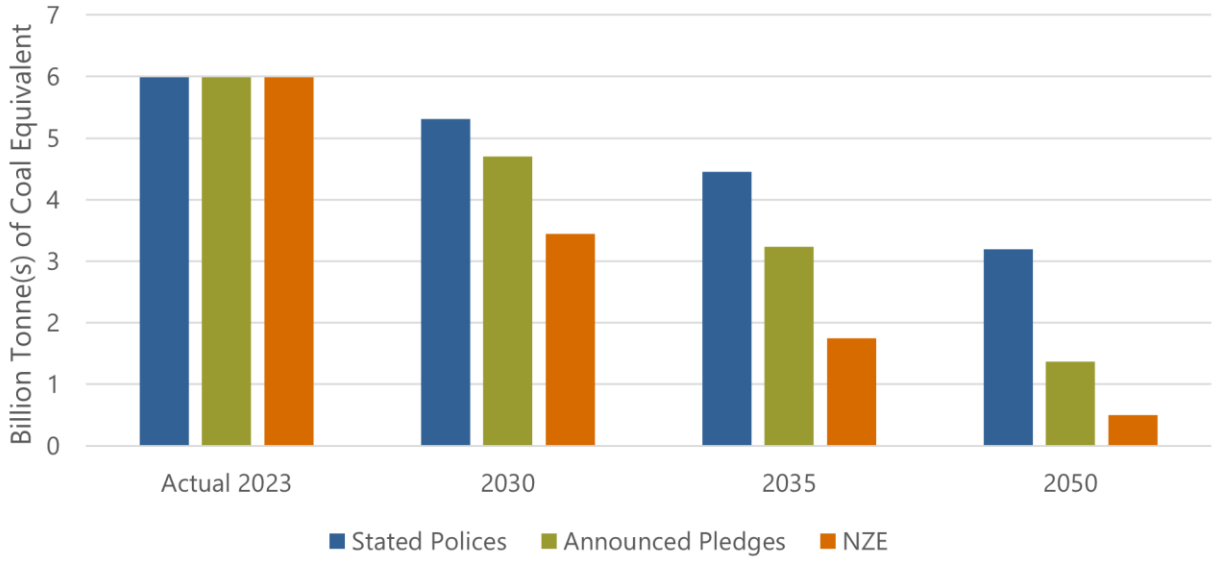
---

36 2024 IEA WEO, p.149.

37 2024 IEA WEO, p.78.

38 Each scenario evolves mainly due to variations in the assumptions made about how government policies develop, and how these variations affect the investment and technology choices made by households and firms. 2024 IEA WEO, p.78.

Figure 3.3: IEA 2024 Global Demand Outlook



Source: NERA analysis from 2024 IEA forecast.

Figure 3.4 below shows the IEA's global demand forecast in 2017 alongside their 2024 forecast. Since the IEA's three scenarios differ between their 2017 and 2024 forecasts, we categorise the scenarios as high, medium, and low demand scenarios.[39]

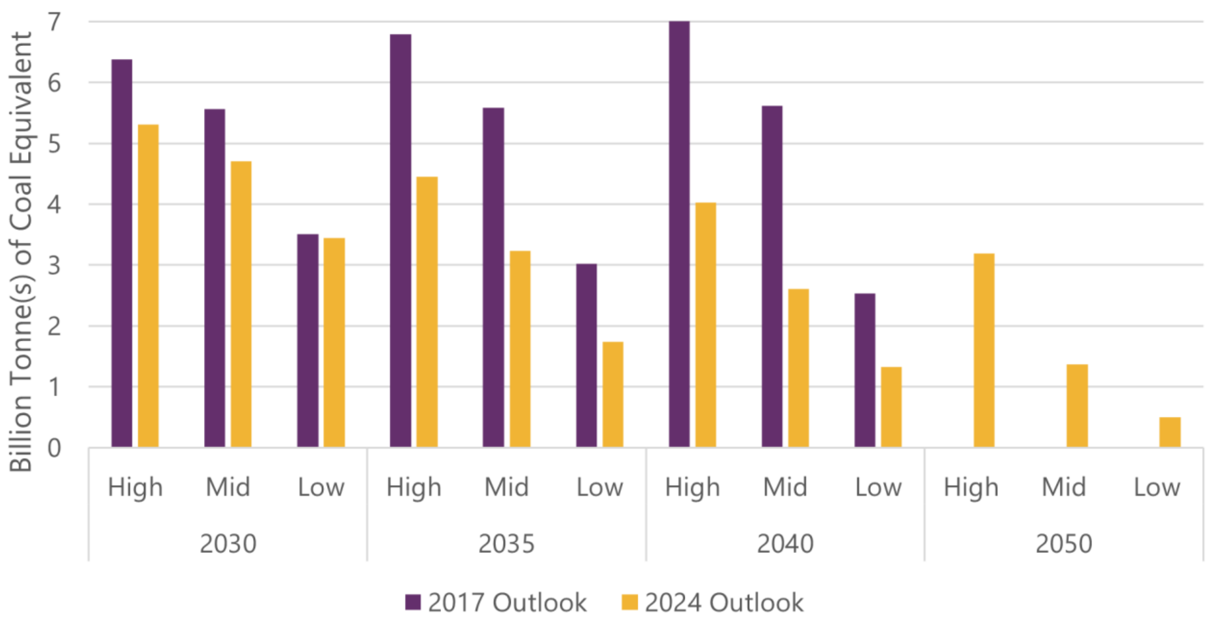
This figure demonstrates three trends:

- Predicted global demand for coal has declined significantly since Aurizon's previous access arrangement was determined in 2017;
- There is considerable uncertainty in predicting future coal demand. In just seven years, predicted global demand has fallen by 11% for 2030, 40% for 2035, and 48% for 2040;[40] and
- In both the 2017 and the 2024 Outlooks, there is considerable variability between the High and the Low cases, especially in later years. While the 2024 Outlook foresees declining global coal demand in all scenarios, in the High case the 2050 values are over half of the present day values, while in the Low case it falls to 0.5 billion.

[39] The 2017 scenarios are as follows, High – Current Policies: only considers policies enshrined in legislation as of mid-2017, Mid – New Polices: current polices and official targets and plans, Low – Sustainable Development: the world collectively achieves the goals it set on climate change, air quality and access to energy. IEA, World Energy Outlook 2017, November 2017, ("2017 IEA WEO"), pp.37-39.

[40] Calculated as the average percentage decrease between each equivalent scenario.

Figure 3.4: IEA Global Demand Outlook 2017 vs 2024



Notes: The IEA's three scenarios differ between their 2017 and 2024 forecasts. For 2024 High = STEPS, Mid = APS, Low = NZE. The 2017 forecast for 2035 is the linearly interpolated value between the 2030 and 2040 forecast. The 2024 forecast for 2040 is the linearly interpolated value between the 2035 and 2050 forecast.
Source: NERA analysis from 2017 IEA WEO forecast and 2024 IEA WEO forecast.

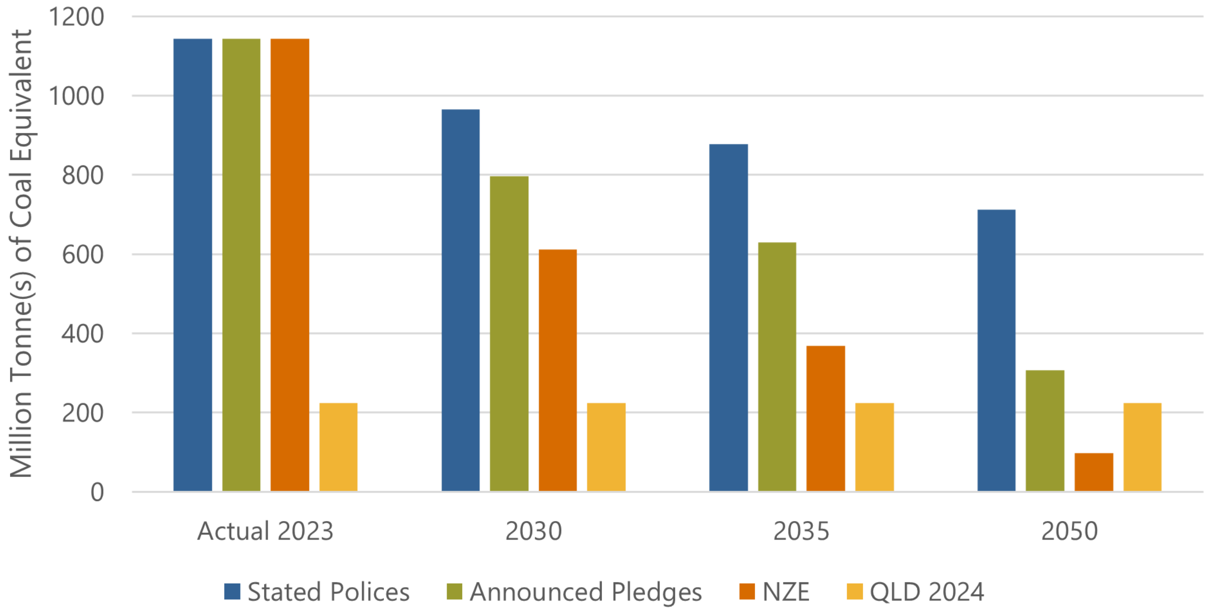
It is uncertain how this decrease in global demand will impact the demand for Queensland coal specifically. Most global coal is produced and consumed domestically, hence demand for foreign coal is much smaller than global demand as a whole.

As Figure 3.5 below shows, total Queensland 2024 coal production made up the equivalent of 20% of global coal exports in 2023.[41] By 2050, the IEA's AP and NZE forecasts predict that there is a risk of there being close to or even less global coal exports than what Queensland produced in 2024. Hence, the future demand for Queensland coal greatly depends on where it falls in terms of competitiveness with other sources of coal exports. For example, if coal from Queensland were the cheapest (including transportation costs) among all exporting regions, then its exports would not be impacted until global demand for imported coal fell below what it currently exports.

We understand that Queensland is a relatively low-cost region in the global supply stack for coal exports, so it is probable that exports would not be substantially affected by minor decreases in global demand for imported coal. If global demand drops substantially, we would expect that some of the more expensive mines in Queensland could become uneconomic, reducing demand for the usage of the CQCN. We do not focus further on the economics of individual mines as part of this report.

41 Queensland's actual exports in 2023, rather than production, made up 17% of global exports.

Figure 3.5: IEA 2024 Global Coal Trade Relative to Queensland Production



Notes: The QLD bar represents Queensland's actual coal production in FY2024. The data for these bars comes from the Queensland Government annual coal statistics rather than the IEA.
Source: NERA analysis from 2024 IEA WEO forecast

The 2024 IEA forecasts predict Australia's coal production as a whole to fall by a range of 29% to 95% by 2050 depending on the scenario (See Table 3.1 below). This is a significant change from the IEA's 2017 forecasts which predicted an increase in Australian coal production through 2040 in its Mid (new polices scenario). The 2017 report did not publish forecasts for Australia for its other scenarios. However, it forecasted an increase in production in the Asia Pacific region under its High (current policies) scenario and a 47% decrease under its Low (sustainable development) scenario by 2040.

Table 3.1: 2024 IEA Forecast of Australian Coal Production

Scenario	2035	2050
STEPS	-23%	-29%
APS	-46%	-82%
NZE	-69%	-95%

Source: Estimated from Figure 3.39 in 2024 IEA WEO, p.151.

3.2.2. Outlook for Metallurgical Coal

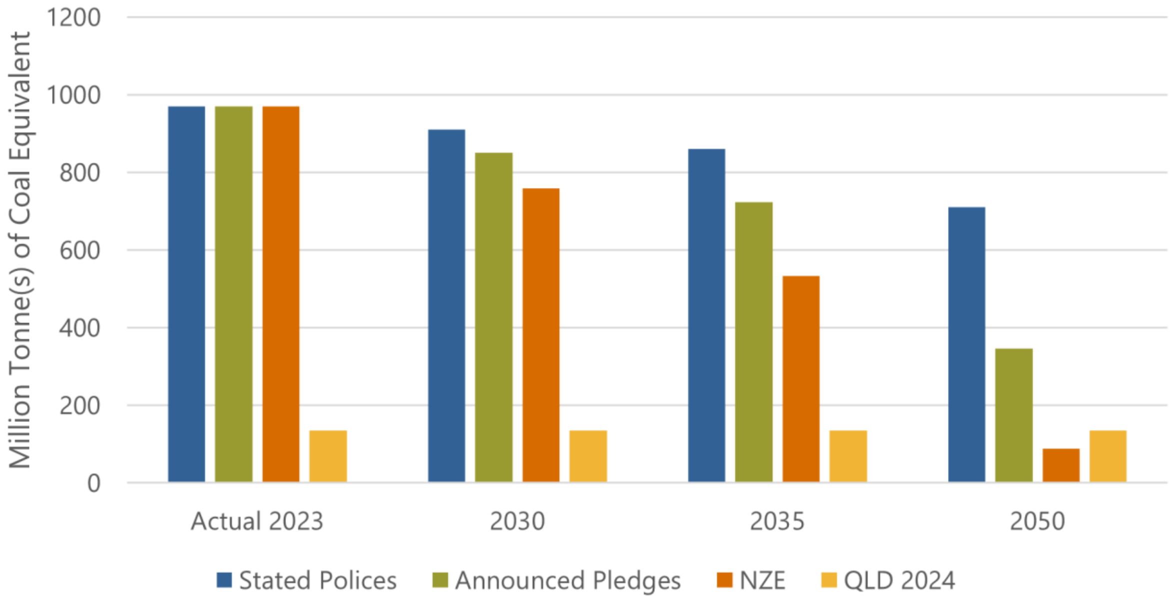
Given that Queensland primarily produces and exports metallurgical coal which is used in steel making, global demand for metallurgical coal is relatively more important for Queensland.

Figure 3.6 below shows the IEA's 2024 forecast of global metallurgical coal production alongside Queensland's actual metallurgical coal production in FY2024. Since production is linked to demand, we can use this forecast as a proxy for global metallurgical coal demand.[42]

In 2023 Australia was responsible for 45% of global metallurgical coal exports,[43] around 90% of which was from Queensland.[44] As the figure shows, Queensland's production currently makes up a significant portion of global metallurgical demand (~14%). In addition, global demand for metallurgical coal is forecasted to decrease significantly less than for thermal coal (18% vs. 42% by 2035, 46% vs. 67% by 2050)[45] since there are fewer alternatives for steel making.[46]

This suggests that Queensland remains relatively well placed over the longer term compared to jurisdictions that are more reliant on thermal coal production and exports. However, under the NZE scenario, global metallurgical coal demand is less than current Queensland production by 2050. In addition, since this figure shows forecasted production rather than trade, it is likely that the demand for global metallurgical coal exports will be much lower. Furthermore, the Moura and Newlands systems which rely more on thermal coal production may be impacted more than other Coal Systems.

Figure 3.6: World Metallurgical Coal Production Outlook vs Current QLD Metallurgical Coal Production



42 The 2024 IEA WEO production forecasts align with their demand forecasts. See p.149.

43 2024 IEA WEO, p.151.

44 Queensland exported 136mt of Met coal in FY23 and Australia exported 148mt of Met coal in CY23. Queensland Government annual coal statistics; The Coal Trader, "Australian coking coal exports fall 4% YoY in 2023", accessed 12 August 2025, https://thecoaltrader.com/australian-coking-coal-exports-fall-4-yoy-in-2023/

45 Calculated as the average percentage decrease in the STEPS and APS scenario. If the NZE scenario is included, would be 27% vs. 53% by 2035, 61% vs. 75% by 2050. Production forecasts rather than demand are used since the IEA did not publish demand by coal type.

46 2022 IEA WEO, p.410.

Source: NERA analysis from 2024 IEA WEO forecast.

3.2.3. Risks with Specific Export Markets

It is also important to consider the demand outlook for Queensland's traditional export markets. Under the IEA 2024 STEPS and APS scenarios, 82% to 85% of all global coal is expected to be consumed in the Asia Pacific by 2050, where Queensland currently exports the majority of its coal, relative to 82% in 2023.[47] However, predicting the demand of Queensland coal specifically can be challenging as demonstrated by the recent unexpected policy outcomes from China, currently the world's largest importer of coal.

Recent political disputes between China and Australia led to a two-year unofficial ban on Australian coal imports resulting in a 16% and 20% decrease in Queensland coal exports in 2021 and 2022 relative to 2020 volumes.[48] Coal trade with China did rebound in 2024 but has not yet returned to pre-2021 levels. This is a result of a strengthening partnership between China and Mongolia for metallurgical coal which may diminish Australia's coal trade with China in the near future.[49] This is a prime example of the unpredictability of country specific demand for Queensland coal.

Queensland coal is likely to remain in demand by India over the coming decades as renewable and domestic coal struggle to keep up the increasing population, steel production, and energy needs. The IEA's STEPS scenario expects India's coal use to increase in power generation to 2030 and in industry to 2050, with its energy-related CO2 emissions estimated to peak around 2035.[50] Japan and Korea on the other hand have decreasing populations and are investing heavily in renewables and nuclear power with the goal of phasing out coal-fired power plants in the 2030s. Yet, a slower decline is expected for metallurgical coal demand, driven by the dynamics of the steel sector.[51]

Domestically, AEMO's forecast for coal electricity generating capacity has fallen significantly between the 2018 Integrated System Plan (ISP) and the 2024 ISP. The 2024 "Step Change" case, which AEMO treats as its baseline scenario, shows a complete retirement of Australian coal power generation capacity by 2038. There is also more variability between the various AEMO scenarios when compared against the 2018 scenarios where the AEMO's forecasts differed little from each other. However, given that Queensland exports nearly all its coal, this is likely to have a small effect relative to changes in global demand.

---

47 2024 IEA WEO does not a regional breakdown for its NZE scenario.

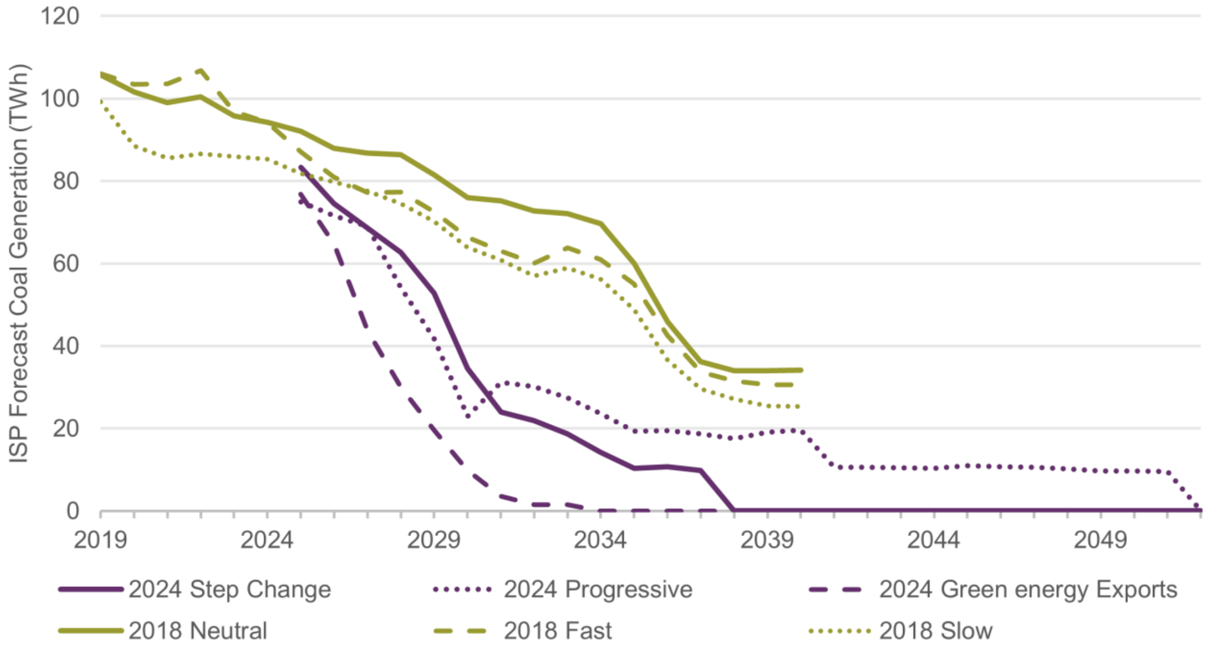
48 Figures calculated using data from Queensland Government annual coal statistics; "China's 2023 coal imports from Australia rise, but below pre-ban era", Reuters, 22 January 2024, Ch

49 Chinese demand for Australian coking coal has fallen with Mongolia becoming the second largest exporter of metallurgical coal in 2024. A new cross-border railway between China and Mongolia set to be completed in 2027 has the capacity to increase Mongolian coal transport capacity from 83 to 165m/t per year, which has potential to further disrupt demand from the Australian market. IEA, Coal Mid-Year Update 2025; "Mongolia to issue tenders for new railway to boost coking coal exports to China", S&P Global, 18 March 2025, https://www.spglobal.com/commodity-insights/en/news-research/latest-news/metals/031825-mongolia-to-issue-tenders-for-new-railway-to-boost-coking-coal-exports-to-china

50 IEA WEO 2024, p.150.

51 IEA Coal 2024, pp.36-37; 2024 IEA WEO pp.282-283.

Figure 3.7: AEMO ISP Black Coal Generation Forecasts 2024 vs 2018



Notes: Brown coal is excluded given that it is not transported long distances.
Source: NERA analysis for AEMO 2018 and 2024 ISP forecasts.

Given the variability in outlook for global and domestic coal demand and the considerable change in outlook relative to 2017, Aurizon appears to be facing considerably more long-run volume risk for its coal carrying train services today than around the time of its previous access review in 2017.

3.3. Risks to Coal Supply

On the other side of the equation, we consider the risks to the demand for the CQCN coming from the supply within the Central Queensland mine regions.

A key supply risk stems from the Moura System, whose economic life constraint has not been subject to a detailed review and is therefore uncertain. The supply risk in the Moura System is particularly prominent given that:

- There is no interconnectivity with other Coal Systems. Thus, a reduction in supply could not be offset by the rerouting of trains originating in another Coal System; and,
- There is a small number of operational coal mines with the Coal System with the majority of throughput coming from two coal mines.[52] Thus, a reduction in supply would have a larger relative impact on the access charges required from remaining producers.

[52] The Moura system currently has three operating coal mines, Dawson complex, Baralaba North Mine and Callide. The Baralaba mine is no longer producing coking coal and is expected to cease production by 2035. The Baralaba South project is expected to commence in 2036 to coincide with the closure of the Baralaba North pit. This mine is expected to produce only low-volatile matter PCI coal over its expected life. Source: information provided by Aurizon.

Hence, if mine life in the Coal System does not match the current economic life constraint of 2055, there would likely be a considerable negative effect on coal producers in the system and on the viability of the Moura System.

In general, the production of coal has become increasingly unpopular domestically among investors and the general population due to carbon emissions created from the use within coal fired power plants. The production of coal has not yet been significantly hindered by government policy intervention since Australia's net zero climate goals do not apply to its exports.[53] However, there is risk that the Australian government could increase the requirements or even cease the approvals for new coal mines or mine extensions.

Further environment policy such as the reform of the Safeguard Mechanism in 2023 which requires industrial facilities emitting more than 100,000 tonnes of carbon dioxide equivalent per year to reduce emissions by 4.6% each year, could also challenge the viability of new and existing mines.[54]

Queensland has not yet shown any indication of ceasing the approval of new projects having approved several new mines in 2024.[55] There are also at least 16 new Queensland coal mines currently waiting on either state or federal government approval.[56] In addition, the Queensland Government is also considering a streamlining of the land release process which will speed up the time it takes to gain approval for on-ground exploration for resource projects.[57]

In addition to the potential risk of regulatory changes, there is a high degree of risk that existing and future mines, particularly thermal coal mines, will not have access to reasonable finance and insurance, both of which are essential in coal mining to manage risk and to fund the extensive capital required.

In 2021 the Australian Parliament Joint Standing Committee on Trade and Investment Growth performed an inquiry into prudent regulation in Australia's major export industries, in particular coal mining. During this inquiry industry participants raised substantial concerns regarding future access to reasonable finance and insurance.

The world's largest investment funds now expect banks to assess and act on climate-related risks and large investors are increasingly committed to net zero portfolios by 2050.[58] Hence, investors globally and domestically are increasingly wanting to shift away from thermal coal in particular.

Westpac expects banks that have committed to the Paris Agreement to continue to reduce their exposure to sectors that are not aligned with a pathway to a net zero economy as a way to

---

53 However, Australia is still bound by the Paris Agreement which is in regard to global emissions.

54 Safeguard Mechanism, Australian Government, accessed 5 August 2025, https://www.dcceew.gov.au/climate-change/emissions-reporting/national-greenhouse-energy-reporting-scheme/safeguard-mechanism

55 See "Albanese government approves three more massive coal mine expansions", Environmental Justice Australia, 20 December 2024 https://envirojustice.org.au/press-release/albanese-government-approves-three-more-massive-coal-mine-expansions/

56 "Coal Mine Tracker", The Australia Institute, accessed 5 August 2025, https://australiainstitute.org.au/initiative/coal-mine-tracker/

57 Streamlining the land release process, Queensland Government, accessed 5 August 2025, Streamlining the land release process | Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development

58 Joint Standing Committee on Trade and Investment Growth – Parliament of Australia, The Prudential Regulation of Investment in Australia's Export Industries, December 2021, ("Prudential Regulation of Investment in Australia's Export Industries"), paras 3.55-3.56.

mitigate against the potential for growing credit defaults. Transition risk—the disruption to business from the adjustment to a low-carbon economy, including changing policies, not only from Australian governments but from those around the world, is a key risk that banks are looking to avoid.[59]

In response to climate risk and investor expectations the four major Australia banks have all announced plans to exit or restrict financing to customers involved in coal-fired power or thermal coal operations:

> *Australian and New Zealand Banking Group (ANZ) and the Commonwealth Bank of Australia (CBA) have committed to exiting direct financing of coalfired power plants and thermal coal by 2030. Westpac Banking Corporation (Westpac) announced that, by 2030, it will stop lending to companies that derive more than 25 percent of their revenue from thermal coal, while the National Australia Bank (NAB) is committed to zero financing of thermal coal by 2035. Investment bank Macquarie Group will stop financing coal projects by 2024.*[60]

Likewise for insurance there is a trend globally for insurance companies to stop insuring coal projects. DISER also noted a similar trend domestically:

> *[...] many domestic insurance companies are announcing plans to limit insurance products to the sector, in particular to the thermal coal industry, with a view to ceasing the service offering altogether over the next 10 to 20 years. Insurance Australia Group, GBE and Suncorp have all announced plans to phase out underwriting new thermal coal projects and coal power stations between now and 2030.*[61]

The Bloomfield Group also advised that 'most major insurers and re-insurers are no longer willing to insure coal mines.[62] Indeed, several submissions to the inquiry expressed difficulties in securing insurance.[63]

In addition to access, the cost of insurance has increased considerably. Industry participants submitted that insurance premiums across the industry had increased 'up to 600 per cent'.[64]

While struggles to access appropriate finance and insurance is not currently a uniform experience across the sector,[65] there is risk that providers domestically and globally will continue to restrict access to these essential services in the future.

---

59 Prudential Regulation of Investment in Australia's Export Industries, paras 3.10, 3.52.

60 Prudential Regulation of Investment in Australia's Export Industries, para 3.9.

61 Prudential Regulation of Investment in Australia's Export Industries, para 3.68.

62 Prudential Regulation of Investment in Australia's Export Industries, para 3.70.

63 Prudential Regulation of Investment in Australia's Export Industries pp.47-48.

64 Prudential Regulation of Investment in Australia's Export Industries, para 3.73.

65 Prudential Regulation of Investment in Australia's Export Industries, para 3.20.

4. Responding to Stranding Risk and Demand Uncertainty

As we describe in Section 2, the QCA has already applied a limited form of accelerated depreciation to accommodate demand uncertainty after 2055. This is far from the only example of a regulator applying accelerated depreciation in the face of stranding risk, nor is accelerated depreciation the only lever available to regulators seeking to account for stranding risk.

In this section, we place the QCA's Existing Approach and the Proposed Approach into the wider context of methods available and utilised to account for stranding risk.

4.1. General Approaches to Address Demand Uncertainty

There are three broad ways that stranding risk created by demand uncertainty is addressed in regulatory frameworks:

- **Mitigants**: This involves accelerating depreciation by front loading recovery of the RAB (which reduces the consequences of stranding occurring), or by shortening asset lives (which reduces the risk that assets are stranded).
  - Mitigants have recently been applied by regulators in Australia, the UK, and New Zealand for their gas networks (as we outline in the next section), and are popular since they lower the risk of asset stranding and alter the depreciation profile in NPV neutral manner. Yet, mitigants can increase prices for current customers, creating the potential for intergenerational inequities and a reduction in demand.
  - Aurizon's proposal to eliminate indexation for new assets is a form of mitigant since it front loads the recovery of the RAB.[66]
- **Ex-ante compensation**: a WACC uplift or other premium is provided up front to provide compensation for the *expected* cost of stranding, with firms receiving no further compensation if assets are stranded.
  - An advantage of this mechanism is that it settles the issue in advance, allowing investors to make investments without fear of a policy change. A disadvantage is that it requires an estimate of the risk and consequence of stranding and is very challenging to quantify the probability of certain policy or technology developments.
  - Ex-ante compensation has been applied to by the New Zealand Commerce Commission to address stranding risk for fibre broadband, as we outline in the next section.
- **Ex-post compensation**: The remaining value of stranded assets is compensated only if they are actually stranded. In this case, the remaining value of the stranded assets can be shifted to

[66] Note that network industries in the United States very rarely have indexed RABs, and instead earn a nominal rate of return on the historical cost of their assets. This style of regulation is not motivated by the desire to accelerate cost recovery in the face of stranding risk, but rather a long list of institutional precedent guaranteeing investor-owned utilities a reasonable opportunity to recover their actual investment costs, rather than introducing a somewhat subjective measure of inflation into the calculation. Nonetheless, this example serves to demonstrate that a historical-cost approach, with its accelerated recovery relative to an indexed-cost approach, is an equally valid regulatory method.

remaining consumers, or the government or some other institution can effectively underwrite the stranded assets.

- The upside of ex-post compensation is that it does not place a burden on consumers, taxpayers, etc., unless assets are actually stranded. However, it can be highly costly to the liable group if stranding occurs. In addition, it can dampen investment incentives given the risk that the firm is not bailed out by the government or that the stranded assets are too large to be shifted onto the remaining customer base without creating a death spiral.[67]

4.2. Regulator Responses to Demand Uncertainty

Regulators in Australia, the UK, and New Zealand have all recently implemented (or adjusted) accelerated depreciation or other compensation methods to account for asset stranding risk created by increasing demand uncertainty. Historically, regulators have been hesitant to change their approach under evidence-based decision making without strong evidence of decreasing demand. However, regulators have begun to adopt precautionary or probabilistic approaches to reflect the high level of risk that potential asset stranding poses to network owners and consumer bills.

We provide several examples below.

4.2.1. Western Australian gas sector

In the Western Australian gas sector, the ERA has begun to apply the WOOPS framework.[68] Like with coal, there is considerable uncertainty in future gas demand projections, with factors such as technological change and the energy transition implying a reduction in demand in the long term.

The WOOPS framework recognises that when there is policy or technological change with respect to the substitutes for an asset (or the commodity that uses that asset in the case of coal and gas), at some point that alternative becomes the binding constraint on pricing, as opposed to the regulated price. Once the alternative technology is the binding constraint on price, the regulated price (determined using a building blocks model) will no longer be sufficient for the asset owner to recover its efficient costs.

The WOOPS framework provides an approach for determining accelerated depreciation (by shortening regulatory economic lives), such that the asset owner can compete with competitive alternatives for longer and improve the chances of recovering its efficiently incurred investments.[69] It also allows for determination of the point at which sufficient depreciation can no longer be brought forward to cover the cost of the asset.

A key insight from the WOOPS framework is that if there is a risk of stranding in the future, it is important for regulators to act sooner rather than later. This is because there is eventually a point where front loading depreciation has no impact, since competitive forces control prices and not

[67] Death spiral, i.e., price increases which precipitate further stranding which precipitates further price increases, etc).

[68] The WOOPS framework is based on the work Crew and Kleindorfer in: Michael A. Crew and Paul R. Kleindorfer, "Economic Depreciation and the Regulated Firm under Competition and Technological Change", *Journal of Regulatory Economics*, 4(1), 51-61, 1992.

[69] See DBP, Attachment 9.2 – Assessment of the Economic Life of the DBNGP, January 2020, p.20.

the regulator. That is, there is a 'window of opportunity' for regulators to act. As Simshauser (2017) states, this window is contingent upon having, "*(1) a suitable suite of policy mechanisms available, and (2) the conviction (by policymakers or regulators) to act before a crisis actually develops*".[70]

WOOPS was applied by Dampier Bunbury Pipeline in Western Australia when proposing its depreciation allowance for its 2021-2025 access arrangement (AA5) and has adopted this approach again for its 2026-2030 proposal (AA6).[71] For AA5, the ERA capped the economic life of the pipeline to 2063 to reflect the DBP's findings, and recognised that the current framework needed to be revised due to, "*current technological and policy uncertainties and their implications for the future usefulness of natural gas pipelines*".[72]

4.2.2. Eastern Australian gas sector

For the rest of Australia, the AER explored the future demand uncertainty for gas in its 2021 information paper "Regulating Gas Pipelines Under Uncertainty". In this paper it concluded that:

> *…some form of accelerated depreciation would be appropriate if there is sufficient evidence to demonstrate and quantify the pricing risk and stranded asset risk arising from demand uncertainty*.[73]

The AER has demonstrated a willingness to act in a precautionary manner, having allowed accelerated depreciation through a reduction in asset lives or an additional depreciation allowance for each of its gas networks' access arrangements since 2021. This encompasses decisions in NSW, Victoria, ACT, and SA.[74] Most recently the AER considered it prudent to allow a "*measured start*" to accelerated depreciation for Jemena Gas Networks in NSW in the 2025–2030 period as a "*precautionary step*" given uncertainty around future demand.[75]

Notably, unlike Victoria and the ACT there is currently no statewide ban on new gas connections or a gas substitution roadmap in NSW. Yet, the AER recognised the uncertainty of the speed of electrification and the materialisation of this impact on gas demand.[76]

---

70 Paul Simshauser, "Monopoly regulation, discontinuity and stranded assets", Energy Economics, 66, 384-398, 2017, p.390.

71 DBP's WOOPS modelling for AA5 is outlined in DBP, Attachment 9.2 – Assessment of the Economic Life of the DBNGP, January 2020; DBP has proposed the continuation of the current 2063 economic life cap for asset lives for AA6. EAR, Draft decision on revisions to the access arrangement for the Dampier to Bunbury Natural Gas Pipeline (2026 to 2030) – Attachment 6: Depreciation, 7 July 2025, para 44.

72 ERA, Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025 – Submitted by DBNGP (WA) Transmission Pty Ltd, 1 April 2021, paras 1491-1492, 1526.

73 AER, Regulating gas pipelines under uncertainty – Information paper, November 2021, p.44.

74 This includes Jemena Gas Networks in NSW (2025), AusNet in Victoria (2023), AGN in NSW and Victoria (2023), MGN in Victoria (2023), APA Transmission in Victoria (2022), Evoenergy in ACT (2021), and AGN in SA (2021).

75 The AER had not previously allowed accelerated depreciation for JGN for long term demand uncertainty, notably declining JGN's request for shortened standard asset lives during its previous 2020 access undertaking. AER, Draft decision Jemena Gas Networks (NSW) access arrangement 2025 to 2030 – Attachment 4 – Regulatory depreciation, November 2024, ("2024 JGN Draft Decision - Regulatory Depreciation), p.14; AER, Final Decision Jemena Gas Networks (NSW) Ltd Access Arrangement 2020 to 2025 – Attachment 4 – Regulatory depreciation, June 2020.

76 Final decision Jemena Gas Networks (NSW) access arrangement 2025 to 2030 – Attachment 4 – Regulatory depreciation, May 2025, ("2025 JGN Final Decision - Regulatory Depreciation"), p.9.

The AER considered this precautionary approach to be appropriate to ensure JGN is not deterred from making efficient investments and to share risk between JGN and the customer base while the customer base is still large.[77] The AER emphasized that delaying accelerated depreciation could potentially lead to an even larger residual value of JGN's capital base being stranded in the long term under a future scenario of declining demand and rising prices.[78]

4.2.3. UK gas sector

In the UK, Ofgem has determined that accelerated depreciation beyond the current rate is needed during RIIO-3 for its gas networks for similar reasons.

> *Our principal objective is to protect current and future consumers, which includes considering their interest with respect to net zero. In the gas sector, following this objective suggests that we should start to address future gas demand reduction and its potential impact on consumer bills. Whilst accelerating depreciation during RIIO-3 will increase the depreciation charge within current consumer bills, this is expected to be offset by a lower depreciation charge in the future than currently forecast, with a fairer intergenerational distribution of this element of the network costs. Delaying a decision on accelerating depreciation has the possibility to worsen the problem, as the consumer base left to pay for the largely fixed cost of past investment in the network decreases*.[79]

In July 2025, Ofgem released its draft determinations for the RIIO-3 period (due to start in April 2026), with final determinations expected before the end of the year. In the draft, Ofgem proposes to (a) retain existing depreciation policy on existing assets; and (b) set asset lives on new assets to fully depreciate by 2050, following the accelerated "sum-of-years'-digits" profile.[80],

While it considered other options for accelerated depreciation which would apply to the whole asset base, Ofgem opted for separate treatment of the existing and new assets, which it considered to be "cautious but proactive".[81]

In particular, Ofgem highlighted the trade-off between short-term consumer bill increases with retaining flexibility to uncertain future demand for the gas networks (including the possibility that government Net Zero policy changes and the assets are not ultimately stranded):

> *By accelerating depreciation for new assets only, we can begin the process of accelerated depreciation based on the facts and outlook available to us today, without locking in a more aggressive policy that may later prove unnecessary or misaligned with government direction. This approach also avoids a sharp increase in consumer bills in the short term, which is particularly important given current affordability concerns.*[82]

---

77 2025 JGN Final Decision - Regulatory Depreciation, pp.8,10.

78 2024 JGN Draft Decision - Regulatory Depreciation p.14.

79 Ofgem, RIIO-3 Sector Specific Methodology Decision – Finance Annex, 18 July 2024, ("RIIO-3 SSMD Finance Annex"), para 8.20.

80 For example, for a 20 year asset, in the first year it would depreciate by $\frac{20}{20+19+\cdots+1}$ of its initial value, and in the second year it would depreciate by $\frac{19}{20+19+\cdots+1}$ of its initial value, and so on.

81 Ofgem, RIIO-3 Draft Determinations – Finance Annex, 1 July 2025, para. 8.42.

82 Ofgem, RIIO-3 Draft Determinations – Finance Annex, 1 July 2025, para. 8.39.

4.2.4. New Zealand gas sector

Likewise in New Zealand, the NZCC shortened asset lives in its 2022 gas default price path (DPP3) in response to its expectation that demand for natural gas will fall with the country's transition towards net zero.[83] The NZCC did so by applying an asset adjustment factor to the average asset lifetimes based on its view of the likelihood of its two wind-down scenarios occurring.[84]

The NZCC has not yet made its determinations for DPP4 beginning 1 October 2026, though it has indicated that it expects its DPP4 decisions on asset lives to be informed by updating its two wind-down scenarios.[85] Hence, asset lives will likely be re-adjusted to reflect changes in how the NZCC views the likelihood of the timeframe for the decline in demand.

4.2.5. New Zealand telecommunications sector

The NZCC also took a probabilistic approach to stranding risk in its 2020 Fibre Input Methodologies where it used its view on the probability of stranding over a certain time period and the proportion of the RAB that is stranded to calculate an implied discount rate increment to account for the stranding risk. The NZCC implemented this as an ex ante allowance via cash flows.[86]

4.3. Conclusions on Regulatory Approaches

Recent regulatory precedent indicates that regulators view potential asset stranding from uncertain future demand as something that should be addressed proactively and adjusted as the demand outlook changes. Given this precedent, the increase in uncertainty around the future usage of CQCN that we discuss in Section 3, and the outdated nature of the Existing Approach, it is appropriate to reconsider whether the Existing Approach should be updated.

83 NZCC, Default price-quality paths for gas pipeline businesses from 1 October 2022 – Final Reasons Paper, 31 May 2022, ("NZCC Gas DPP3"), Section 6.

84 The NZCC placed a one-third weighting to its 2050 wind-down scenario, and a two-thirds weighting to its 2060 wind-down scenario. NZCC Gas DPP3, paras 6.22.1, 6.24.

85 NZCC, Gas DPP4 reset 2026 – Issues paper, 26 June 2025, para 4.5.

86 NZCC, Fibre input methodologies: Main final decisions – reasons paper, 13 October 2020, para 6.1140 and pp.585-588. The NZCC considered that the main risk of asset stranding of the fibre telecommunications network was in respect of technological advances. In particular, the uptake of fixed wireless broadband.

5. Modelling Methodology and Assumptions

We demonstrate the impacts of Aurizon's proposals on tariffs paid by end users, particularly given an uncertain demand outlook for each of the four Coal Systems. We capture this uncertain demand outlook using a scenario-based approach covering a wide range of potential outcomes. The purpose of these scenarios is not to represent a forecast of what *will* happen in the CQCN, or even what is likely to happen, but rather to demonstrate the uncertainty in potential outcomes, and how policy design today can partially mitigate the impacts of that uncertainty in future years.

In this section, we briefly describe our modelling approach and any simplifying assumptions we have made.

5.1. Overall Framework

To model the impact of different depreciation policies, we have built a simplified RAB model which demonstrates how revenue allowances and tariffs evolve each year from the beginning of UT6 until 2055, depending on (a) annual capital expenditure; (b) annual delivery volumes (in tonnes); and (c) the treatment of depreciation and RAB indexation.

In terms of the overall modelling approach, we start from the opening values in 1999, when each of the four Coal Systems' rail assets were initially valued, and subsequently extend through to 2055. The period prior to UT6 is important for approximating the size and age of the existing asset base (which is relevant for future periods' revenues).

We present results from the beginning of UT6 in July 2027 to the end of the potential UT9 period in June 2047 (assuming four five-year periods). We do not present results after that period because the end-of-period effects become highly distortive to revenues as the Global Economic Constraint approaches. In practice, we assume that other interventions will happen to ensure that capex required in the 2050s is not essentially expensed and charged exclusively to customers in those few years.

5.2. Differences in Depreciation Approaches

In this section, we describe the mechanical differences between the existing treatment of depreciation, asset lives, and RAB indexation (i.e. the Existing Approach), and the amendments to it that Aurizon proposes (i.e. the Proposed Approach).

5.2.1. Existing Approach

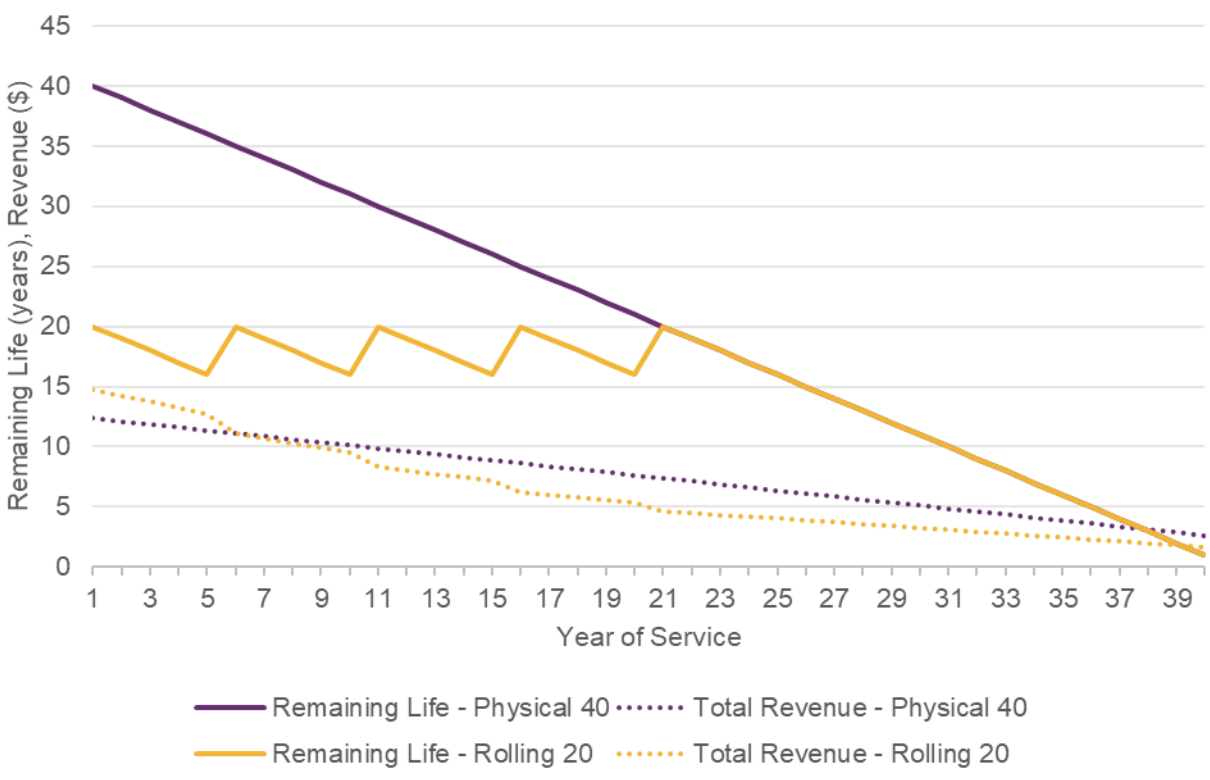
Under the Existing Approach, the entire RAB is escalated based on outturn inflation in each year. Aurizon is compensated based on a nominal WACC, and the nominal inflation of the RAB each year is netted off of Aurizon's MAR.

Treatment of asset lives depends on when the assets were added to the RAB. Assets added before the beginning of UT3 in 2009 were depreciated on a straight-line basis over the physical life of the specific asset, or by the Global Life Constraint of 2055, whichever is sooner.

For assets added from UT3 onward, asset lives are treated on a "Rolling 20" basis, described in Section 2.2.

The Rolling 20 approach allows for a frontloading of revenues over what is ultimately the same total asset life. We illustrate this in Figure 5.1 below, for a hypothetical $100 asset with a physical asset life of 40 years, 5-year resets, a 10% WACC, and no inflation. We show the remaining asset life and the total revenue (depreciation plus return) both based on the physical asset life (40 year straight line depreciation) and the Rolling 20 approach. As the figure shows, revenues are higher in the Rolling 20 approach during the first regulatory period, because 1/20th of the original value depreciates in each year instead of 1/40th. After each regulatory period, revenues drop as the asset life jumps up from 16 to 20 (until it is bound by the physical asset life). The two approaches are equivalent in NPV terms.

Figure 5.1: Illustration of Rolling 20 Approach



Source: NERA illustration

Under the Existing Approach, we assume that the Rolling 20 policy will apply to all capex to the end of the modelling period.

5.2.2. Proposed Approach

For the Proposed Approach, we apply the following changes as of UT6:

- All assets in the RAB prior to 1 July 2027 are subject to the Rolling 20 asset life policy. In practice, this would newly apply to assets added before July 2009, which are currently assumed to depreciate based on their physical lives. This is not applied retroactively – instead asset lives reduce from the minimum of their physical level or the level to the 2055 Global Economic Constraint in 2026/27, to 20 years in 2027/28.

- For assets added from the beginning of the UT6 term, they are not indexed to inflation. Accordingly, the value of these assets is not increased for inflation and consequently inflation for these assets is not subtracted from the revenue allowances. In practice, Aurizon proposes a revenue adjustment for the difference between forecast and outturn inflation, but for the purposes of our modelling, we do not assume any forecast error in inflation. As the removal of inflation indexation also represents a form of accelerated depreciation, Aurizon also proposes to substitute the rolling 20 year reset depreciation profile with straight line depreciation.
- For Moura specifically, we apply an Accelerated WAML of 30 June 2048, superseding the Global Constraint of 30 June 2055, which continues to apply to all of the other mine regions.

All other elements of the Capital Recovery Approach are the same between the QCA and Aurizon approaches.

5.3. Global Assumptions

In this section, we briefly summarise the assumptions that hold across all scenarios:

- Across the four mine systems, Aurizon has provided us with historical capex since 1999/00. We treat each year's capex as its own vintage, depreciating and escalating as appropriate for that point in time. We treat the opening asset value of 1999/00 as a single vintage as of that date, substantially larger than any one year's capex. In some years, deferrals are added to the RAB from previous years' capex. For simplicity, we treat this identically to capex spent in the year that it is added to the RAB.
- For physical asset lives (i.e. ignoring differences in the Capital Recovery Approach):
  - For the opening value of the RAB (in 1999), we understand that many of those assets are physical works like bridges and tunnels which are expected to last many years. Thus, we assume that these assets have a physical asset life that would take them to the global constraint of 2055.
  - For assets added between 1999 and 2005, Aurizon has provided us with the weighted average asset life as of 2005/06 of 40.23 years. We round to the nearest whole year (40 years), and then assume that each preceding year's vintage has an initial asset life one year longer. These are aggregated across all four systems.
  - For assets added between 2006/07 and 2008/09, Aurizon has provided the weighted average asset life by each year, ranging from (rounded) 32 to 39 years. These are aggregated across all four systems.
  - Aurizon has provided actual capex by individual asset in 2021/22 to 2023/24. Separately for each system, we calculate the average asset life. We exclude ballast work, which has been capitalised over an 8 year life since 2021/22. We apply this three year average for all remaining years starting in 2009/10. These values range from 27 years for Goonyella to 38 years for Newlands.
- Excluding ballast, which we separately depreciate over 8 years, we assume that all assets physically depreciate on a straight-line basis over the average life of their vintage. In practice, this assumption results in more backloaded revenues than what would apply if we modelled

each asset separately (as actually happens).[87] However, we make this simplification under all scenarios and depreciation policies, so the *differences* between depreciation policies are not particularly affected by this simplification.

- Aurizon has provided us with historical values of inflation, as well as their estimates for inflation for each year of the future (converging on a long-term assumption of 2.74%). We assume no forecast error in inflation.
- For all years, we use a WACC of 7.69% (nominal), as advised by Aurizon.
- We do not include operating costs in our model, which is invariant to the Capital Recovery Approach. Thus, our results should not be read as forecasts of actual tariffs.

5.4. Scenario Description

Aside from differences in the Capital Recovery Approach described in Section 5.2, we consider three different scenarios which reflect much of the uncertainty in supply and demand conditions described in Section 3. For each scenario, Aurizon has provided us with an indicative estimate of annual volumes (in tonnes) as well as the capex that would be required to meet those volumes in each year, out to 2050.

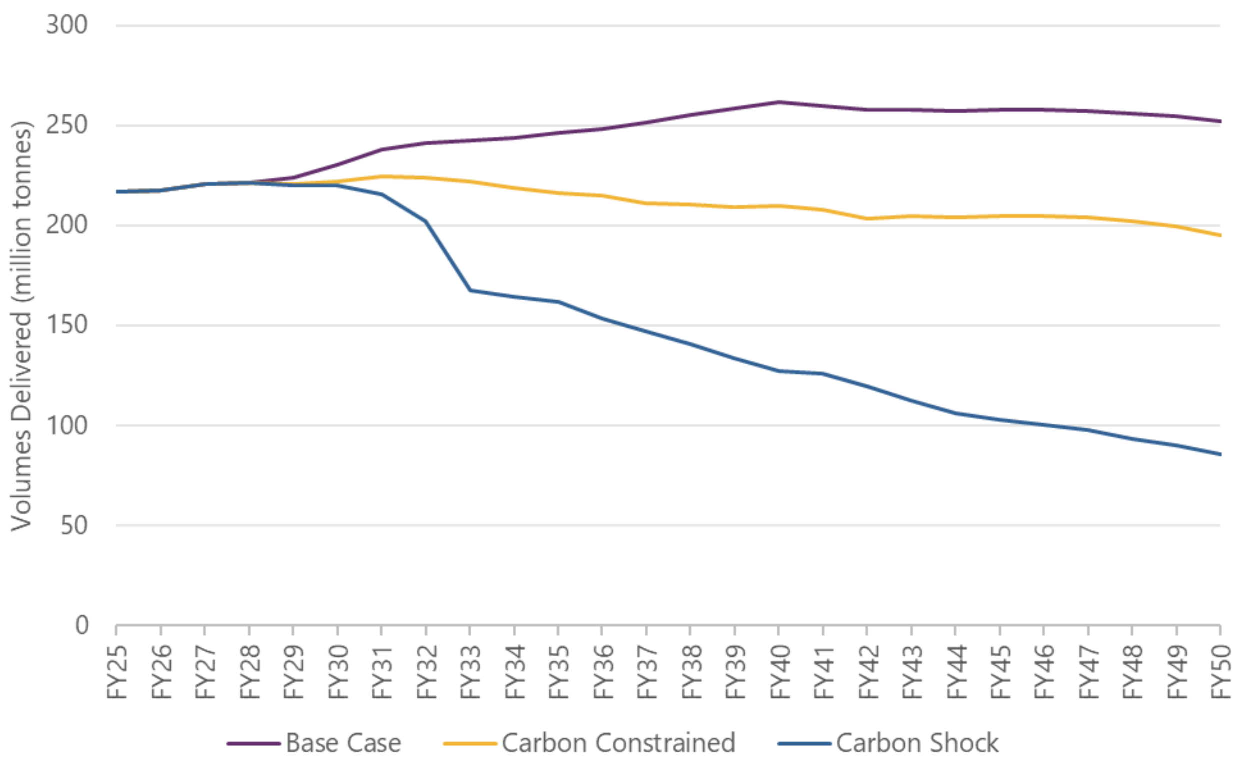
The scenarios are as follows:

- **Base Case:** This scenario reflects a world with no shocks to the supply or the demand conditions. This scenario assumes slightly increasing volumes, from roughly 220 million tonnes presently to 250 million tonnes in 2050. Capex in this world is generally increasing to maintain the network at existing and increasing levels of usage.
- **Carbon Constrained:** This scenario reflects a world where policy interventions in the Asian region and the underlying economics of substitutes reduce the demand for coal. Thus we see slightly declining volumes to around 200 million tonnes in 2050. Capex in this world increases slightly as more renewals are required toward the end of the period.
- **Carbon Shock:** This scenario reflects a world with a demand-side shock to the coal export industry that produces a sharp decline in the volumes that pass through Aurizon's network, down below 100 million tonnes in 2050. While capex does decline slightly in this world, a significant portion of it is invariant to volumes and must be carried out regardless of volumes.

In Figure 5.2 and Figure 5.3 below, we show the indicative estimates of demand and capex under each of these three scenarios across the CQCN (though we apply values which are specific to the system). Note that the scenarios broadly align until roughly 2030, reflecting the fact that it is not possible to know with any reasonable amount of confidence what the demand outlook is likely to be in advance of the UT6 decision.

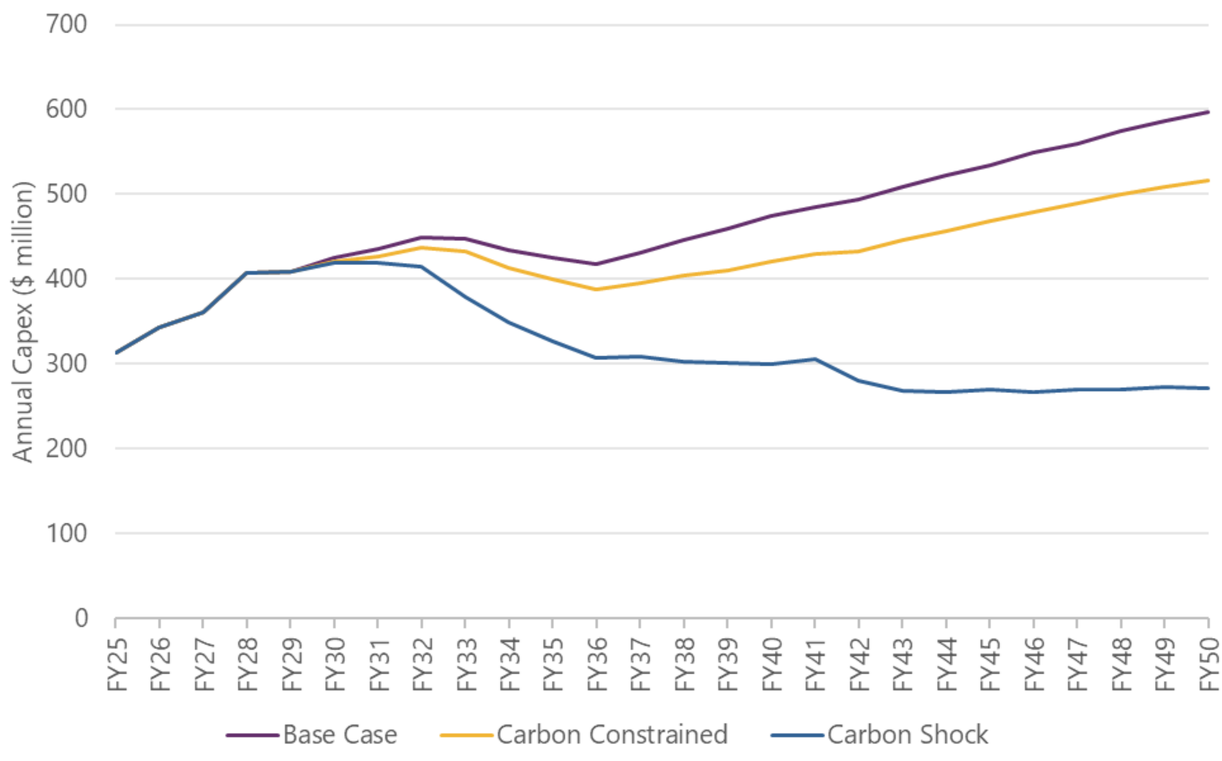
[87] Consider two assets added in 2010, each worth $60. One has an asset life of 10 years and one has an asset life of 30 years. Treating this as one $120 asset with a 20-year asset life (as we do for simplicity) would imply $6 in depreciation every year for 20 years. Treating them as separate assets would imply $8 in depreciation every year for 10 years, and $2 every year for a further 20 years.

Figure 5.2: Volume Profile by Scenario (CQCN)



Source: Aurizon

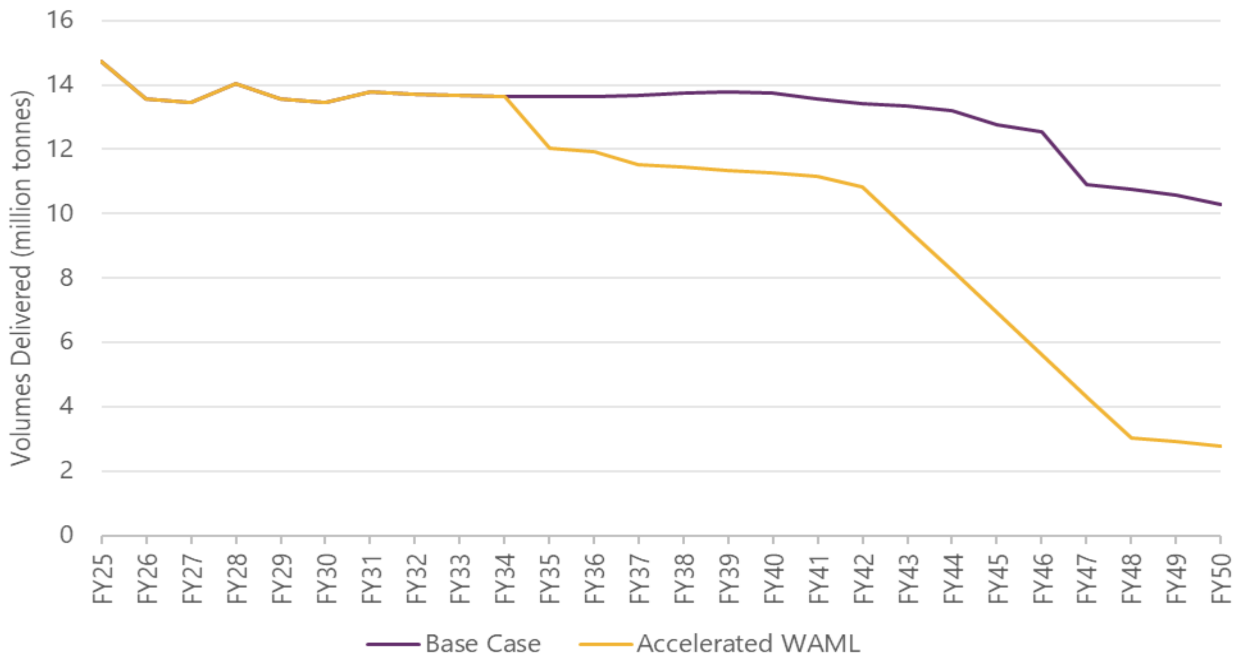
Figure 5.3: Capex Estimates by Scenario (CQCN)



Source: Aurizon

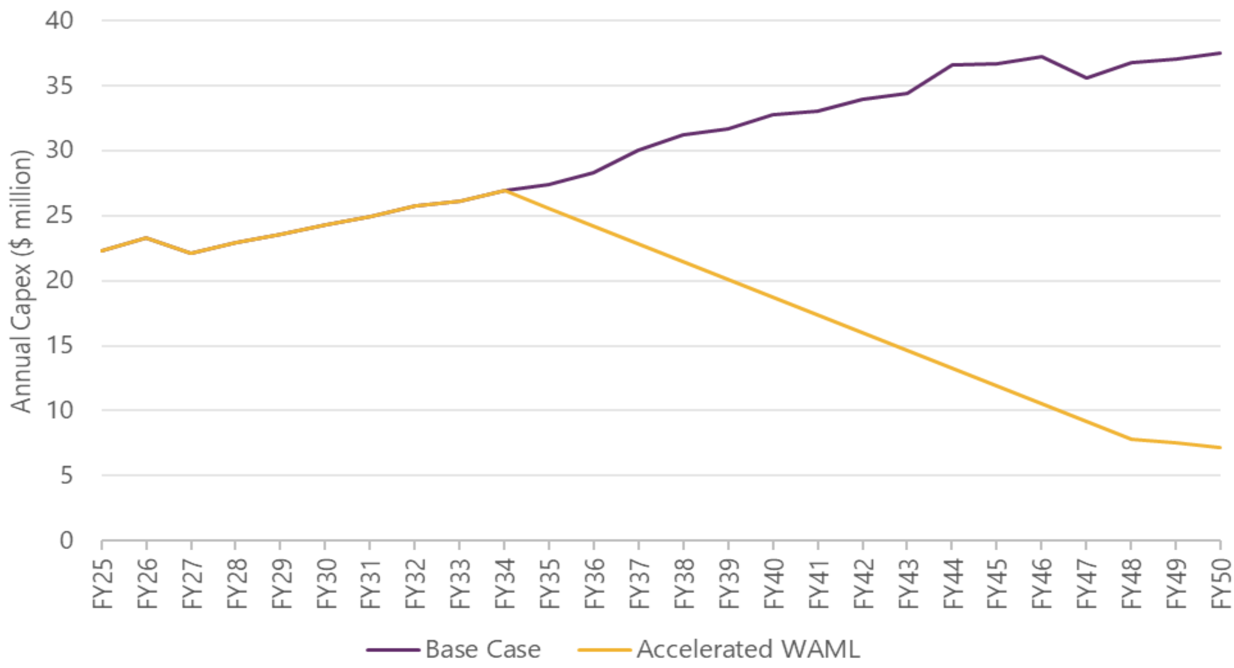
Additionally, for just the Moura system, we have considered an Accelerated WAML scenario, which shows sharply declining capex and demand, almost disappearing after 2048. In Figure 5.4 and Figure 5.5 below, we show the volume and capex profile for Moura only under both the Base Case and the Accelerated WAML case.

Figure 5.4: Volume Profile, Base Case and Accelerated WAML (Moura)



Source: Aurizon

Figure 5.5: Capex Profile, Base Case and Accelerated WAML (Moura)



Source: Aurizon

It is important to note that these scenarios are not intended to reflect a forecast of what *will* happen to the Central Queensland Coal Network, or even what is likely to happen. Instead, they are intended to demonstrate the uncertainty in potential outcomes, and how policy design today can partially mitigate the impacts of an uncertain outlook in future years.

5.5. Measured Outputs

Under each scenario and depreciation approach, we model MAR (excluding opex) for each of the four Coal Systems, as well as for CQCN overall. We then divide these by volumes to produce a tariff profile. In practice, we understand that these base tariffs are then adjusted for the length of each journey, but that tariffs as represented in $/tonne is a standard metric well understood by users of CQCN.

While we perform our modelling on a regional basis, we only report results aggregated on a CQCN level, additionally separating out Moura to discuss the implications of the Accelerated WAML in that region.

6. Impact of Changing the Capital Recovery Approach

In this section, we set out the revenue and tariff impacts from switching between the Existing Approach and the Proposed Approach, under each of the different scenarios described above. We then use these impacts to draw overall conclusions regarding the Proposed Approach.

This section proceeds as follows:

- In Section 6.1, we identify the tariff impacts of the Proposed Approach under the Base Case scenario (i.e. Business As Usual conditions). For this analysis and the other CQCN scenarios covered in the next section, we only consider the first two elements of the Proposed Approach, leaving aside the introduction of the 2048 WAML in Moura. This is because the third policy would impact only one mine region, so it would not be very instructive to show its impact *on average* across CQCN.
- In Section 6.2, we identify the tariff impacts of the Proposed Approach under the two downside scenarios (Carbon Constrained and Carbon Shock).
- In Section 6.3, we identify the tariff impacts of just the third element of the Proposed Approach (the 2048 WAML in Moura), under both the Base Case scenario and an Accelerated WAML scenario in which there is only minimal usage of the Moura rail network after 2048.
- In Section 6.4, we provide overall conclusions on our modelling and on the appropriateness of the Proposed Approach.

6.1. Base Case Impacts

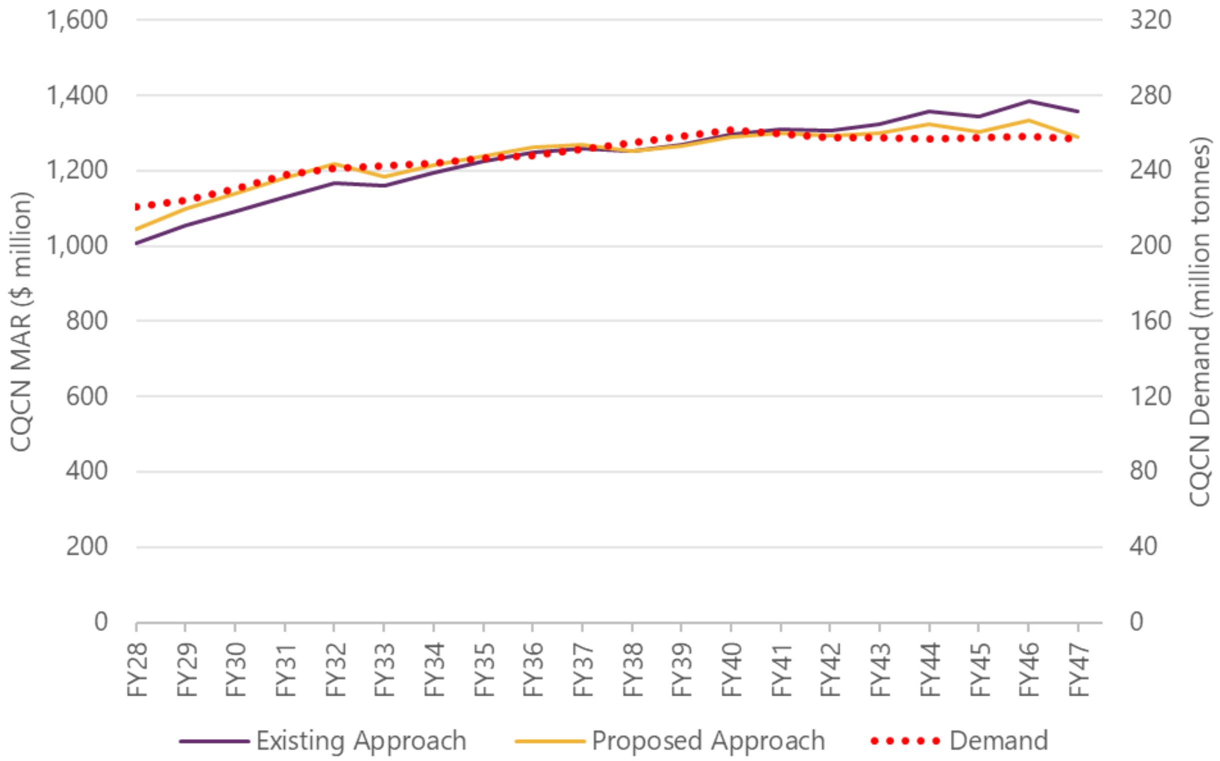
In Figure 6.1, we show the MAR impacts of the two depreciation approaches in the Base Case, overlaid with Aurizon's indicative demand estimates in that scenario (measured on the right axis). As the figure shows, the Proposed Approach produces a higher MAR in the earlier periods than the Existing Approach, and a lower MAR in the later years. Both have an increasing MAR overall, but, especially in the case of the Proposed Approach, this closely tracks the increase in demand.

We divide each of these MAR projections by the demand projection to produce a tariff projection, which we present in Figure 6.2 below, alongside the differences between them on the right axis. As the figure shows, the two methods produce very similar tariffs, reflecting the modesty of the differences in the two policies, and in particular reflecting that much of the RAB is treated identically between them.

Like with the MAR analysis, the Proposed Approach produces a higher tariff than the Existing Approach in the earlier years, in exchange for a lower tariff in later years. Additionally, because the shape of the MAR closely tracks the shape of demand, the Proposed Approach produces a tariff that is virtually flat over the entire period, while the Existing Approach produces tariffs that increase slightly over that period.

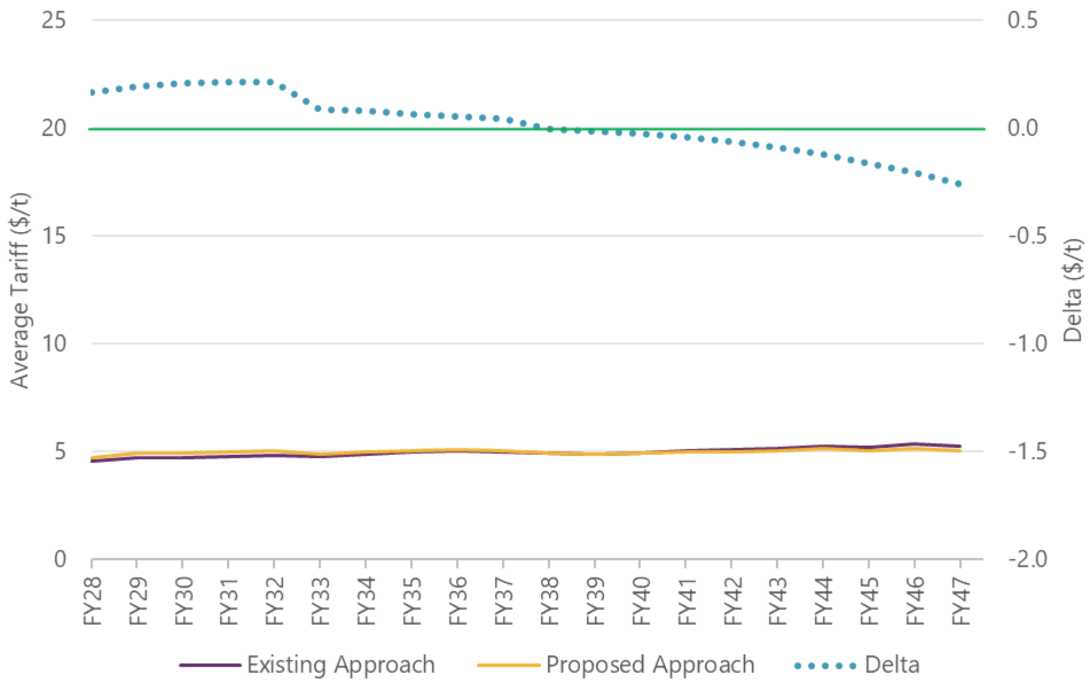
In short, under a "base case" or "business as usual" world, either method produces tariffs that are stable, predictable, and that do not place an unmanageable burden on users of CQCN.

Figure 6.1: MAR and Demand, Base Case (CQCN)



Source: NERA Analysis

Figure 6.2: Tariffs, Base Case (CQCN)



Source: NERA Analysis

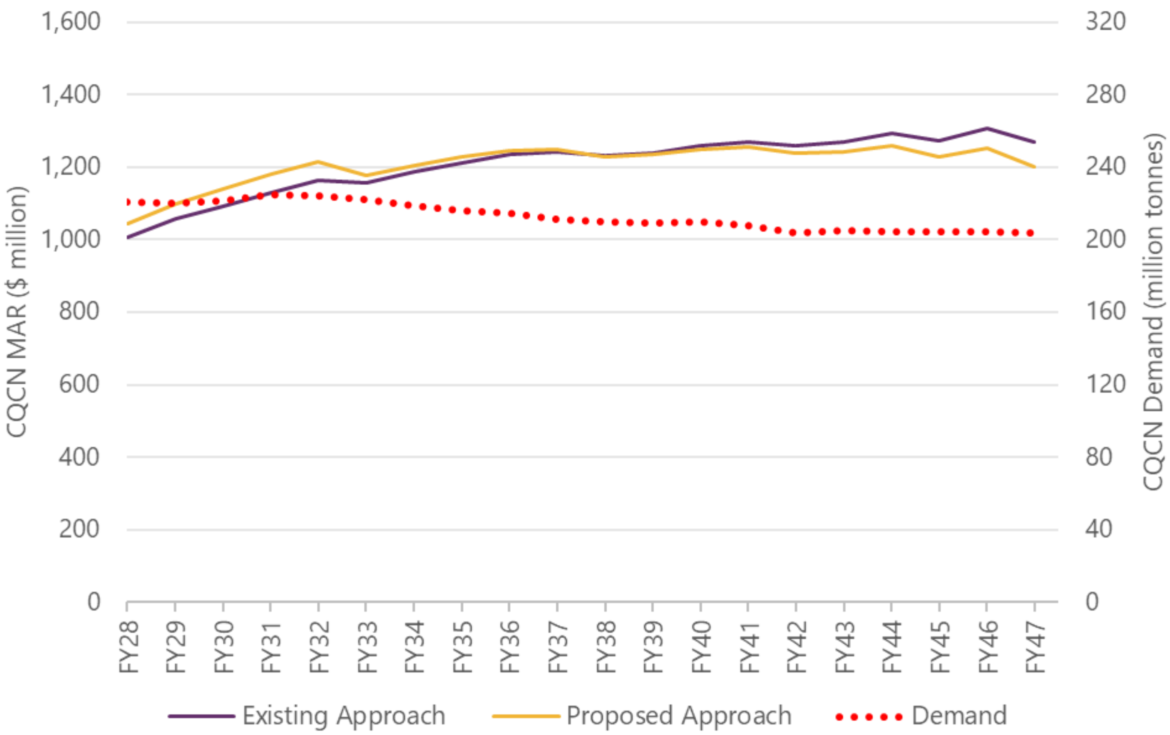
6.2. Alternative Scenarios

When we consider the other scenarios, the differences between the depreciation policies become clearer. Because the scenarios do not diverge at all from the base case until 2028/29, all charts start with the same profile in the first year we model, and only differ slightly for a few years thereafter.

6.2.1. Carbon Constrained

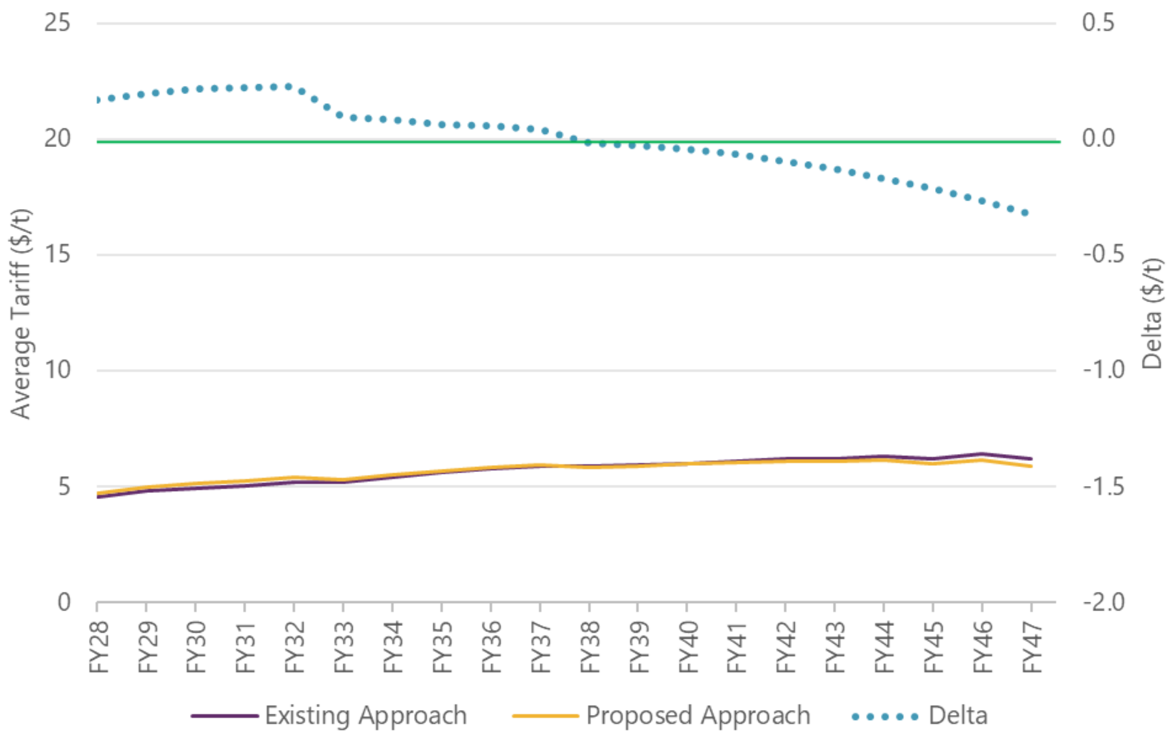
First, we discuss the Carbon Constrained scenario, as shown in Figure 6.3 and Figure 6.4 below. The Carbon Constrained scenario represents a relatively modest downside scenario in which demand does not dramatically decline but does not grow to absorb increasing capex requirements in that scenario. Thus, under both approaches, tariffs increase somewhat from their current level, but more so under the Existing Approach.

Figure 6.3: MAR and Demand, Carbon Constrained (CQCN)



Source: NERA Analysis

Figure 6.4: Tariffs, Carbon Constrained (CQCN)



Source: NERA Analysis

6.2.2. Carbon Shock

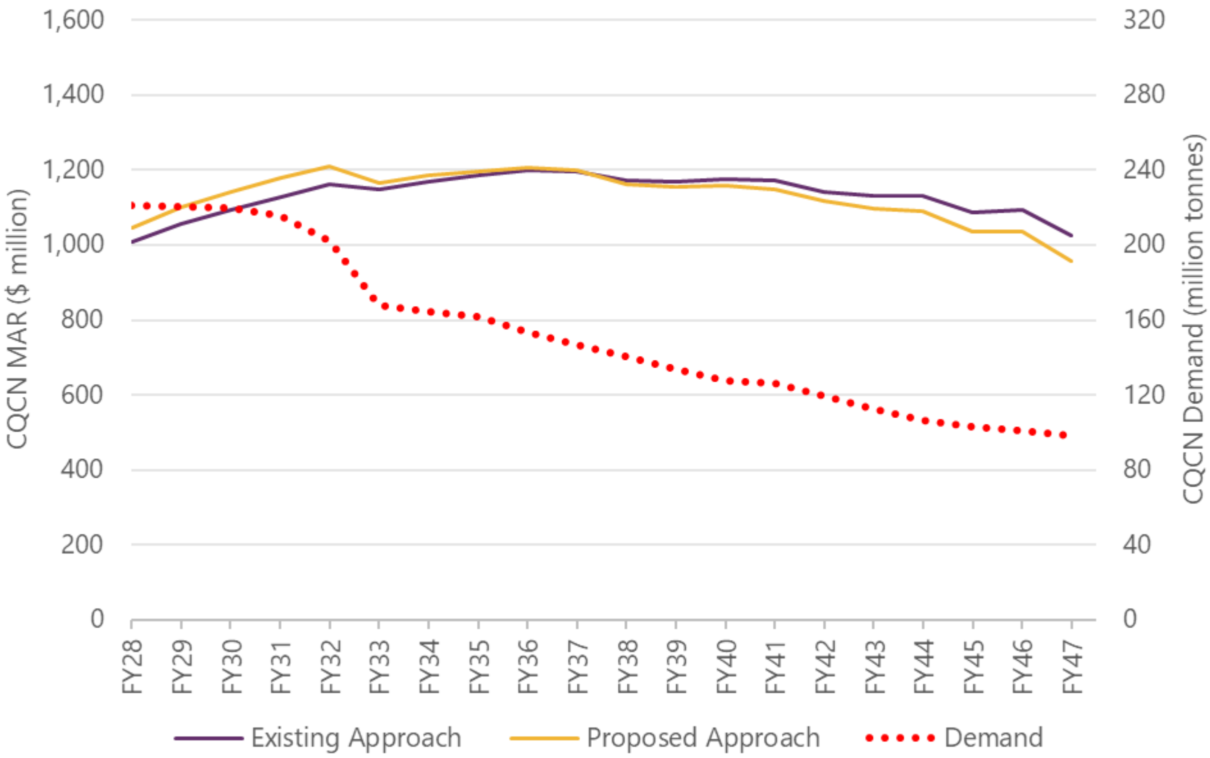
Next, we discuss the implications of Carbon Shock scenario, a more dramatic reduction in demand, especially after the first five years we model. We present the results in Figure 6.5 and Figure 6.6 below.

In this case, we again see that the MAR is similar under each of the policies, albeit slightly decreasing by the end of the period, as opposed to the other scenarios in which MAR increases. However, the decrease in MAR is relatively small, reflecting that (a) a considerable portion of capex is invariant to volumes and thus cannot be easily avoided; and (b) a considerable portion of MAR relates to the recovery of capital incurred in previous years, when demand (and maybe the demand outlook as well) was higher.

Thus, we see a bigger gap in tariffs in the later years, when the small differences in MAR are spread across a much smaller customer base. By the end of the period presented, tariffs under the Existing Approach are around $0.70 higher than under the Proposed Approach, compared to a $0.20 difference in the other direction in the early years.

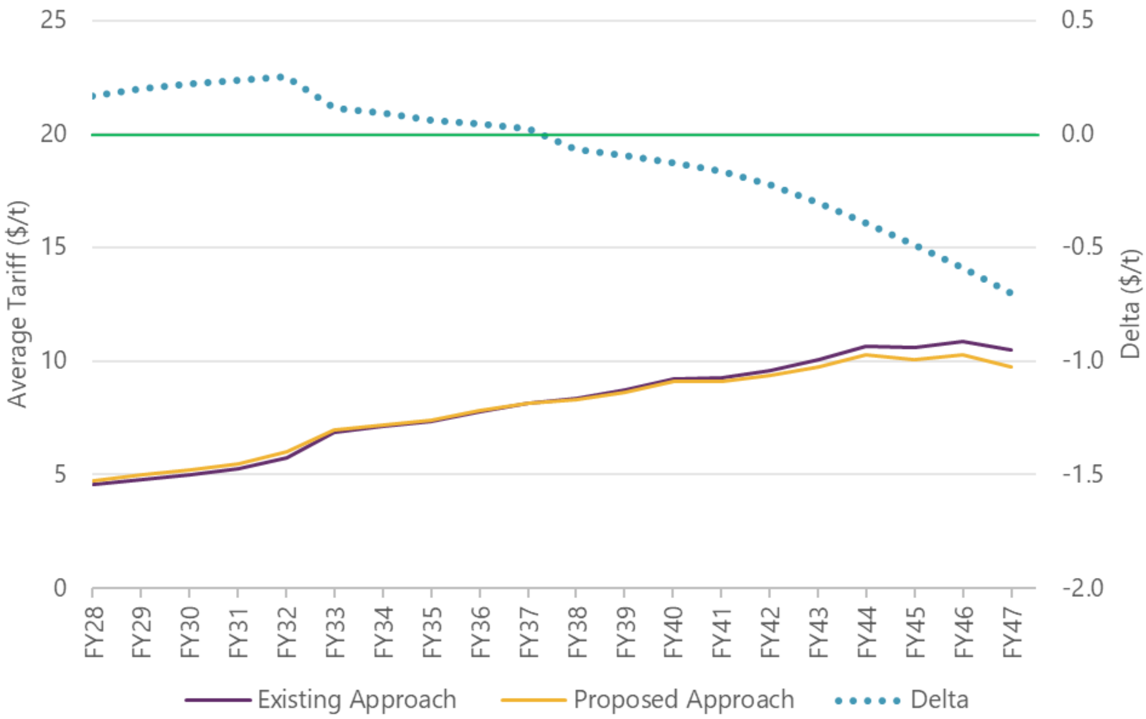
In both scenarios, tariffs increase substantially, from below $5/tonne to above $10/tonne. Given that this scenario is driven by a reduction in global demand, it is possible that these tariffs will make Central Queensland coal less competitive in global markets, leading to a further reduction in demand for CQCN and eventually a demand death spiral.

Figure 6.5: MAR and Demand, Carbon Shock (CQCN)



Source: NERA Analysis

Figure 6.6: Tariffs, Carbon Shock (CQCN)



Source: NERA Analysis

6.3. Accelerated WAML

Separately from the above analyses, we consider the impact of the Accelerated WAML (the third element of the Proposed Approach) on revenues and tariffs in the Moura system. For this analysis, we consider two scenarios:

- **Base Case scenario**, as used in Section 6.1 above (but using only the Moura components of that analysis).
- **Accelerated WAML scenario**, as described in Section 5.4 above. Under that scenario, demand and capex nearly disappears after 2048, though these are identical to the Base Case until 2034.

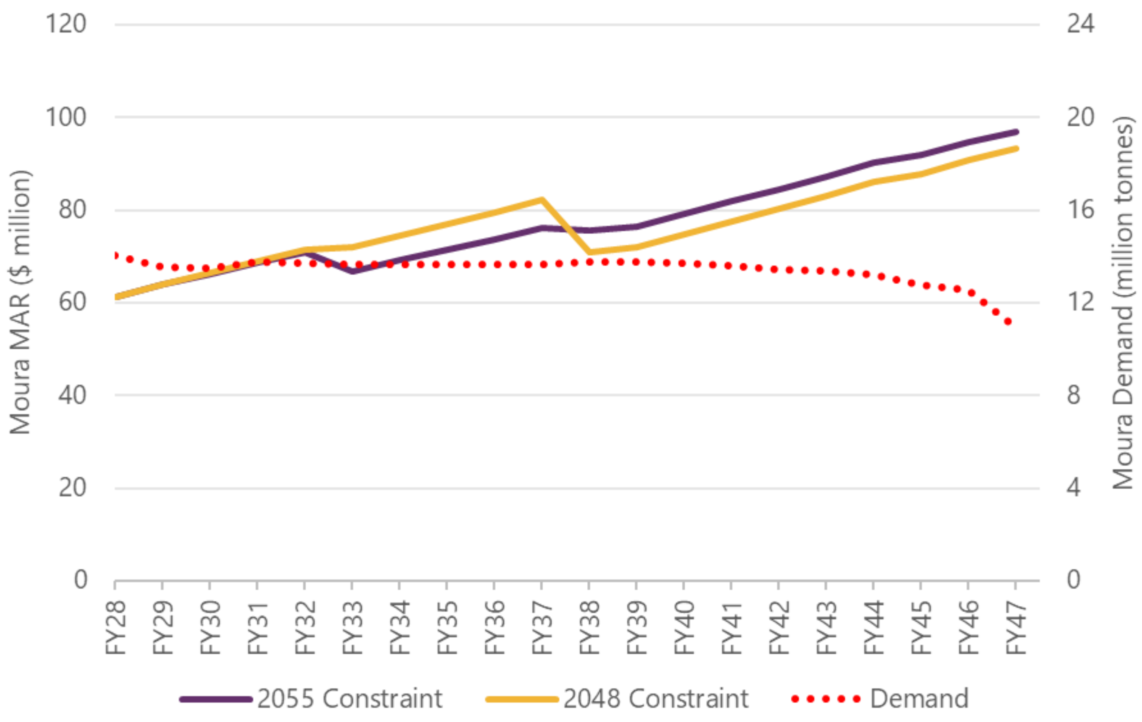
We consider two policy approaches, both of which utilise the first two components of the Proposed Approach:

- **2055 Constraint** continues to use the Global Economic Constraint of 2055. However, if the Accelerated WAML *scenario* transpires, we assume that this would be apparent by 2034, when the demand assumptions deviate from the Base Case. Because asset lives can be re-visited at each new undertaking, we assume that these are shortened to a 2048 constraint as of the beginning of UT8 in 2037, *only in the Accelerated WAML scenario*. In the Base Case scenario, 2055 Constraint is the "correct" approach and does not get amended.
- **2048 Constraint** imposes an economic constraint of 2048 on all assets in the Moura system, effective as of the beginning of UT6. However, for the same reason as above, we assume that this is corrected back to a 2055 constraint as of the beginning of UT8 in 2037, *only in the Base Case scenario*. In the Accelerated WAML scenario, the 2048 Constraint is the "correct" approach and does not get amended.

Which is to say, under both depreciation policies for the Moura, we do not assume they are implemented on a "set and forget" basis, as this would produce implausible results in later years if the depreciation policy chosen now no longer matches the scenario that eventuates.

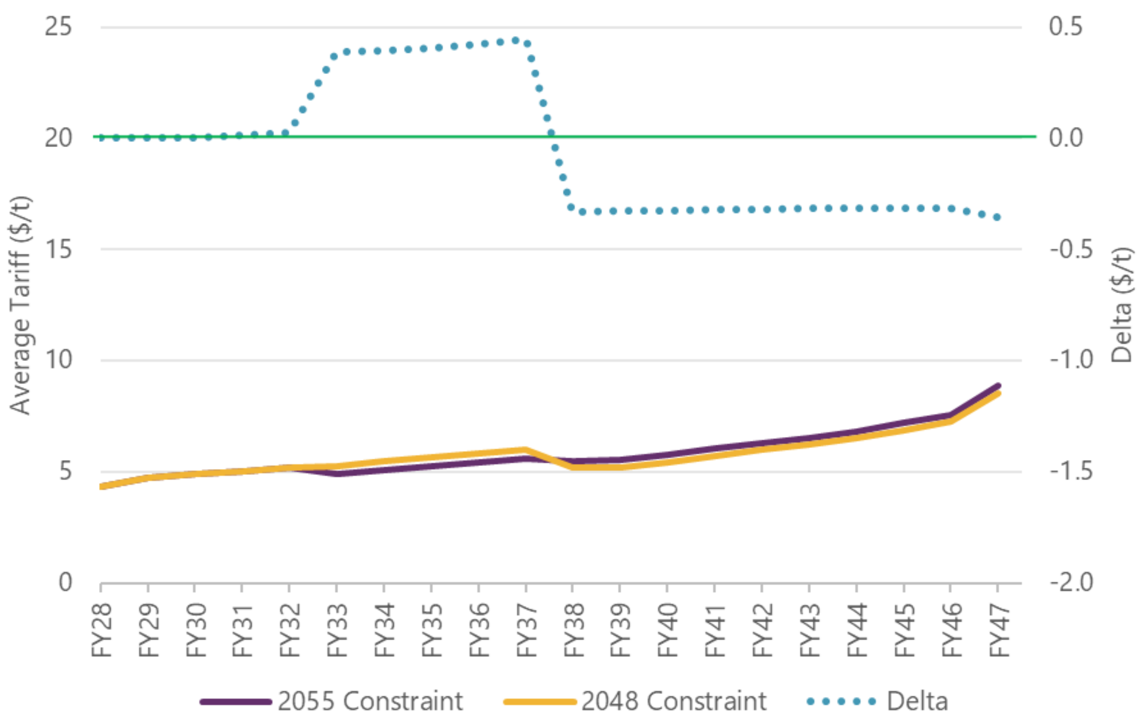
In Figure 6.7 and Figure 6.8 below, we show MAR, demand, and tariffs in the Base Case scenario, in which significant activity continues beyond our modelling horizon.

Figure 6.7: MAR and Demand, Base Case (Moura)



Source: NERA Analysis

Figure 6.8: Tariffs, Base Case (Moura)



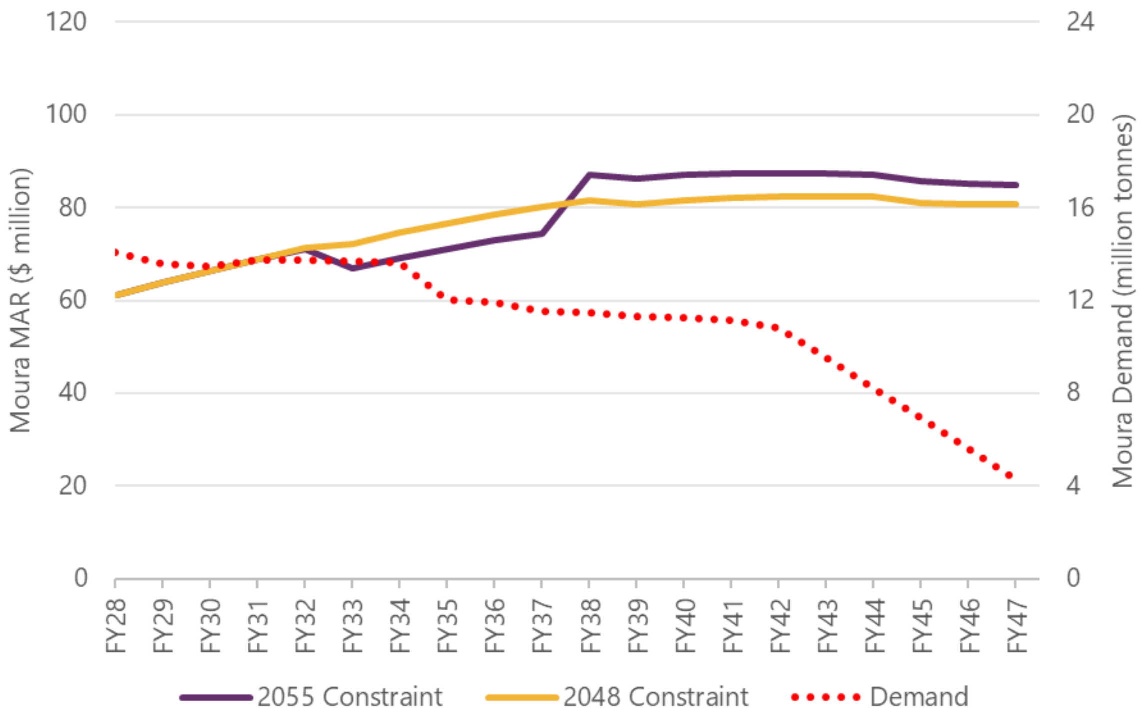
Source: NERA Analysis

Several patterns are visible in these figures:

- Tariffs are virtually identical in the UT6 period. This is because the Rolling 20 policy is binding (i.e. both the 2048 and the 2055 constraints are more than 20 years away at the beginning of the period). Minimal differences emerge regarding assets added during the last three years of the period: Under the 2055 Constraint in which the Rolling 20 policy binds, these are added with a 20 year life; Under the 2048 Constraint, the 2048 constraint itself is less than 20 years away as of 2029/30 and so new assets come in with a 17-19 year asset life. However, this is a small fraction of the total RAB, so the differences are negligible.
- In UT7, tariffs with the 2048 Constraint are around \$0.5/tonne higher than with the 2055 Constraint. This is because as of UT7, the 2048 constraint binds, and asset lives do not jump up to 20 years at the beginning of the period, as they do with a 2055 constraint and the Rolling 20 policy.
- In UT8, the policies equalise with the "correct" 2055 constraint, because it is now evident that the network will see significant usage indefinitely under the Base Case scenario. However, because of the amount of depreciation that had been accelerated during UT7 with the 2048 Constraint, the tariffs under that policy design immediately drop, as most assets jump from 11 years remaining (from 2036/37 to 2048) to 17. As a result, tariffs are around \$0.4/tonne lower in UT8 and UT9 under the 2048 Constraint.
- The lower tariffs in the later years of 2048 Constraint happen at a time when tariffs are rising generally, as the 2055 constraint approaches.

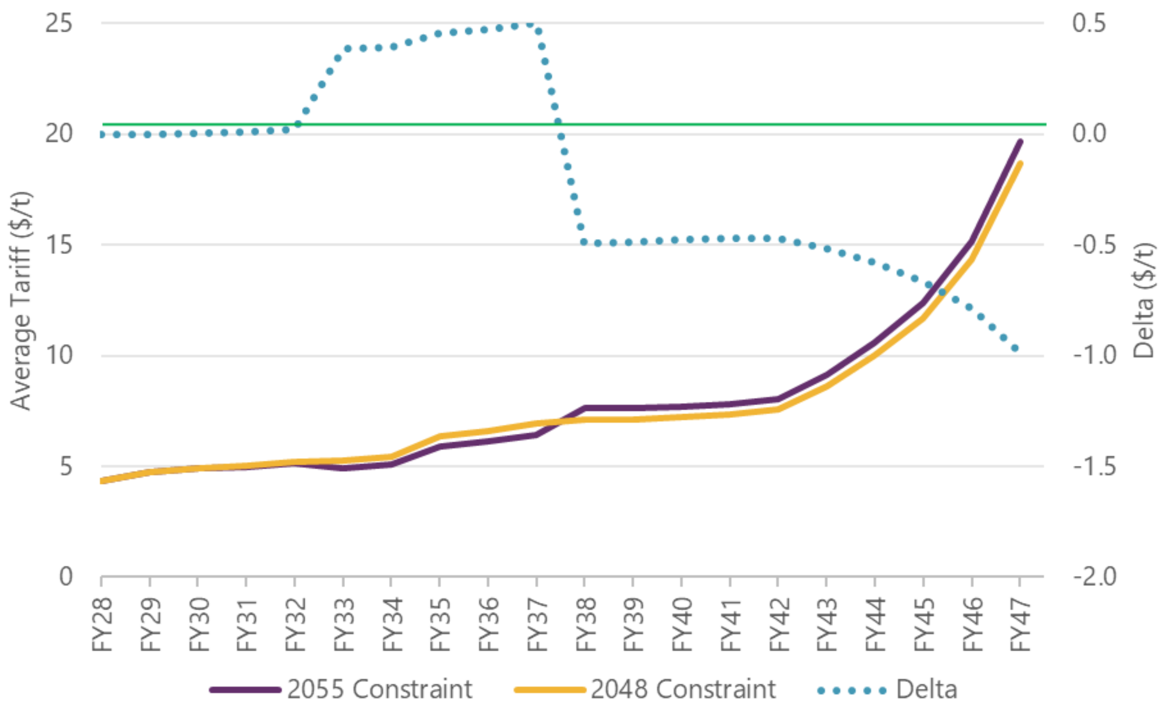
Next, we show the same for the Accelerated WAML scenario, in Figure 6.9 and Figure 6.10 below.

Figure 6.9: MAR and Demand, Accelerated WAML (Moura)



Source: NERA Analysis

Figure 6.10: Moura Tariffs, Accelerated WAML



Source: NERA Analysis

Several patterns emerge from these figures:

- Like in the Base Case, tariffs are virtually identical under both policies in UT6, because the global economic constraint only binds on assets added during the final three years of the period.
- Also as in the Base Case, tariffs under the 2055 Constraint policy drop slightly at the beginning of UT7, as asset lives for most of the RAB jump up to 20 years. This same effect does not happen with the 2048 Constraint because the economic constraint already binds.
- Starting from FY2035 and continuing to the end of the modelled period, tariffs steadily increase as volumes start to fall off, particularly during UT9.
- As of UT8 in FY2038, tariffs in the 2055 Constraint "correct" to assume a 2048 economic constraint, equalising in policy to the 2048 Constraint. However, this policy has fallen behind by delaying depreciation, and so tariffs are higher to recover a larger remaining RAB.

6.4. Conclusions

In Table 6.1 below, we synthesise the levels and differences in CQCN tariffs across the three CQCN scenarios, and averaged into five-year undertaking periods.

Table 6.1: Average CQCN Tariff Levels by Undertaking Period

	UT6	UT7	UT8	UT9
Base Case				
Existing Approach	4.72	4.94	4.98	5.26
Proposed Approach	4.92	5.00	4.95	5.09
Delta	0.20	0.07	-0.03	-0.17
Carbon Constrained				
Existing Approach	4.90	5.57	6.02	6.27
Proposed Approach	5.11	5.64	5.97	6.05
Delta	0.21	0.07	-0.05	-0.22
Carbon Shock				
Existing Approach	5.06	7.44	9.03	10.53
Proposed Approach	5.28	7.51	8.89	10.03
Delta	0.21	0.07	-0.14	-0.50

From the table above, we conclude the following:

- If something resembling the Base Case materialises, then we expect CQCN tariffs to be relatively stable, irrespective of the Capital Recovery Approach. While there are some minor differences in the shape of the tariff, these are unlikely to be a material concern to users of CQCN. In large part, this is a reflection of the limited nature of Aurizon's proposal.
- In all scenarios, the Proposed Approach would initially add about $0.20 to the tariff, in exchange for a much more varied savings in the tariffs in the later years. This reflects that, across scenarios, near-term demand is high and much easier to predict. As a result, the well-understood and sizeable customer base today is better able to absorb an increase in the MAR today compared to the future customer base which is highly uncertain and may prove to be much smaller.
- In the more negative cases, like the Carbon Shock scenario, tariffs increase substantially under both approaches in the final period, but by materially more under the Existing Approach. We expect that in these scenarios, further policy changes would be required to ensure that the full remaining value of CQCN is not paid for only by the few remaining customers in the few remaining years (which in any case would probably create a demand death spiral in the face of these high tariffs). We do not speculate what kind of intervention would occur, but irrespective of its precise design, it will be cheaper for billpayers and/or taxpayers if some of the asset recovery has been frontloaded in the way that Aurizon proposes.

In Table 6.2 below, we do the same for the two Moura scenarios.

Table 6.2: Average Moura Tariff Levels by Undertaking Period ($/tonne)

	UT6	UT7	UT8	UT9
Base Case				
2055 Constraint	4.83	5.23	5.83	7.40
2048 Constraint	4.84	5.65	5.50	7.08
Delta	0.01	0.41	-0.33	-0.32
Accelerated WAML				
2055 Constraint	4.83	5.69	7.77	13.39
2048 Constraint	4.84	6.13	7.29	12.68
Delta	0.01	0.44	-0.48	-0.71

From the table above, we conclude the following:

- Across both scenarios, the tariff from the 2048 Constraint is virtually identical to that from the 2055 Constraint during UT6, higher in UT7, and lower in UT8 and UT9.
- If something resembling the Base Case materialises, then we expect tariffs to be relatively stable, though increasing in UT9 as the Global Economic Constraint approaches. Even though it is not the "correct" approach given the indefinite use of the Moura network in the Base Case, the 2048 Constraint actually produces a more stable price path, as it moderates some of the increase in UT9.
- If something resembling the Accelerated WAML scenario materialises, then tariffs will increase significantly under either policy design, but less so with the 2048 Constraint. In this case, the tariff reductions during UT8 and UT9 and larger than the tariff increase in UT7, relative to the 2055 Constraint tariffs.

Across both of the above tables, it is not possible to know at this stage which path of the above (or any other) we are on, but the Proposed Approach produces better outcomes across all of these scenarios:

- Even in an outlook of enduring use of CQCN (i.e. Base Case conditions), a modest frontloading of revenues would not materially harm customers today. In fact, in every single case we model, the accelerated depreciation that Aurizon proposes (including the 2048 Accelerated WAML) serves to flatten tariffs that would otherwise increase under the Existing Approach. In no case does the Proposed Approach produce *decreasing* tariffs over time, which could be a sign of a policy that goes too far to accelerate depreciation. Thus, even under Base Case conditions, the Proposed Approach produces a more stable and predictable tariff path than the Existing Approach, and which may be preferable to Aurizon's customers (particularly those which operate on longer time horizons).
- On the other hand, in an outlook of rapidly declining use of the network, the Proposed Approach could substantially reduce the burden faced by the few remaining users of the service, or investors in the rail network which could be required to bear the cost of the stranded assets.

Thus, we conclude that the Proposed Approach is a pragmatic approach to dealing with the uncertain outlook of CQCN, with limited material downsides.

QUALIFICATIONS, ASSUMPTIONS, AND LIMITING CONDITIONS

This report is for the exclusive use of the NERA client named herein. This report is not intended for general circulation or publication, nor is it to be reproduced, quoted, or distributed for any purpose without the prior written permission of NERA. There are no third-party beneficiaries with respect to this report, and NERA does not accept any liability to any third party.

Information furnished by others, upon which all or portions of this report are based, is believed to be reliable but has not been independently verified, unless otherwise expressly indicated. Public information and industry and statistical data are from sources we deem to be reliable; however, we make no representation as to the accuracy or completeness of such information. The findings contained in this report may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties. NERA accepts no responsibility for actual results or future events.

The opinions expressed in this report are valid only for the purpose stated herein and as of the date of this report. No obligation is assumed to revise this report to reflect changes, events, or conditions, which occur subsequent to the date hereof.

All decisions in connection with the implementation or use of advice or recommendations contained in this report are the sole responsibility of the client. This report does not represent investment advice nor does it provide an opinion regarding the fairness of any transaction to any and all parties. In addition, this report does not represent legal, medical, accounting, safety, or other specialized advice. For any such advice, NERA recommends seeking and obtaining advice from a qualified professional.

NERA
One International Towers
100 Barangaroo Avenue
Sydney NSW, Australia 2000
www.nera.com