ACIL ALLEN

09 August 2022
Report to APA

VTS accelerated depreciation assessment

Public Report

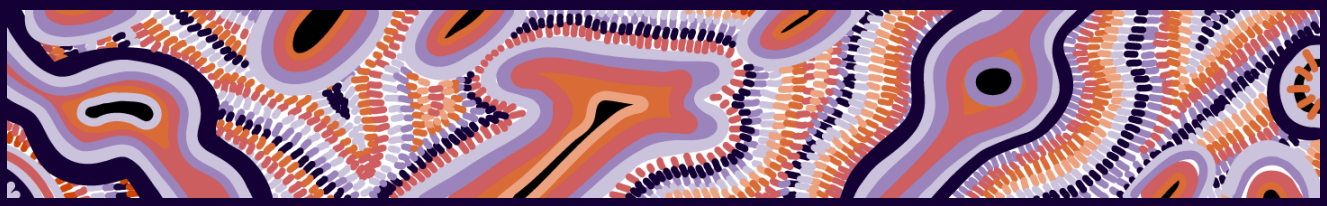
About ACIL Allen

ACIL Allen is a leading independent economics, policy and strategy advisory firm, dedicated to helping clients solve complex issues.

Our purpose is to help clients make informed decisions about complex economic and public policy issues.

Our vision is to be Australia's most trusted economics, policy and strategy advisory firm. We are committed and passionate about providing rigorous independent advice that contributes to a better world.

ACIL Allen acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land and its waters. We pay our respects to Elders, past and present, and to the youth, for the future. We extend this to all Aboriginal and Torres Strait Islander peoples reading this report.



Goomup, by Jarni McGuire

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1 Introduction

APA submitted its gas access arrangement proposal for the VTS in December 2021. In the proposal, APA proposed capping all asset lives at 30 years and an expected inflation rate of 2.00% per annum over 2023-27, anticipating falling gas demand on the VTS over time.

In its draft decision, the AER did not accept APA's proposal for capping the asset lives at 30 years. It also imposed a higher expected inflation rate of 2.87% per annum over 2023-27. Both of these decisions affect the rate at which the VTS is depreciated.

Longer asset lives mean that annual straight-line depreciation is lower as it is calculated as the commissioned asset value divided by the asset life. Nominal straight-line depreciation is calculated as straight-line depreciation in real dollars (at the start of the access arrangement period), escalated each year by the cumulative rate of inflation from the beginning of the access arrangement period.

Regulatory depreciation is calculated as nominal straight-line depreciation less the annual CPI escalation of the opening real regulated asset base. Higher inflation pushes depreciation (reflected in revenues as return on capital) to later years. Where gas demand is expected to fall over time (e.g., as policies are implemented to decarbonise the energy system), average customer tariffs in later years would be expected to be substantially higher. Therefore, higher inflation rates can impose unreasonably high tariffs on "vulnerable customers"[1] in later years of the VTS life.

The AER recognised that there "is significant uncertainty as to the future of gas pipelines in Victoria given the commitment for net zero emissions by 2050 from the Victorian government"[2]. However, the AER considered that APA did not provide sufficient justification that the accelerated depreciation of the VTS is warranted during the 2023-27 access arrangement.

APA engaged ACIL Allen to assess whether accelerated depreciation was warranted on the Victorian Transmission System (VTS) and determine the basis for adjusting depreciation. A significant factor in further considering the issue of accelerated depreciation is a significant change in gas demand forecasts for the VTS between the 2021 and 2022 GSOO forecasts and the increase in the likelihood of substantial declines in gas demand beginning within the 2023-27 access period.

APA asked ACIL Allen to incorporate the following into the assessment:

— Three different gas demand scenarios, two of which are based on AEMO's Progressive Change and Step Change scenarios and a hybrid Delayed Step Change scenario.

[1] Vulnerable customers are those with limited or no alternatives to consuming pipeline gas, or customers that may not have the financial capacity to switch to alternative fuels.

[2] AER (June 2022), Draft Decision: APA Victorian Transmission System (VTS) Access Arrangement 2023 to 2027 – Attachment 4 Regulatory depreciation, p. 15.

- Extract the VTS capital base, capital expenditure for 2023-27 and the asset lives from the PTRM.
- Include $20 million ($2022) per annum stay in business capital from 2028 to 2058 with an asset life of between five and ten years
- Establish a depreciation schedule that maintains a constant average tariff (in $2022) on the VTS to 2058 – covering the remaining asset life of existing assets. The average tariff is defined as the annual revenue from the return to and return of capital, all divided by the projected annual gas demand on the VTS for each calendar year.
- Ensure that the present value of revenues (return to capital and return of capital) to 2058, under each scenario, is the same as the case where no changes are made to the depreciation schedule.

The remainder of the report is structured as follows:

- Chapter 2 sets out our methodology
- Chapter 3 provides the results of our analysis and our conclusions.
- Appendix A provides tables showing detailed results for each scenario.

2 Methodology

ACIL Allen's approach to the assessment was as follows:

- Develop the projected annual gas demands from 2023 to 2058 for the three scenarios
- Extract the current asset base, the remaining asset lives, and the proposed new assets expenditure and lives from the AER draft decision PTRM, 30 June 2022.[3]
- Replicate the revenue and depreciation schedules in the VTS PTRM
- Add stay-in-business capital from 2028 and depreciation of that capital
- Determine the annual average tariffs for the VTS PTRM depreciation schedule to 2058
- Calculate the constant annual average tariff ($2022) that provides the same present value of revenues for the VTS between 2023 and 2058
- Sculpt regulatory depreciation to fit within the constant annual tariff constraint.

The methodology is explained in more detail below.

2.1 Gas demand scenarios

Future gas demand is the most significant uncertainty in the assessment. ACIL Allen drew on the AEMO GSOO 2022 forecasts for the VTS in developing the demand scenarios. The Progressive Change and Step Change are as projected by AEMO. The Delayed Step Change scenario is a hybrid of the Progressive Change and Step Change scenarios. The first five years to 2027 are the Progressive Change projections. From 2028, the gas demand projections are replaced by the Step Change projections but delayed five years. Therefore, the 2028 annual gas demand in Delayed Step Change is the same as the 2023 annual gas demand in Step Change, the 2029 annual gas demand in Delayed Step Change is the same as the 2024 annual gas demand in Step Change and so on.

The gas demand projections are made up of the following components:

- Residential and commercial consumption
- Hydrogen production consumed domestically via the VTS
- Industrial consumption
- Gas for power generation
- Losses

For the extension of the projections between 2042 and 2058, ACIL Allen used the following approaches for each segment:

[3] Workbook *AER - Draft Decision - APA VTS 2023-27 Access Arrangement - PTRM - June 2022,* retrieved on 8 July 2022 from https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/apa-victorian-transmission-system-access-arrangement-2023%E2%80%9327/draft-decision

- Gas for power generation was assumed to fall to around 5 PJ/a in the late-2040s and stabilise at that level – reflecting gas-fired peaking plant being retained to provide firming and back-up in the electricity system in Victoria.
- Domestic hydrogen demand is projected to grow, reflecting slower rates of electrification of gas demand and greater opportunity for hydrogen to compete as the cost of hydrogen production falls.
- Residential and Commercial demand is projected to fall to zero by the early- to mid-2050s, consistent with a net zero emissions policy and the growth and availability of domestic hydrogen in these scenarios.
- Industrial demand, reflecting most of the gas demand that is both highly price sensitive and difficult to convert to alternatives, is projected to be retained through 2058 with some gradual reduction in demand. Industrial demand in 2058 varies between 30 and 45 PJ across the scenarios.
- Losses are calculated as around 2 per cent of the aggregate demand each year.

The Delayed Step Change scenario segments follow the Step Change segments but are delayed five years.

Figure 2.1 below shows the demand by segment for each scenario used in the assessment.

2.2 PTRM Revenue and depreciation

The starting point for the assessment was the current asset base and the proposed new asset expenditure from the PTRM. ACIL Allen extracted all of the necessary data from the PTRM to replicate the revenue and depreciation schedules, including:

- Asset values and asset lives
- New asset investment profile and lives
- Assumed inflation, cost of equity, cost of debt and WACC

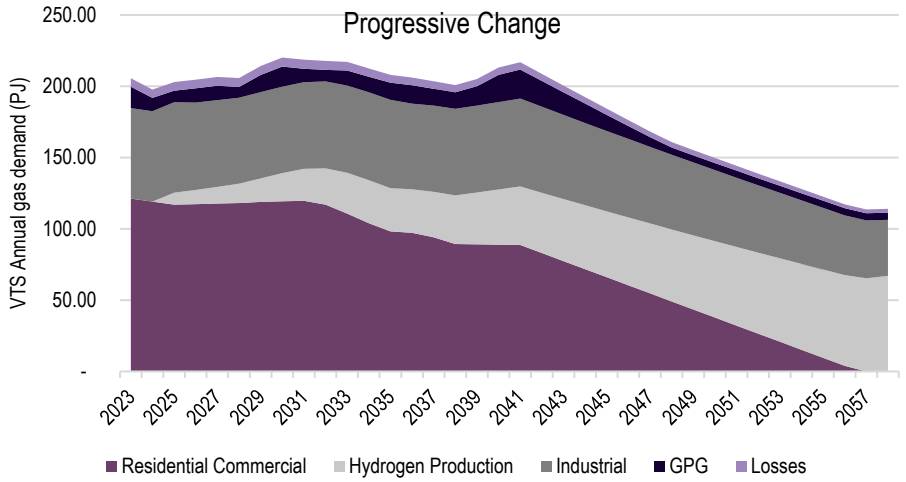
This information was used to replicate the PTRM results.

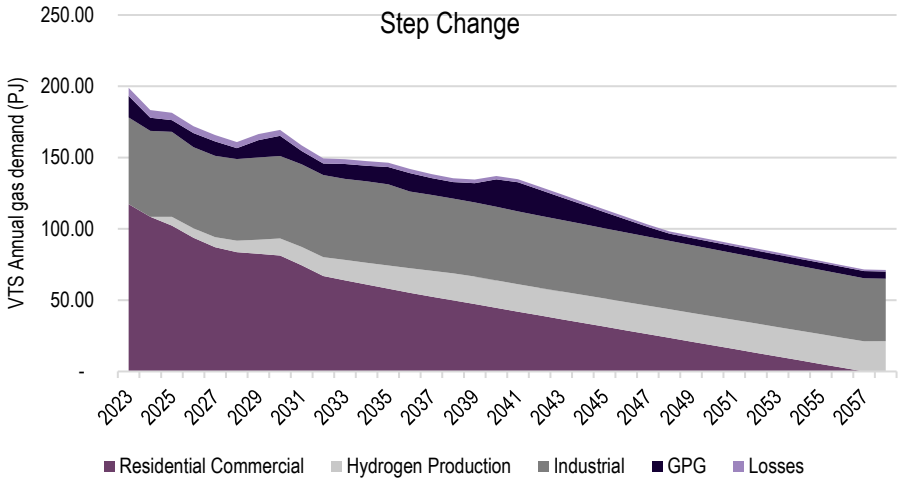
Once the PTRM results were replicated, an additional $20 million ($2022) of stay-in-business capital was added to the schedules. The revised revenue and depreciation schedules (from 2028) were then calculated and updated.

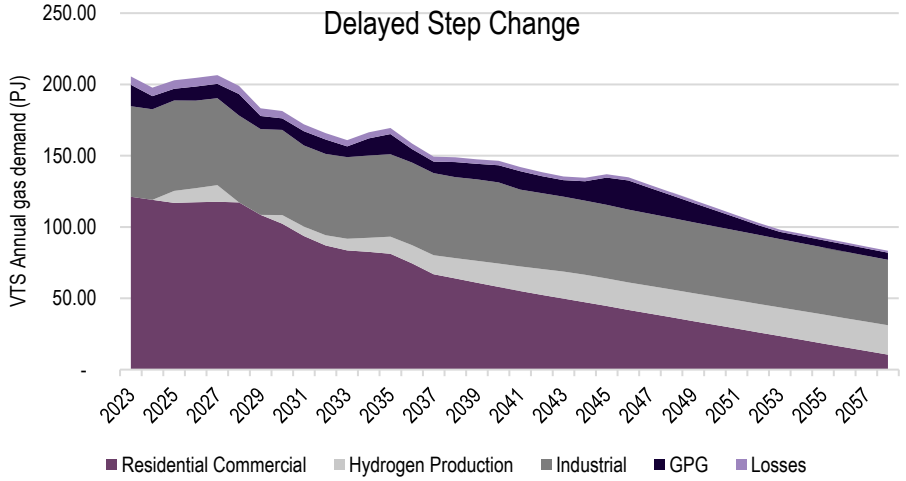
2.3 PTRM annual average tariffs

Next, the PTRM annual average tariffs were calculated by dividing the total revenue (from capital) by the projected gas demand each year (for each scenario). These nominal tariffs were then converted to real ($2022) ones by dividing by the CPI escalation factor applying to each year.

Figure 2.1 Gas demand scenarios used in the assessment







Note: AEMO GSOO Projections to 2041 and ACIL Allen extension of the projections to 2058

Source: AEMO GSOO 2022 and ACIL Allen

2.4 Constant annual average tariffs

The next step in the process was to determine the constant annual average tariff ($2022), where the present value of the revenues for the VTS between 2023 and 2058 was the same as the PV of the revenues calculated in section 2.2 above.

The constant annual average tariff was calculated using the solver function in excel.

The constant annual average tariff variable was converted to a set of escalated nominal tariffs (one for each year) and constrained to be greater than zero. The initial value of the constant annual average tariff variable was set to the value for 2023 from section 2.3 above.

The difference between the escalated nominal tariff and the nominal tariff from section 2.3 above was calculated for each year. These were then multiplied by the annual gas demand to calculate each year's initial regulatory depreciation adjustment.

The solver function was then used to find the constant annual average tariff, where the present value of the initial regulatory depreciation adjustments was zero. This calculation maintains the present value of revenues for the VTS between 2023 and 2058, the same as those calculated in section 2.2 above.

2.5 Sculpt regulatory depreciation

Adjusting the regulatory depreciation also changes the nominal residual capital base used to calculate the returns to capital. Increases in regulatory depreciation reduce the nominal residual capital base and return to capital in subsequent years (and vice versa). Therefore, the final step adjusts the regulatory depreciation to maintain the constant annual average tariff each year. This further adjustment compensates for changes in returns to capital from the changed nominal residual capital base.

The final tariff sculpting was a straightforward process of making an additional adjustment each year to regulatory depreciation to maintain the constant annual average tariff constraint (reflected each year in nominal terms). The adjustment was made one year at a time, from the earliest to the latest year. The adjustment in each year flowed forward to subsequent years (changes to the nominal residual capital base). Once completed, the present value of the revised revenues was the same as the present value of the revenues in section 2.2 above.

3 Results

This section sets out the results and our conclusions from the assessment. The results include the existing PTRM outputs and the adjusted outputs for the four scenarios.

The inflation rate used in the analysis is 2.87 per cent – as set out in the PTRM.

Present values have been calculated from nominal dollars using a nominal discount rate of 5.32 per cent as in the PTRM.

3.1 Results

Figure 3.1 shows the annual average tariffs ($2022) for each scenario (without regulatory depreciation sculpting) and the equivalent constant annual average tariff following sculpting of the regulatory depreciation. The annual average tariffs are calculated by dividing the annual revenue requirement by the projected annual gas demand.

The annual average tariffs are the highest in the Step change scenario and lowest in the Progressive change scenario. This result is because the projected demand for Progressive change is significantly higher in the Step change scenario. The annual average tariffs for the Delayed step change scenario are the same as the Progressive change scenario for the first five years because it has the same gas demand as Progressive change in those years. The Delayed step change annual average tariffs then rise to sit between the other two scenarios, as is expected because gas demand from 2028 is Step change demand with a five-year delay.

The constant annual average tariffs were calculated using the methodology in section 2.4 above.

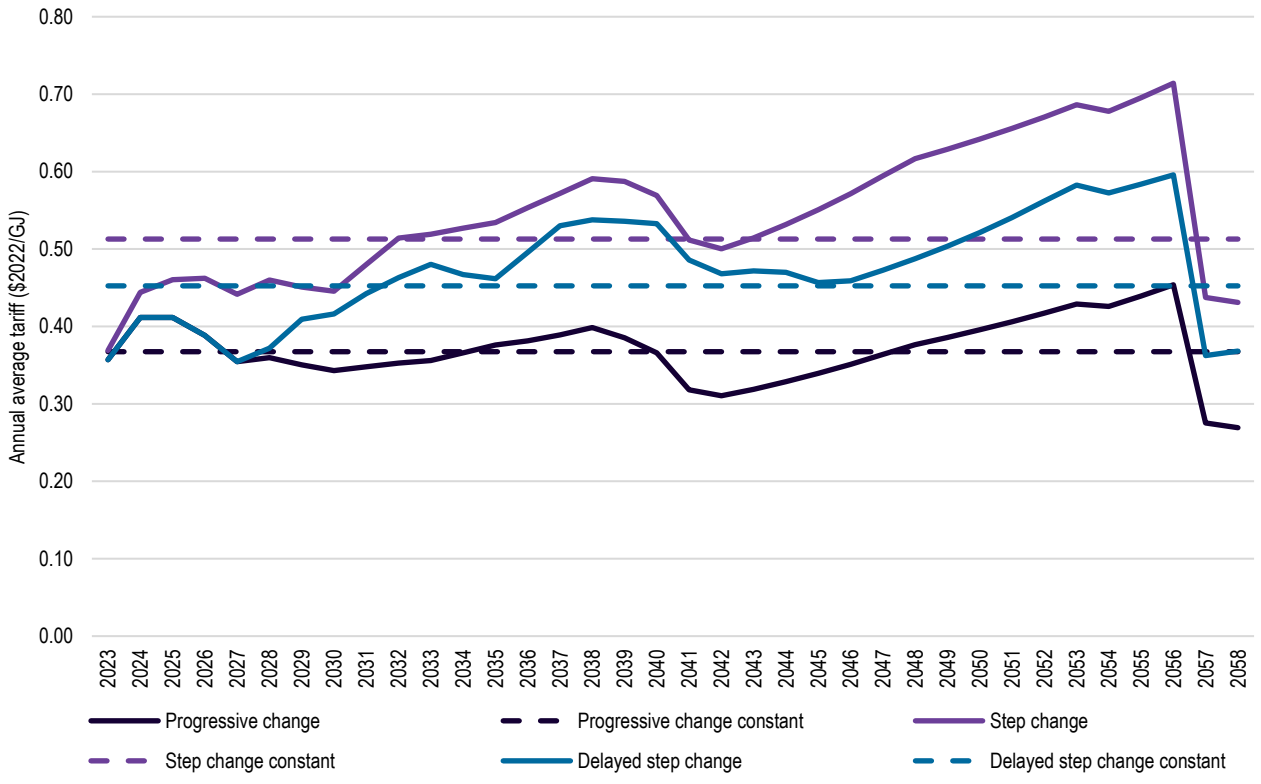
The constant annual average tariff for the Progressive change scenario is $0.367/GJ ($2022). As gas demand remains relatively stable until at least 2040 in this scenario, the constant average annual tariff is close to the annual average tariffs until that point in time. If the progressive change scenario reflected the future to 2058, there would be little need to adjust depreciation schedules to protect vulnerable customers.

The constant annual average tariff for the Step change scenario is $0.513/GJ. This value is significantly higher than the annual average tariffs until 2030 but is much lower than the annual average tariffs after 2035.

The constant annual average tariff for the Delayed step change scenario is $0.452/GJ. This value is higher than the annual average tariffs until 2030 but much lower than the annual average tariffs from 2037.

The results for the Step change and Delayed step change scenarios show that should the future reflect either of these scenarios, adjusting depreciation schedules in early years protects vulnerable customers in later years against significant tariff increases. Therefore, acting during the 2023-27 access arrangement period avoids the need for much larger tariff impacts on vulnerable customers in the future.

Figure 3.1 Annual average tariffs and constant annual average tariffs by scenario ($2022)



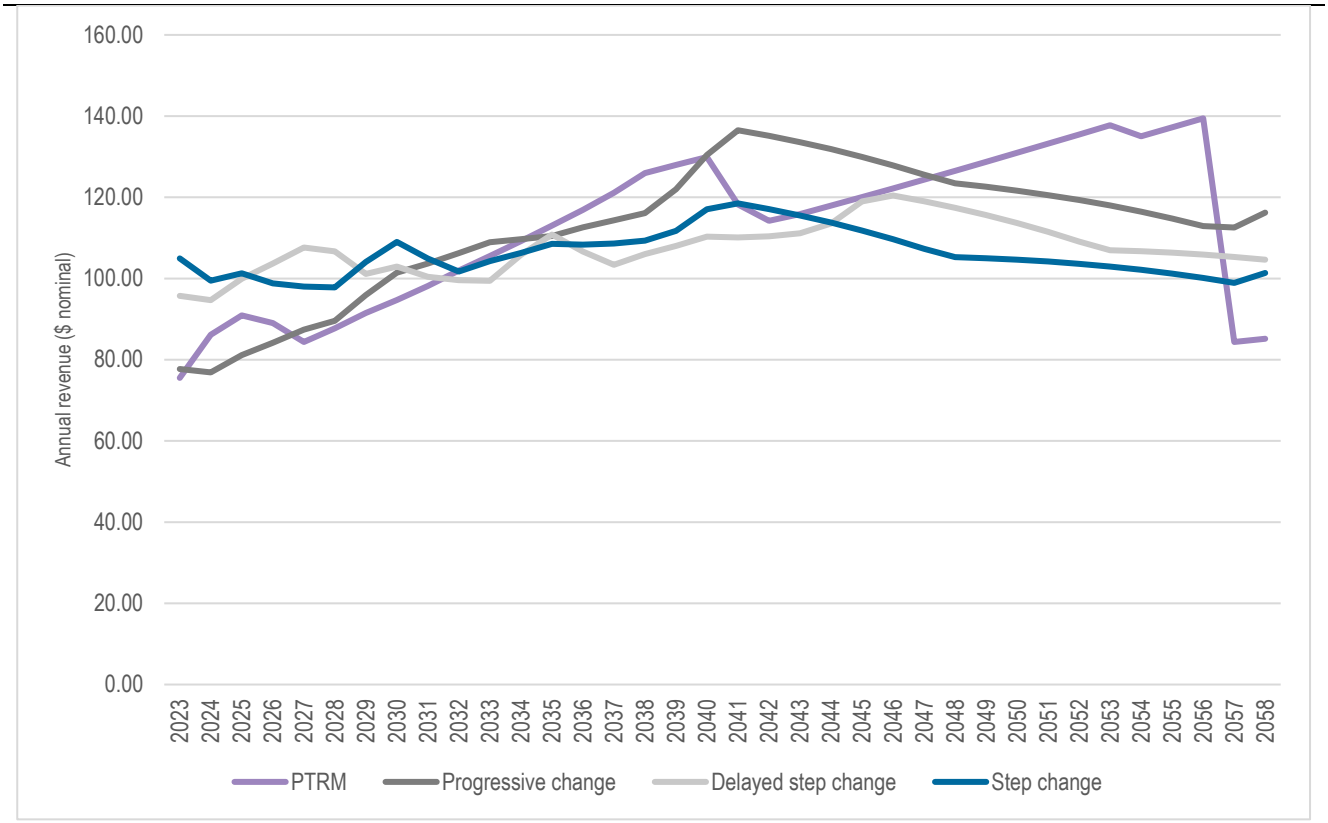
Source: ACIL Allen

Figure 3.2 shows the projected annual revenues to 2058 for the PTRM and the three scenarios after the sculpting of regulatory depreciation to create constant annual average tariffs each year.

As is expected, the effect of sculpting regulatory depreciation is to bring forward depreciation in the scenarios where demand is projected to fall away more rapidly. In the Delayed step change and Step change scenarios, revenues are higher until around 2030, reflecting some acceleration of regulatory depreciation, and then lower after that.

However, sculpting also removes some of the volatility in the revenues and, therefore, annual average tariffs. This characteristic can be observed in the sculpted Progressive change earnings profile compared with the PTRM. The PTRM has a significant fall in revenues around 2041. The revenues then grow substantially until 2056 before dropping again in 2057 and 2058. This volatility flows through to annual average tariffs. The Progressive change sculpted revenues follow a smoother trajectory in rising to 2041 and then another smooth trajectory as they fall towards the end of the period studied. As a consequence of the sculpting methodology, volatility is removed in the annual average tariffs (constant at $0.367/GJ in $2022)

Figure 3.2 Annual revenues ($ nominal)



Source: ACIL Allen

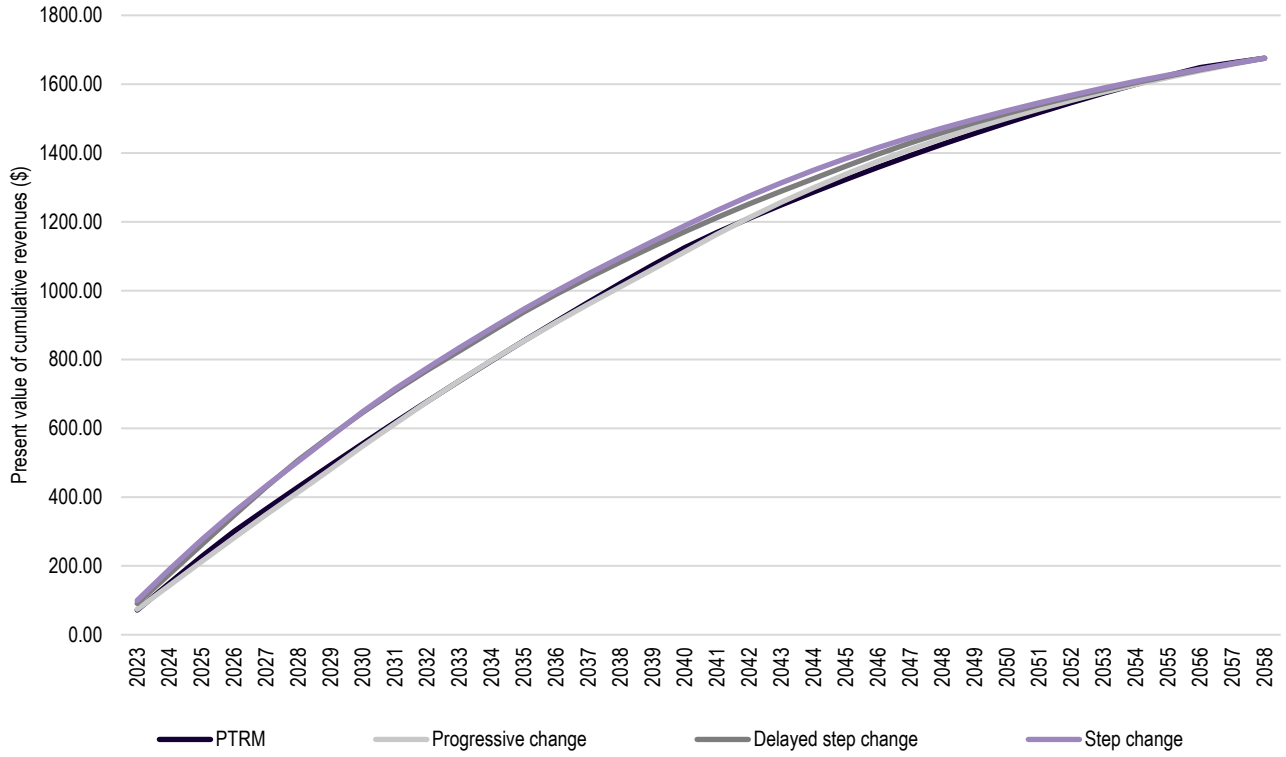
Figure 3.3 shows the present value of the projected cumulative revenues under the PTRM and the three scenarios with sculpted regulatory depreciation. The WACC of 5.32 per cent was used in calculating the present values.

The Step change and the Delayed step change scenarios with sculpted depreciation collect more revenue in present value terms in the earlier years than the PTRM and the Progressive change with sculpted depreciation.

However, the effect of earlier depreciation reduces the residual asset base, so around 2035, the result is reversed. From that time, Progressive change and the PTRM collect more revenue in present value terms.

The chart also shows that the revenue collected is the same for all four cases in present value terms (the present value of revenue collected between 2023 and 2058 is calculated as 1,675 million dollars in all cases).

Figure 3.3 Cumulative annual revenues ($2022)



Source: ACIL Allen

Figure 3.4 shows the projected closing RAB ($2022) each year for the PTRM and each scenario, including sculpted regulatory depreciation.

As expected, the closing RAB falls faster in scenarios with higher regulatory depreciation in earlier years (Step change and Delayed step change).

The closing RAB in 2058 for each case is:

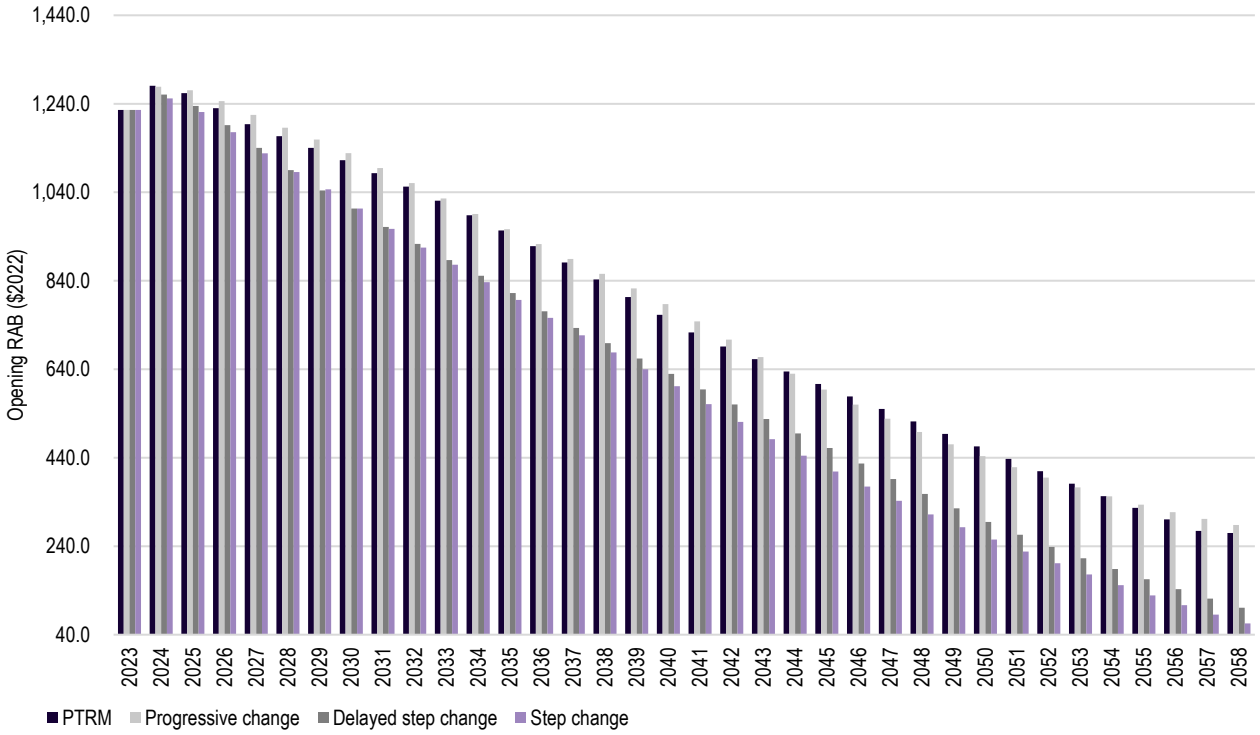
— $265.6 million for the PTRM without adjustment

— $273.5 million for the Progressive change scenario after sculpting of regulatory depreciation

— $81.0 million for the Delayed step change scenario after sculpting of regulatory depreciation

— $44.9 million Step change scenario after sculpting of regulatory depreciation

Figure 3.4 Opening RAB ($2022)



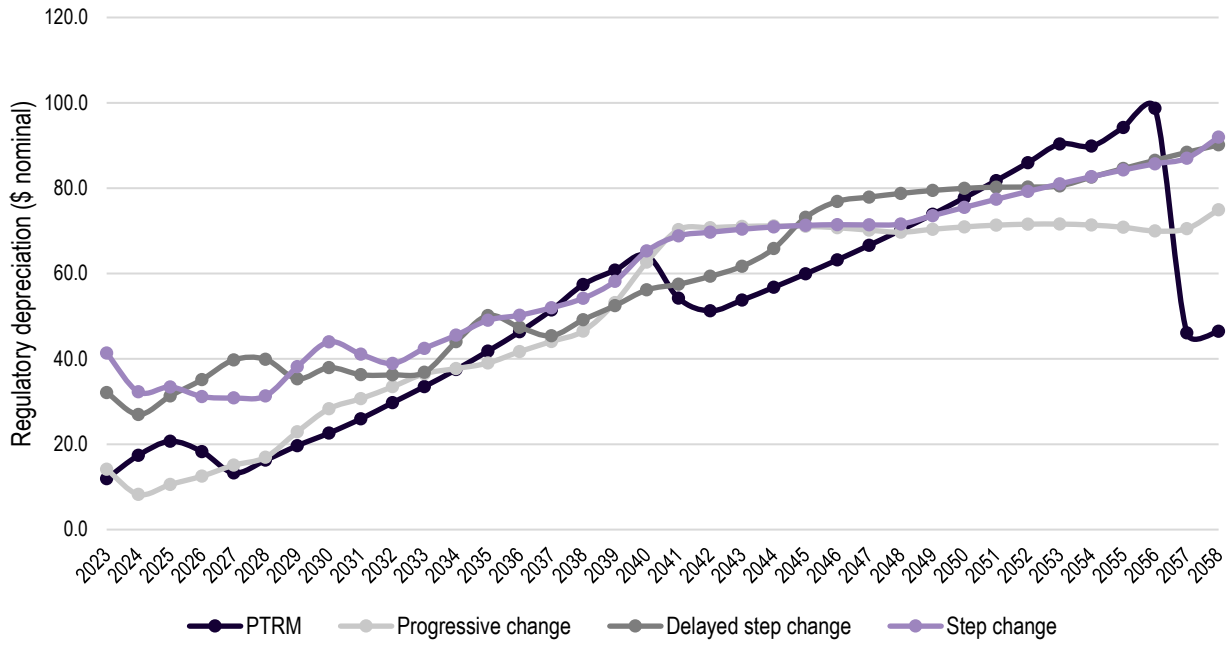
Source: ACIL Allen

Figure 3.5 shows the projected regulatory depreciation for the PTRM and each scenario after sculpting regulatory depreciation.

Regulatory depreciation is higher in the Step change and Delayed step change scenarios, consistent with the above results.

The sculpting also reduces volatility in the regulatory depreciation. This reduction in volatility is especially noticeable in comparing the Progressive change scenario with the un-sculpted PTRM projected regulatory depreciation.

Figure 3.5 Regulatory Depreciation ($ nominal)



Source: ACIL Allen

3.2 Conclusions

The current AER methodology of calculating annual regulatory depreciation starts with straight-line depreciation for each year. It then reduces the straight-line depreciation by the amount the residual capital base inflates each year (CPI). This process has the effect of pushing depreciation of the asset base into later years. The AER clearly understands this issue, as was explained in its response[4] to APA's proposal to accelerate depreciation as part of the VTS access arrangement proposal submitted in December 2021.

The AER approach to calculating regulatory depreciation is reasonable where the likely utilisation of a set of regulated assets is expected to be consistent over the accepted regulatory life of those assets. In such circumstances, future users would be expected to be charged tariffs consistent with the value they derive from using the assets relative to current users.

However, where the utilisation of the assets is expected to fall substantially over time, future users will be expected to be charged tariffs at a disproportionately high level for the value they derive from the assets compared with current users. In ACIL Allen's opinion, the faster the likely fall in utilisation and the more uncertain the timing of the fall, the more likely that the current approach will result in future more vulnerable customers being charged excessively high tariffs.

The VTS faces significant uncertainty concerning future natural gas demand. Natural gas usage produces substantial greenhouse gas emissions. Australia and Victoria have committed to achieving net zero emissions by 2050. In this environment, it is unlikely that gas shipped on the VTS will continue as usual.

As our energy systems are decarbonised, gas demand in Victoria may remain stable for a period before falling. This outlook appears to be the primary thesis of the AEMO Progressive change scenario. However, in ACIL Allen's view, it is more likely that earlier efforts to decarbonise our energy systems will be made, which is more consistent with AEMO's Step change scenario.

Current Commonwealth Government policy is for a 43 per cent cut in emissions by 2030. This target will require earlier efforts to decarbonise the energy sector compared with other sectors. This is because the cost of decarbonising other sectors, including industry and agriculture, is higher, and those sectors have fewer ready-made technological solutions.

In addition, the Victorian Government is developing its policy suite to decarbonise the Victorian economy. Electricity and residential and commercial gas usage will most likely be decarbonised first because technologies are readily available, and costs are low compared with other sectors. The policy suite could include the Victorian Government offering subsidies to switch from natural gas to electricity and possibly regulations preventing or limiting some consumers from gaining access to natural gas (e.g., greenfield and brownfield connections, etc.).

This report's Delayed step change scenario appears to be a reasonable middle ground for projecting the future gas demand on the VTS. The first five years are relatively stable and are the same as in the Progressive change scenario. From year six (two years before Australia must meet its 43 per cent emissions reduction target), gas demand is projected to decline rapidly as residential and commercial demand predominantly switches to electricity.

Assuming that the Delayed step change scenario is a better projection of gas demand than the Progressive change scenario, the AER could defer accelerating depreciation until the future direction of gas demand on the VTS is more certain. However, ACIL Allen's analysis shows that not taking the opportunity to bring forward depreciation in the early years, when gas demand is higher, will impose much higher costs on the more vulnerable consumers later.

[4] AER (June 2022), *Draft Decision: APA Victorian Transmission System (VTS) Access Arrangement 2023 to 2027 – Attachment 4 Regulatory depreciation*, p. 11.

Acting now (from the start of the 2023-2027 access arrangement) by making relatively modest increases in tariffs on all customers today, avoids making much more significant tariff adjustments in the future, which at that time will be borne by the most vulnerable customers.

A Detailed results

This appendix provides the annual projections of key regulatory outputs for the PTRM and the four scenarios in which the regulatory depreciation has been adjusted

— The PTRM outputs (no regulatory depreciation adjustment) are shown in Table A.1.
— The results for the Progressive change scenario are shown in Table A.2
— The results for the Step change scenario are shown in Table A.3
— The results for the Delayed step Change scenario are shown in Table A.4

Table A.1 PTRM results – no regulatory depreciation adjustment

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2023	1,226.2	100.2	-45.9	1,280.6	35.2	-47.2	-11.9	1,317.4	63.6	11.9	75.5
2024	1,280.6	35.6	-52.2	1,263.9	37.9	-55.3	-17.4	1,337.6	68.7	17.4	86.2
2025	1,263.9	20.5	-54.3	1,230.2	38.5	-59.1	-20.7	1,339.3	70.2	20.7	90.9
2026	1,230.2	14.4	-50.7	1,193.9	38.5	-56.8	-18.3	1,337.2	70.8	18.3	89.0
2027	1,193.9	17.7	-44.9	1,166.7	38.4	-51.7	-13.3	1,344.3	71.1	13.3	84.4
2028	1,166.7	20.0	-46.3	1,140.4	38.6	-54.9	-16.3	1,351.8	71.5	16.3	87.7
2029	1,140.4	20.0	-48.0	1,112.4	38.9	-58.5	-19.7	1,356.5	71.9	19.7	91.5
2030	1,112.4	20.0	-49.1	1,083.3	39.0	-61.6	-22.6	1,359.0	72.1	22.6	94.7
2031	1,083.3	20.0	-50.4	1,052.9	39.1	-65.0	-26.0	1,358.8	72.2	26.0	98.2
2032	1,052.9	20.0	-51.8	1,021.1	39.1	-68.8	-29.7	1,355.6	72.2	29.7	102.0
2033	1,021.1	20.0	-53.1	988.0	39.0	-72.5	-33.5	1,349.5	72.1	33.5	105.5
2034	988.0	20.0	-54.3	953.7	38.8	-76.3	-37.5	1,340.1	71.7	37.5	109.2
2035	953.7	20.0	-55.6	918.2	38.5	-80.3	-41.8	1,327.2	71.2	41.8	113.0
2036	918.2	20.0	-56.8	881.3	38.2	-84.5	-46.3	1,310.6	70.5	46.3	116.9
2037	881.3	20.0	-58.3	843.1	37.7	-89.1	-51.5	1,289.7	69.7	51.5	121.1
2038	843.1	20.0	-60.0	803.1	37.1	-94.5	-57.4	1,263.8	68.6	57.4	126.0
2039	803.1	20.0	-60.0	763.1	36.3	-97.1	-60.8	1,235.4	67.2	60.8	128.0
2040	763.1	20.0	-59.9	723.2	35.5	-99.7	-64.2	1,204.5	65.7	64.2	129.9
2041	723.2	20.0	-51.8	691.3	34.6	-88.8	-54.2	1,184.5	64.0	54.2	118.2
2042	691.3	20.0	-48.4	662.9	34.1	-85.3	-51.2	1,168.5	63.0	51.2	114.2
2043	662.9	20.0	-48.2	634.8	33.6	-87.4	-53.8	1,151.0	62.1	53.8	115.9
2044	634.8	20.0	-48.2	606.6	33.1	-89.9	-56.8	1,131.6	61.2	56.8	118.0
2045	606.6	20.0	-48.2	578.4	32.5	-92.5	-59.9	1,110.0	60.1	59.9	120.1

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2046	578.4	20.0	-48.2	550.2	31.9	-95.1	-63.2	1,086.3	59.0	63.2	122.2
2047	550.2	20.0	-48.2	522.1	31.2	-97.8	-66.6	1,060.3	57.7	66.6	124.4
2048	522.1	20.0	-48.2	493.9	30.5	-100.7	-70.2	1,031.9	56.4	70.2	126.5
2049	493.9	20.0	-48.2	465.7	29.7	-103.5	-73.9	1,001.0	54.9	73.9	128.7
2050	465.7	20.0	-48.2	437.5	28.8	-106.5	-77.7	967.5	53.2	77.7	131.0
2051	437.5	20.0	-48.2	409.4	27.8	-109.6	-81.8	931.2	51.4	81.8	133.2
2052	409.4	20.0	-48.2	381.2	26.8	-112.7	-86.0	892.1	49.5	86.0	135.5
2053	381.2	20.0	-48.2	353.0	25.6	-116.0	-90.3	849.9	47.4	90.3	137.8
2054	353.0	20.0	-46.1	326.9	24.4	-114.3	-89.9	809.6	45.2	89.9	135.0
2055	326.9	20.0	-46.1	300.8	23.3	-117.5	-94.2	766.3	43.0	94.2	137.2
2056	300.8	20.0	-46.1	274.7	22.0	-120.7	-98.7	720.0	40.7	98.7	139.5
2057	274.7	20.0	-24.8	269.9	20.7	-66.8	-46.1	727.9	38.3	46.1	84.4
2058	269.9	20.0	-24.3	265.6	20.9	-67.4	-46.5	736.9	38.7	46.5	85.2

Source: AER - Draft Decision - APA VTS 2023-27 Access Arrangement - PTRM - June 2022 *and ACIL Allen stay-in-business additions*

Table A.2 Progressive change results

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2023	1,226.2	100.2	-48.0	1,278.5	35.2	-49.4	-14.1	1,315.2	63.6	14.1	77.7
2024	1,278.5	35.6	-43.6	1,270.4	36.8	-46.1	-8.2	1,344.5	68.6	8.2	76.9
2025	1,270.4	20.5	-45.0	1,246.0	36.5	-49.0	-10.6	1,356.5	70.6	10.6	81.2
2026	1,246.0	14.4	-45.6	1,214.8	35.8	-51.0	-12.5	1,360.6	71.7	12.5	84.2
2027	1,214.8	17.7	-46.5	1,186.1	34.9	-53.5	-15.1	1,366.6	72.3	15.1	87.4
2028	1,186.1	20.0	-46.9	1,159.2	34.1	-55.6	-16.9	1,374.0	72.6	16.9	89.6
2029	1,159.2	20.0	-50.6	1,128.5	33.3	-61.8	-22.9	1,376.2	73.0	22.9	95.9
2030	1,128.5	20.0	-53.7	1,094.9	32.4	-67.3	-28.3	1,373.5	73.1	28.3	101.5
2031	1,094.9	20.0	-54.0	1,060.8	31.5	-69.7	-30.7	1,369.0	73.0	30.7	103.7
2032	1,060.8	20.0	-54.6	1,026.2	30.5	-72.5	-33.5	1,362.4	72.8	33.5	106.2
2033	1,026.2	20.0	-55.3	990.9	29.5	-75.5	-36.5	1,353.4	72.4	36.5	108.9
2034	990.9	20.0	-54.5	956.4	28.5	-76.5	-37.7	1,343.9	71.9	37.7	109.7
2035	956.4	20.0	-53.6	922.8	27.5	-77.5	-39.0	1,333.9	71.4	39.0	110.5
2036	922.8	20.0	-53.7	889.1	26.5	-79.8	-41.7	1,322.1	70.9	41.7	112.6
2037	889.1	20.0	-53.4	855.7	25.6	-81.8	-44.1	1,309.0	70.3	44.1	114.4
2038	855.7	20.0	-53.1	822.5	24.6	-83.6	-46.5	1,294.5	69.6	46.5	116.1
2039	822.5	20.0	-55.3	787.3	23.6	-89.5	-53.2	1,274.6	68.8	53.2	122.0
2040	787.3	20.0	-58.9	748.3	22.6	-98.2	-62.7	1,246.3	67.7	62.7	130.4
2041	748.3	20.0	-61.2	707.1	21.5	-104.9	-70.3	1,211.5	66.2	70.3	136.5
2042	707.1	20.0	-59.4	667.6	20.3	-104.8	-70.7	1,176.8	64.4	70.7	135.1
2043	667.6	20.0	-57.7	629.9	19.2	-104.6	-71.0	1,142.3	62.6	71.0	133.6
2044	629.9	20.0	-55.9	594.1	18.1	-104.2	-71.1	1,108.2	60.7	71.1	131.9
2045	594.1	20.0	-54.0	560.1	17.1	-103.6	-71.1	1,074.9	58.9	71.1	130.0

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2046	560.1	20.0	-52.0	528.1	16.1	-102.6	-70.7	1,042.6	57.1	70.7	127.9
2047	528.1	20.0	-49.9	498.2	15.2	-101.4	-70.2	1,011.8	55.4	70.2	125.6
2048	498.2	20.0	-47.9	470.2	14.3	-100.2	-69.7	982.5	53.8	69.7	123.5
2049	470.2	20.0	-46.5	443.7	13.5	-100.0	-70.4	953.7	52.2	70.4	122.6
2050	443.7	20.0	-45.1	418.6	12.8	-99.7	-70.9	925.7	50.7	70.9	121.6
2051	418.6	20.0	-43.6	395.0	12.0	-99.1	-71.3	898.6	49.2	71.3	120.5
2052	395.0	20.0	-42.0	373.0	11.4	-98.3	-71.6	872.9	47.8	71.6	119.3
2053	373.0	20.0	-40.4	352.6	10.7	-97.2	-71.6	848.9	46.4	71.6	118.0
2054	352.6	20.0	-38.7	333.9	10.1	-95.8	-71.4	827.1	45.1	71.4	116.5
2055	333.9	20.0	-36.9	317.0	9.6	-94.1	-70.8	807.7	44.0	70.8	114.8
2056	317.0	20.0	-35.1	301.9	9.1	-92.0	-70.0	791.4	42.9	70.0	112.9
2057	301.9	20.0	-33.8	288.1	8.7	-91.2	-70.5	776.8	42.1	70.5	112.6
2058	288.1	20.0	-34.6	273.5	8.3	-95.9	-74.9	758.8	41.3	74.9	116.2

Source: AER - Draft Decision - APA VTS 2023-27 Access Arrangement - PTRM - June 2022 *and ACIL Allen stay-in-business additions and analysis*

Table A.3 Step change results

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2023	1,226.2	100.2	-74.5	1,252.0	35.2	-76.6	-41.4	1,288.0	63.6	41.4	105.0
2024	1,252.0	35.6	-66.3	1,221.3	36.0	-70.1	-32.3	1,292.5	67.2	32.3	99.5
2025	1,221.3	20.5	-66.0	1,175.8	35.1	-71.9	-33.4	1,280.1	67.9	33.4	101.3
2026	1,175.8	14.4	-62.2	1,128.0	33.8	-69.7	-31.2	1,263.4	67.6	31.2	98.8
2027	1,128.0	17.7	-60.1	1,085.6	32.4	-69.3	-30.8	1,250.8	67.2	30.8	98.0
2028	1,085.6	20.0	-59.0	1,046.5	31.2	-70.0	-31.3	1,240.5	66.5	31.3	97.8
2029	1,046.5	20.0	-63.2	1,003.4	30.1	-77.0	-38.2	1,223.5	65.9	38.2	104.1
2030	1,003.4	20.0	-66.1	957.2	28.8	-83.0	-44.0	1,200.8	65.0	44.0	109.0
2031	957.2	20.0	-62.1	915.1	27.5	-80.2	-41.1	1,181.0	63.8	41.1	104.9
2032	915.1	20.0	-58.7	876.4	26.3	-78.0	-38.9	1,163.5	62.8	38.9	101.7
2033	876.4	20.0	-59.6	836.8	25.2	-81.4	-42.4	1,142.8	61.8	42.4	104.3
2034	836.8	20.0	-60.0	796.7	24.1	-84.3	-45.5	1,119.5	60.7	45.5	106.3
2035	796.7	20.0	-60.6	756.2	22.9	-87.6	-49.0	1,093.0	59.5	49.0	108.5
2036	756.2	20.0	-59.4	716.7	21.7	-88.4	-50.2	1,065.8	58.1	50.2	108.3
2037	716.7	20.0	-58.6	678.1	20.6	-89.6	-52.0	1,037.4	56.7	52.0	108.6
2038	678.1	20.0	-58.0	640.1	19.5	-91.3	-54.2	1,007.4	55.1	54.2	109.3
2039	640.1	20.0	-58.4	601.7	18.4	-94.5	-58.2	974.2	53.5	58.2	111.7
2040	601.7	20.0	-60.5	561.2	17.3	-100.8	-65.3	934.7	51.8	65.3	117.1
2041	561.2	20.0	-60.4	520.8	16.1	-103.4	-68.8	892.4	49.7	68.8	118.5
2042	520.8	20.0	-58.8	482.0	15.0	-103.7	-69.7	849.6	47.4	69.7	117.1
2043	482.0	20.0	-57.3	444.7	13.9	-104.0	-70.4	806.3	45.2	70.4	115.5
2044	444.7	20.0	-55.8	408.9	12.8	-104.0	-70.9	762.8	42.9	70.9	113.8
2045	408.9	20.0	-54.1	374.8	11.8	-103.8	-71.3	719.3	40.5	71.3	111.8

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2046	374.8	20.0	-52.4	342.5	10.8	-103.4	-71.5	676.1	38.2	71.5	109.7
2047	342.5	20.0	-50.5	311.9	9.8	-102.6	-71.4	633.6	35.9	71.4	107.3
2048	311.9	20.0	-48.8	283.1	9.0	-102.1	-71.6	591.5	33.7	71.6	105.3
2049	283.1	20.0	-48.0	255.1	8.1	-103.2	-73.6	548.3	31.4	73.6	105.0
2050	255.1	20.0	-47.2	227.9	7.3	-104.3	-75.5	504.0	29.1	75.5	104.6
2051	227.9	20.0	-46.3	201.7	6.6	-105.2	-77.4	458.8	26.8	77.4	104.2
2052	201.7	20.0	-45.3	176.4	5.8	-106.0	-79.2	412.7	24.4	79.2	103.6
2053	176.4	20.0	-44.3	152.1	5.1	-106.7	-81.0	366.1	21.9	81.0	102.9
2054	152.1	20.0	-43.3	128.8	4.4	-107.1	-82.7	319.0	19.5	82.7	102.1
2055	128.8	20.0	-42.2	106.6	3.7	-107.5	-84.3	271.6	17.0	84.3	101.2
2056	106.6	20.0	-41.1	85.5	3.1	-107.7	-85.7	224.1	14.4	85.7	100.1
2057	85.5	20.0	-39.9	65.6	2.5	-107.7	-87.0	176.8	11.9	87.0	98.9
2058	65.6	20.0	-40.7	44.9	1.9	-112.9	-92.0	124.5	9.4	92.0	101.4

Source: AER - Draft Decision - APA VTS 2023-27 Access Arrangement - PTRM - June 2022 *and ACIL Allen stay-in-business additions and analysis*

Table A.4 Delayed step change results

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2023	1,226.2	100.2	-65.5	1,261.0	35.2	-67.4	-32.1	1,297.2	63.6	32.1	95.7
2024	1,261.0	35.6	-61.3	1,235.3	36.2	-64.8	-27.0	1,307.3	67.7	27.0	94.7
2025	1,235.3	20.5	-64.1	1,191.7	35.5	-69.8	-31.3	1,297.5	68.6	31.3	99.9
2026	1,191.7	14.4	-65.7	1,140.4	34.3	-73.6	-35.1	1,277.3	68.5	35.1	103.7
2027	1,140.4	17.7	-67.9	1,090.2	32.8	-78.2	-39.8	1,256.2	67.9	39.8	107.6
2028	1,090.2	20.0	-66.3	1,044.0	31.3	-78.6	-39.9	1,237.5	66.8	39.9	106.7
2029	1,044.0	20.0	-60.8	1,003.1	30.0	-74.2	-35.3	1,223.2	65.8	35.3	101.1
2030	1,003.1	20.0	-61.3	961.8	28.8	-76.9	-37.9	1,206.6	65.0	37.9	103.0
2031	961.8	20.0	-58.4	923.4	27.6	-75.3	-36.3	1,191.7	64.1	36.3	100.4
2032	923.4	20.0	-56.7	886.7	26.5	-75.3	-36.3	1,177.2	63.3	36.3	99.6
2033	886.7	20.0	-55.5	851.2	25.5	-75.8	-36.8	1,162.5	62.6	36.8	99.4
2034	851.2	20.0	-58.9	812.2	24.5	-82.8	-44.0	1,141.2	61.8	44.0	105.8
2035	812.2	20.0	-61.3	770.9	23.3	-88.7	-50.1	1,114.3	60.7	50.1	110.8
2036	770.9	20.0	-57.5	733.3	22.2	-85.6	-47.4	1,090.5	59.2	47.4	106.6
2037	733.3	20.0	-54.3	699.0	21.1	-83.1	-45.4	1,069.4	58.0	45.4	103.4
2038	699.0	20.0	-54.8	664.2	20.1	-86.2	-49.2	1,045.3	56.8	49.2	106.0
2039	664.2	20.0	-54.8	629.4	19.1	-88.8	-52.5	1,019.0	55.6	52.5	108.0
2040	629.4	20.0	-55.0	594.3	18.1	-91.7	-56.2	989.9	54.2	56.2	110.3
2041	594.3	20.0	-53.8	560.6	17.1	-92.1	-57.5	960.5	52.6	57.5	110.1
2042	560.6	20.0	-53.0	527.6	16.1	-93.4	-59.3	930.0	51.1	59.3	110.4
2043	527.6	20.0	-52.6	495.0	15.2	-95.3	-61.7	897.7	49.4	61.7	111.1
2044	495.0	20.0	-53.0	462.0	14.2	-98.9	-65.8	861.9	47.7	65.8	113.6
2045	462.0	20.0	-55.1	426.9	13.3	-105.7	-73.2	819.3	45.8	73.2	119.0

Year	Opening RAB ($2022)	Capital expenditure ($2022)	Real straight line Depreciation	Real Residual Capital Base (end period)	Inflation on Opening Capital Base	Nominal Straight-line Depreciation	Nominal Regulatory Depreciation	Nominal Residual Capital Base (end period)	Return on capital	Return of Capital (regulatory depreciation)	Revenue (total capital return)
2046	426.9	20.0	-55.1	391.8	12.3	-108.8	-76.9	773.5	43.5	76.9	120.4
2047	391.8	20.0	-53.7	358.1	11.3	-109.1	-77.9	727.3	41.1	77.9	119.0
2048	358.1	20.0	-52.3	325.8	10.3	-109.3	-78.8	680.7	38.7	78.8	117.4
2049	325.8	20.0	-50.8	295.0	9.4	-109.1	-79.5	634.1	36.2	79.5	115.6
2050	295.0	20.0	-49.2	265.8	8.5	-108.7	-80.0	587.9	33.7	80.0	113.7
2051	265.8	20.0	-47.5	238.4	7.6	-108.0	-80.2	542.2	31.2	80.2	111.5
2052	238.4	20.0	-45.7	212.6	6.9	-107.0	-80.3	497.6	28.8	80.3	109.1
2053	212.6	20.0	-44.1	188.5	6.1	-106.2	-80.5	453.8	26.4	80.5	107.0
2054	188.5	20.0	-43.2	165.3	5.4	-107.0	-82.6	409.4	24.1	82.6	106.7
2055	165.3	20.0	-42.3	143.0	4.8	-107.9	-84.6	364.2	21.8	84.6	106.4
2056	143.0	20.0	-41.4	121.5	4.1	-108.6	-86.5	318.6	19.4	86.5	105.9
2057	121.5	20.0	-40.5	101.1	3.5	-109.1	-88.4	272.6	16.9	88.4	105.3
2058	101.1	20.0	-40.0	81.0	2.9	-111.1	-90.1	224.8	14.5	90.1	104.6

Source: AER - Draft Decision - APA VTS 2023-27 Access Arrangement - PTRM - June 2022 *and ACIL Allen stay-in-business additions and analysis*

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