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A look at plans for Victorian Transmission System

APA Victorian Transmission System 2023-2027 access arrangement proposal overview

December 1, 2021

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The proposed 2023-2027 Victorian Transmission System (VTS) access arrangement proposal maintains safety, security and integrity of services provided by the VTS to customers and consumers. We have listened to and considered concerns raised by stakeholders on affordability and we have sought to minimise tariffs and bill impacts for customers.

The backdrop of this proposal has been characterised by an uncertain investment environment. The VTS stakeholder engagement involved discussing the complexity of conflicting policy for gas, and the uncertainty about demand and supply forecasts.

In this environment, investing under uncertainty we have sought to be fair, reasonable, and transparent with our stakeholders in developing plans for the VTS.

Stakeholder influence

Over a 14-month period, we held monthly VTS stakeholder engagement roundtables to go through issues impacting the planning for capital and operating expenditure for the 2023-2027 access arrangement period. The discussions involved attempting to reconcile demand and supply conditions, contrasting policy positions with the need to maintain safety and integrity of the ageing VTS. In this uncertain investment environment we have sought to do this with energy affordability in mind.

Key concerns emerged from stakeholder engagement and played a big role in helping to shape our thinking on key issues. These are summarised below.

Key concerns raised by stakeholders	Our response to stakeholder concerns
Affordability for all customers	• Proposed 2023 tariff limited to CPI increases from the current approved tariffs (combination of injection and withdrawal tariffs) • Smoothing tariffs as much as possible • Reducing costs as much as possible
Security of supply, but not at any price	• Avoid investing in long-lived assets that may only be used for a short time • Adopt an incremental approach to investing in new projects and replacement of existing assets • To reduce uncertainty, supply forecasts include only projects that have reached Final Investment Decision • Invest in what is needed and no more
Intergenerational equity	• Capping maximum asset lives to accelerated depreciation of assets • Adopt the principle of start early, start small, and monitor in recovering efficient investment • Minimise capital expenditure considering the proposal to shorten asset lives and accelerate depreciation
Investing under uncertainty requires flexibility	• Review of asset lives and depreciation profile if there is a change in circumstances • Hydrogen safety and integrity testing to assess possibility of repurposing VTS pipelines.

Stakeholder concerns and our consideration of them are discussed in this proposal overview document.

What is in the proposal

Highlights

APA VTS proposal for the 2023-2027 access arrangement proposal includes:

- Total capital expenditure program of $352 million ($2022). The proposed capital expenditure is $58.4 million (20%) higher than the total capital expenditure of $293.6 million for the current period
- Continued investment in the Western Outer Ring Main following a two-year delay to comply with Victorian Government planning requirements
- Investment in security related compression on the South West Pipeline to accommodate Lochard Energy's expansion of Iona Storage Facility capacity to 570TJ/day (SWP570). Lochard has reached Final Investment Decision for this expansion
- Security of Critical Infrastructure program to meet new Australian Government obligation likely to come into effect in 2022
- Investing in hydrogen safety and integrity testing ($37.9m) to assess feasibility of transporting hydrogen in VTS pipelines.

Investing under uncertainty

The current investment environment for gas infrastructure is uncertain. To help address uncertainty APA VTS is proposing measures to create a more supportive investment framework:

- Fixed Principle (Rule 99) in the access arrangement has been proposed so as the investment in SWP expansion is not subject to the Rule 85 capital redundancy provisions (this would apply on an ongoing basis)
- Capping the standard lives of assets to no more than 30 years to allow for accelerated depreciation of conforming capital expenditure. We propose that this applies to all conforming capital expenditure (new and existing). Accelerated depreciation was support by stakeholders.

The proposed regulatory safeguards will help to reduce investment risks in the current investment environment.

Proposed VTS tariffs

To make the proposed tariff outcomes easier to understand we present the tariffs as system-wide tariffs. System-wide tariffs are total annual the revenue for the year divided by the total volume for the year. The proposals outturn system-wide tariffs are shown here.

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Volumes (PJ)	220	229	222	225	206	206	203	201	197	198
Target revenue ($m nominal)	108	110	111	112	113	115	122	128	136	143
System wide average tariff $/GJ ($nominal)	0.49	0.48	0.50	0.50	0.55	0.56	0.60	0.64	0.69	0.72

In nominal terms, the system-wide tariff in 2022 is $0.55/GJ. This will increase by CPI in 2023 to $0.56/GJ. By 2027 the tariff is forecast to be $0.72/GJ.

The analysis using a composite tariff have been prepared to show in a simple way the average tariff impact. The actual VTS tariffs are more complex and the VTS tariff model is used to derive cost reflective tariffs. The tariff model is discussed in section 16.5.

Impact on customer bills

Residential customers and small business customers are supplied by gas by energy retailers. Victorian customer gas bills include cost of natural gas, VTS gas transmission costs, gas distribution costs (through their local distribution business) and retailer costs.

To assess the impact of the proposed tariffs changes for the VTS reference tariff, we have used published bill and consumption information as a benchmark[1]. We have looked at the impact of the change in average system-wide tariff from actual 2022 tariff to the proposed 2023 tariff has on the average annual VTS bill component.

The impact of the tariff on the average residential customer bill of the proposed 2023 tariff is $0.22 (22 cents). As shown in the table below that VTS component is just over 2% of average annual residential customer gas bill.

Residential customers	2022	2023
Average annual gas bill 2022 ($)	1350	1350
Average annual consumption GJ/year	54.4	54
Average cost of retail gas ($/GJ)	24.8	25
Bill impact		
Average VTS system-wide tariff ($/GJ)	0.5566	0.5607
Average annual VTS component of retail bill ($)	30.28	30.50
Change ($)		0.22
As a proportion of 2022 average gas bill	**2.24%**	**2.26%**

[1] Victorian Essential Services Commission Victorian Market Update: June 2021. Refer also to APA VTS 2023-2027 - Reset RIN - Workbook 5 - Indicative bill impact

The same approach applied to small business customers is shown below. The change from 2022 to 2023 is $2.05. We have added that $2.05 to the 2023 benchmark average annual gas bill. As shown in the table below, the VTS component is under 3% of average annual small business customer gas bill.

Small business customers	2022	2023
Average annual gas bill 2022 ($)	9426	9428
Average annual consumption GJ/year	500	500
Average cost of retail gas ($/GJ)	18.85	18.86
Bill impact		
Average VTS system-wide tariff ($/GJ)	0.5566	0.5607
Average annual VTS component of retail bill ($)	278.30	280.35
Change ($)		2.05
As a proportion of 2022 average gas bill	**2.95%**	**2.97%**

Benefits to customers & consumers

The 2023-2027 proposal will deliver benefits for customers and consumers:

- **Affordability and a secure and reliable supply.** Keeping tariffs as low as possible while maintaining safety, security, and reliability of the VTS
- **Orderly transition**. Starting to transition VTS tariffs early (to recoup efficient investment) to prevent future price shocks as energy sector transitions to lower carbon energy sources. We are concerned that any future price shocks would have a more concentrated impact on disadvantaged customers.
- **Safety and integrity.** Technical assessment of VTS pipelines, considering government policy decisions to include hydrogen in the national gas market framework, will help to provide information about the potential for transporting hydrogen on the VTS. This work is aligned to good industry practice to minimise risk to as low as reasonably practicable.
- **Security critical infrastructure**. Maintaining system security by safeguarding critical infrastructure against threats in line with obligations under Security of Critical Infrastructure framework. We have done this in an efficient and proportionate way
- **Security of supply** expansion of SWP will shore up resilience of the Victorian gas market considering the rapid decline forecast for Victorian gas production and uncertainty over investments in supply. The SWP570 will provide a form of insurance for Victorian customers and consumers
- **Prudent.** We have carefully considered the APA VTS regulatory obligations and good industry practice in developing the access arrangement proposal. The proposal will allow APA VTS to operate in a safe way and ensure integrity and reliability of services for gas customers and consumers. APA VTS capital and operating expenditure is underpinned by the principle of

minimising risk to as low are reasonably practicable in line with good industry practice. The proposed expenditure is of a nature that a prudent organisation would incur.

- **Efficient.** As part of APA Group, APA VTS benefits from economies of scale and scope relative to incurring cost on a stand-alone basis. APA is subject to market scrutiny and greater discipline to minimise costs. This provides assurance that costs are efficient and is a benefit to all customers. Procurement of work by APA VTS will be done in alignment with APA procurement policy which will deliver best value for customers. The proposal is consistent with the expenditure that a prudent organisation acting efficiently would incur.
- **Consistent with accepted and good industry practice.** APA VTS operations align with AS 2885 – The Standard for The Standard for Gas and Liquid Petroleum Pipelines. APA seeks to reduce risk to as low as reasonably practicable in a manner that balances cost and risk
- **To achieve the lowest sustainable cost of delivering pipeline services.** APA VTS proposal addresses the sustainable delivery of services by reducing risks to as low as reasonably practicable.

1. Overview

1.1. Purpose

APA VTS Australia (Operations) Pty Limited (APA VTS) has prepared a proposal to the Australian Energy Regulator (AER) for the 2023-2027 Access Arrangement for the Victorian Gas Transmission System (VTS). The proposal was lodged with the AER on 1 December 2021.

APA VTS is part of APA Group who proudly owns the VTS which plays a vital role providing gas to Victorian households and businesses. The gas transported on the VTS is used to power customers, communities, and the economy in Victoria.

APA's Purpose is to strengthen communities through responsible energy. This means doing the right thing, even in tough situations; creating value for all our stakeholders; taking a long-term view and being here for our future generations; investing in future technologies and new energy; and innovating for a sustainable future.

APA VTS committed to better engagement with stakeholders to help shape our 2023-27 access arrangement proposal for the VTS. The purpose of the engagement was to gain insights and input from the community of gas customers, consumers and stakeholders in Victoria impacted by the VTS. We wanted to have a better understanding of what is important to the VTS community. And we wanted to incorporate what's important to stakeholders in our proposed plans for operating and investing in the VTS over the 2023-2027 access arrangement period.

The VTS stakeholder engagement aligns with our Purpose. By consulting widely with parties impacted by the VTS, APA has, we believe, prepared an access arrangement for 2023 through 2027 that truly does strengthen communities through responsible energy.

The access arrangement has been prepared at a time of great complexity and conflicting policy. It was important to us to hear from stakeholders what was important to them.

1.2. Legal side of the proposal

The regulation of gas transmission pipelines is prescribed in the National Gas Law and Rules. The VTS is regulated under the National Gas Law and the National Gas Rules. The VTS is a fully regulated pipeline system, which means that prices (tariffs) for reference services, and the terms and conditions on which those services are provided, are subject to regulatory oversight by the Australian Energy Regulator (AER).

Oversight of a fully regulated pipeline is achieved through the AER approving an initial access arrangement for the pipeline, and subsequently approving periodic revisions to the access arrangement.

The access arrangement for a fully regulated pipeline sets out, amongst other things, the reference services that can be provided using the pipeline, the terms and conditions on which those services will be provided, and the reference tariffs for the services.

The form and content of the access arrangement, and the approval process which must be followed by the AER when approving access arrangement revisions, are specified in the National Gas Rules.

The provisions of the access arrangement must be consistent with the national gas objective. Access arrangement revisions, and the approval of revisions by the AER are, therefore, guided by that objective. The national gas objective is:

> *"The promotion of efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas".*

The current 2018-22 access arrangement requires APA to submit access arrangement revisions on 1 December 2021, and those revisions are expected to have effect for a period of five years from 1 January 2023.

Increasingly the AER is expecting energy businesses to engage with stakeholders. While engaging with stakeholders we met regularly with AER staff and took on board suggested ways to better engage. This was useful to help us meet AER expectations on stakeholder engagement.

1.3. Regulatory proposal suite of documents

We have now prepared and submitted the revised VTS access arrangement for the 2023-2027 regulatory period. The full suite of documents that form the proposal:

1. Proposal overview document (this one)
2. VTS 2023-2027 Access Arrangement
3. VTS 2023-2027 Access Arrangement Information
4. Regulatory Information Notice (RIN)
5. RIN Worksheets
6. Post-tax revenue model (PTRM)
7. Roll-forward model (RFM)
8. Register of documents.

We have prepared supporting information to support the proposed access arrangement revision.

1.4. Thank you to our stakeholders

We are pleased with the interest and level of feedback received for the VTS. From our perspective, VTS stakeholder engagement was an exciting, challenging, and important part of preparing the 2023-2027 access arrangement proposal.

On behalf of APA VTS, we thank and deeply appreciate stakeholders for their involvement and the open and honest discussions. We hope stakeholders found it informative and felt that they had influence in developing the plans.

2. Engaging with stakeholders

2.1. How we engaged with stakeholders

APA is committed to better engagement with stakeholders to improve the way we plan and invest in our regulated assets. We wanted VTS stakeholder engagement to involve people and businesses who rely on safe, reliable, and secure gas service in Victoria.

Recognising the range of views held by stakeholders (which in some cases are opposing), we did not set out to get agreement from stakeholders, but we wanted to understand everyone's point of view. And to the extent possible reconcile opinions and positions and incorporate them as much as possible into our proposal.

VTS stakeholder engagement group

APA VTS established the VTS Stakeholder Engagement Group to involve stakeholders in preparing the proposal. We mapped out key stakeholders and sought representation from consumer advocates, business advocates, customers (shippers), retailers, storage facilities, AEMO (Australian Energy Market Operator) and government. APA VTS considered that consumer and business advocates would represent the hard to reach residential and small business groups.

The full list of stakeholders is shown in 'Engaging with stakeholder on VTS plans' (filename VTS - Engaging with stakeholders on VTS plans – December 2021 - Public).

We expected stakeholder engagement group members to represent the views of their organisations. We valued the broad range of views and we sought to include, where appropriate, stakeholder feedback in our draft proposal.

The AER was invited as observers to ensure the regulator was satisfied with our engagement approach and that we were taking on board stakeholder views.

The engagement group has provided valuable insight, and feedback on matters important to customers, consumers and other stakeholders and has served to challenge and enhance our consideration of regulatory matters. Feedback from stakeholders was provided to the APA VTS Board.

Engagement Plan to consult on ways to engage

At our first Roundtable to set the scene, we published a draft engagement plan for consultation with the stakeholder engagement group. The draft engagement plan set out an indicative timeline for a series of roundtables and proposed topics to engage on.[2]

[2] Engagement Plan for consultation can be found here. VTS 2023-27 Access Arrangement Engagement Plan (apa.com.au) . Or refer to supporting material VTS – VTS Stakeholder Engagement Plan Draft 27.10.20 - December 2021 - Public

Importantly, the engagement plan set out engagement principles (shown below) that guided our approach.

Engagement principles

- **No surprises.** We want stakeholders and the regulator to feel that during the engagement process we revealed details of our thinking as we went along. At each roundtable we presented what we heard and our response to the issues raised in previous roundtables. At the last roundtable we let stakeholders know how feedback had been incorporated into the draft proposal.
- **Clear, accurate and timely communication.** We aimed to prepare information with sufficient time for stakeholders to consider and provide feedback. We held monthly roundtables and distributed material before the roundtables.
- **Easy to understand.** We aimed to prepare and provide accessible, non-technical information that could be read and understood by a wide audience. We made stakeholder engagement material and the timetable available on our website.
- **Transparent.** We wanted to be transparent about our thinking and plans. APA is ASX-listed and there are rules about what we can and cannot make public. The information we provided met the disclosure requirements**.**
- **Provides for influence.** We wanted to be open about what is and what is not open to stakeholder influence. We let stakeholders know whether we are simply providing you with information or seeking to consult and involve you in developing our plans. For example, our operating and capital expenditure plans are open to influence, and we will consult on these, however, rates of return align with regulatory instruments and were presented for information only.

Stakeholder roundtables

APA VTS held monthly roundtables with the VTS Stakeholder Engagement Group between October 2020 and November 2021. We also held a Capital Issues Workshop on 29 July 2021 to provide opportunity for deeper discussion on capital expenditure programs and projects. From the start of the engagement, stakeholders expressed interest in APA's technical work on hydrogen. We held a Hydrogen Information Session led by our technology team on 26 August 2021 to discuss APA's investigations into whether VTS pipelines can carry hydrogen.

At each roundtable we let stakeholders know where the session sat on the International Association for Public Participation spectrum (IAP2 spectrum). The IAP2 rating varied on the topics we discussed ranging from inform, involve, consult, and involve.

We considered our approach to engagement akin to 'thinking out aloud' with stakeholders in the room. We were presenting our thinking as we were developing our draft proposal.

Due to COVID-normal conditions we conducted the roundtables online via MS Teams.

VTS engagement webpage

An engagement page has been established on the APA website for the VTS 2023-2027 access arrangement revision. All the engagement documents for VTS were placed on this page during the engagement process.

The VTS engagement page can be found at victorian transmission system access arrangement | APA Group

Meetings

We had an open invitation for stakeholders to meet separately to discuss issues in more detail. Several stakeholders took the opportunity to do so. We held separate meetings with consumer advocates, LNG gas import terminal proponents, Lochard and AEMO.

'First Look' consultation document

Early on we received feedback from the engagement group suggesting that best practice engagement on regulatory determinations involved the businesses releasing a consultation draft of the proposal, before formal submission, to allow for stakeholder feedback. Taking on board this feedback, we agreed that a consultation draft proposal would be beneficial and provide valuable opportunity for feedback from the engagement group to test our draft positions.

We published the First Look consultation document on 8 October 2021. The First Look document played back what we heard from stakeholders; how we responded, set out key assumptions, and discussed inputs and forecasts incorporated to calculate the proposed revenue.

The First Look document included draft tariffs under a range of scenarios for the 2023-2027 access arrangement period.

We asked a series of questions and requested feedback on the draft positions in the First Look document. By late November we had received three written submissions from AEMO, Lochard Energy and a consumer advocate. We took on board feedback in the submissions. We provided further opportunity to stakeholders to provide verbal feedback during Roundtable 11 (22 November 2021).

Responses to the First Look consultation document helped us to gauge the level of support for proposed assumptions and tariff scenarios and other key assumptions.

Issues paper

We proposed to release short issue papers as key areas of interest emerged during the engagement. The purpose of the issues papers was to provide opportunity for deeper analysis and consideration of topics that were important to stakeholders.

We prepared the Capital Program Issues Paper which set out early thinking on key topics such as replacement capital expenditure, issues surrounding South West Pipeline, Western Outer Ring Main, and hydrogen.

During the Capital Program Issues Workshop, Lochard announced that it had reached Final Investment Decision to expand capacity of Iona storage facility to 570TJ.

Early on, we had proposed to prepare an issues paper on tariff structures. There was interest from stakeholders in better understanding tariff structures but to give this topic proper consideration, we decided the defer engagement on tariff structures.

Scope of engagement

We were up front that while we wanted stakeholder views on a wide range of topics, there were some things that are finalised under the regulatory rules that we operate under and there was little scope for influence (for example, rate of return is subject to the AER Rate of Return instrument).

We were clear that we valued the broad range of views. The broad range of stakeholders meant that we felt it was not appropriate to seek agreement on the submitted proposal from the engagement group.

2.2. How did we do?

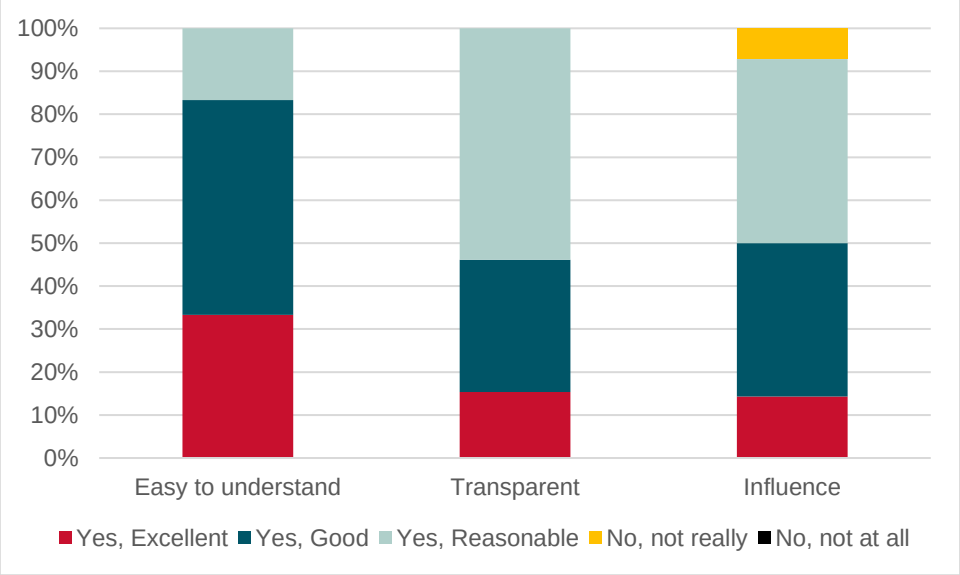
We are still learning from our stakeholders how best to engage with them and we know there is scope for improvement.

At Roundtable 12, the last roundtable (before submitting our proposal), we conducted an online poll and asked stakeholders:

1. Was the information (slides, presentations, papers) for the VTS stakeholder engagement easy to understand?
2. Was information (slides, presentations, papers) for the VTS stakeholder engagement transparent?
3. Do you feel that you had influence? Did we take on board your feedback?

Pleasingly, all the respondents to the poll consider that our stakeholder information was ‘easy to understand’, and ‘transparent’. And 93% considered that they had some level of influence.

Table 1 Feedback on APA VTS stakeholder engagement



We conducted a word cloud poll to ask:

4. In a few words, how would you describe the VTS stakeholder engagement?
5. Do you have suggestions for ways we could better engage?

Words to describe VTS stakeholder engagement were positive and encouraging including 'collaborative', 'issues rich', 'informative & helpful', as well as, 'work in progress'.

Suggestions for improvements included be guided by stakeholders, smaller groups, send out material sooner and continue the engagement through the access arrangement period.

More results are presented in the document 'Engaging with stakeholder on VTS plans' (filename VTS - Engaging with stakeholders on VTS plans – December 2021 - Public).

2.3. Key insights from stakeholders

Over the course of the engagement, there was a shift in the energy policy settings with the Victorian Government flagging the intention to transition from gas use to electrification to help achieve a target of Net Zero 2050. The Victorian Government's policy contrasts with the Federal Government's pursuing a post-Covid gas-led recovery. APA VTS stakeholder engagement presented on the conflicting policy environment and attempted to reconcile these contrasting policy positions in the access arrangement for the VTS access arrangement proposal.

The key themes that emerged from engagement with stakeholders and our response is summarised in the following table:

Key concerns raised by stakeholders	Our response to stakeholder concerns
Affordability for all customers	• Proposed 2023 tariff limited to CPI increases from the current approved tariffs (combination of injection and withdrawal tariffs) • Smoothing tariffs as much as possible • Reducing costs as much as possible
Security of supply, but not at any price	• Avoid investing in long-lived assets that may only be used for a short time • Adopt an incremental approach to investing in new projects and replacement of existing assets • To reduce uncertainty, supply forecasts include only projects that have reached Final Investment Decision • Invest in what is needed and no more
Intergenerational equity	• Capping maximum asset lives to accelerated depreciation of assets • Adopt the principle of start early, start small, and monitor • Minimise capital expenditure considering the proposal to shorten asset lives and accelerate depreciation
Investing under uncertainty requires flexibility	• Review of asset lives and depreciation profile if there is a change in circumstances • Hydrogen safety and integrity testing to assess possibility of repurposing VTS pipelines.

These themes underpin more detailed feedback on key topics which we discuss in the remaining sections of the proposal overview.

3. Demand and supply assumptions

3.1. Starting point

APA VTS relies heavily on AEMO, as operator of the Declared Wholesale Gas Market (DWGM) and VTS, in developing load and demand forecasts for the VTS access arrangement.

Following the release of AEMO's forecasting information, there were several announcements that, in our view, were likely to affect the forecasts. These included APA's planned expansion of the East Coast Grid, Origin's contemporaneous supply contract with APLNG, and Esso and Qenos curtailing consumption in Altona.

APA VTS wanted to better understand proposed supply projects to bring gas into Victoria from the west of Melbourne and questioned AEMO's flat longer term demand forecast. (That is flat, rather than what we would have expected to be falling - considering Victoria's Net Zero 2050 ambition).

A more detailed understanding was required to help us better understand the quickly changing demand and supply dynamics.

3.2. Stakeholder engagement

Roundtables

APA discussed engaging external experts to explore key issues affecting supply and demand in Victoria considering the changes in the market after release of the AEMO's 2021 Gas Statement of Opportunities (GSOO).

Stakeholders asked to be involved in reviewing the terms of reference for the study. APA VTS consulted with the stakeholder engagement group on the terms of reference for the study. APA engaged Oakley Greenwood to investigate factors likely to affect the demand and supply in the Victorian gas market and the potential implications for the VTS. Oakley Greenwood provided regular updates and sought feedback during stakeholder roundtables.

On the demand-side, stakeholders sought to understand the potential impacts of a net zero policy on demand forecasts. It was noted that the proposed electrification of Victorian residential heating loads could have a significant impact on future gas demand. Many customers can simply switch from gas to air conditioning and the Victorian Government is providing incentives to switch. The potential for demand-side management was raised.

Oakley Greenwood's final report took on board comments from stakeholders and looked further into to shift to electrification of heating. Oakley Greenwood noted that there was a case for policymakers to consider introducing a market mechanism that would allow demand-side participation in the peak of winter to assist in managing the risks of small excess peak demand excursions. Further, it was noted that the AEMO had not envisage the closure of Yallourn Power Station and that the implications for gas powered generation is difficult to assess.[3]

[3] In the 2021 ESOO, AEMO said that since the 2020 ESOO, the planned retirement of Yallourn Power Station (Victoria) was brought forward. AEMO lists possible actions to improve reliability in Victoria include continued generation and storage investment and development of additional DSP resources. This includes the 350 MW, four-hour, large-scale Jeeralang Battery being developed by 2026.

On the supply-side, there was a view from some stakeholders that storage facilities and proposed LNG import terminals could be potential sources of supply to alleviate gas shortages forecast by AEMO.

We clarified with stakeholders that the scope was to use publicly available information and would place more weight on projects that had reached Final Investment Decision (FID).

First look consultation document

In response to APA VTS First Look consultation document, and in roundtable discussions, demand and supply forecasting was the most contentious issue raised by stakeholders.

Some stakeholders considered that APA VTS should adopt AEMO's assumption that included Port Kembla LNG Import Terminal (PKGT). Others recognised the lack of a clear definition of 'committed' used by AEMO and no public FID announcement may imply that PKGT was not a done deal.

Lochard consortium's submission to the APA VTS First Look consultation document noted the timing off the forecast drop-off in Victorian production (Gippsland annual production forecast decline by 52% by 2025), meant that the proposed increase of 102TJ/day after the delivery of the WORM provided by the proposed APA SWP expansion project may not meet the expected shortfall in supply if approved within the 2023-2027 period.

Further, Lochard consortium contended that it has not been established how the proposed PKGT LNG facility would fulfil a Victoria gas peak supply role. As a gas storage facility, an LNG terminal stores smaller volumes than that of Lochard's Iona facility (estimated 3PJ vs 23.5PJ) and is a greater distance from the Victorian market and hence may have a less timely responsiveness. Lochard consortium raised that it is not clear how refilling the PKGT LNG terminal could be reliably coordinated amongst different users who may need different frequencies. Lochard consortium provided modelling work on peak day demand that contended that there could be a security of supply issue for the supply of peak demand energy.

AEMO noted that the 2021 GSOO states that if the PKGT is delayed, or gas cargoes are delayed once operational, greater reliance would be placed on storages, and gas shortfalls of up to 100 TJ per day in the southern states may eventuate in winter 2023 under extreme conditions.

Consumer groups were of the view that APA VTS should adopt AEMO forecasts which included the PKGT providing gas into Victoria. Consumer groups considered that AEMO forecasts were likely to be the most reliable in the market. The underlying concern by consumer groups was that excluding PKGT increased the likelihood of the need for augmentation of the South West Pipeline. And in the view of consumer groups, there was potential for customers to bear the risk of potential stranding of South West Pipeline assets, if demand for gas fell.

As discussed with stakeholders at Roundtable 12, APA VTS is prepared to review this position at the revised proposal stage if circumstances change.

3.3. APA VTS consideration

The demand and supply forecasts underpinning this access arrangement is the most uncertain aspects of the proposal package. The decision to invest in security of supply expansion of the SWP hinges on them.

Expected declines in Longford gas production are well documented. AEMO's 2021 GSOO forecasts gas shortfalls in Victoria from winter 2026 (providing the proposed Port Kembla LNG import terminal is built on time).

The GSOO, and the Federal Government's National Gas Infrastructure Plan (NGIP) both point to the need to expand the SWP to bring more gas into Victoria (including additional Otway Basin production) and avoid shortfalls.

The Victorian Government's legislated Net Zero 2050 initiatives and Infrastructure Victoria's interim report,[4] may impact the VTS in the following ways:

- Reduce the time horizon over which prudently invested capital can be returned to investors
- Reduce the gas load over which that capital can be returned without significant tariff impacts
- Reduce the peak day demand requirements, impacting the need to expand the South West Pipeline, and
- Expose any investment made in expanding the South West Pipeline to stranding.

APA VTS has carefully considered these complex factors.

We maintain the position to include only those projects announced to the market reaching FID. This means that we, at this stage, have not included PKGT in our supply forecasts. As discussed with stakeholders at R12, APA VTS is prepared to update this position at the revised proposal if circumstances change.

APA has balanced the need to maintain reliable and secure supply to Victorian against the impact on tariffs. As discussed above, the scenario we had proposed to stakeholders at Roundtable 11 (Scenario 1) included investment in the SWP570.

Further discussion about APA VTS's demand and supply forecasts can be found in the document VTS – RIN B11 Load and demand – Dec 2021 – Public.

3.4. APA VTS proposal

Forecast supply and demand in the southeast Australia gas market, and for Victoria in particular, is drawn from the AEMO March 2021 Gas Statement of Opportunities (GSOO) and accompanying Gas Statement of Opportunities report figures and data and the AEMO forecasting data portal, which presents the detailed figures behind the GSOO, and the 2021 AEMO Victorian Gas Planning Report (VGPR).

The combined effect is an assumption that demand is forecast to fall over the forecast period, from 206 PJ/year in 2023 to 198 PJ/year in 2027. For the purposes of the 2023-27 VTS access arrangement, APA has taken the following position:

- PKGT has not reached FID and we cannot assume that (if it does reach FID) that it will be completed in sufficient time for APA VTS to rely on it to meet security of supply needs

[4] Infrastructure Victoria, *Towards 2050: Gas infrastructure in a zero emissions economy* , consultation on which closed on Monday 16 August 2021. The executive summary comments: "Under all scenarios that we considered, the opportunity to repurpose existing natural gas infrastructure over the long term (beyond 2040) is limited."

- Expansion of the APA East Coast Grid is assumed to be able to supply more gas consumption in Sydney, some of which would otherwise have been supplied from Longford via northbound flows on the Eastern Gas Pipeline. The gas that would have flowed north to Sydney, particularly on the peak day, will be available for redirection to Melbourne needs
- Even with 100 TJ/day being redirected from Sydney to Melbourne, the supply and demand balance in the outer years of the access arrangement period appears tight
- Expansion of the SWP to 570 TJ/day to allow all committed Iona injection capacity to access the market will be sufficient to meet Victoria's peak day demand needs.

This underpins the forecast need for the SWP expansion and forms the foundation of the tariff calculation. APA VTS has forecast export volumes to remain in line with averages over the 2018-22 access arrangement period.

The impact of this is that we are proposing to invest in SWP to accommodate Lochard's FID announcement to expand Iona storage facility to capacity of 570TJ per day.

Further information on the proposal to invest in SWP570 is presented in section 7.

3.5. Rule 80 application for long term supply security

The demand and supply forecasts discussed above focus on the ability of the VTS to meet peak day demand requirements. However there remains a need, considering ongoing declines in Longford production, to get enough gas into Victoria to meet not only peak day needs but also annual supply requirements.

Iona gas storage does not currently have enough capacity to serve as seasonal storage.[5] Its limited storage volumes restrict its role to meeting peak day, rather than seasonal, requirements. There remains a need to source additional gas to meet Victoria's annual needs.

There are projects mooted to bring more gas into Victoria but none of these projects have reached Final Investment Decision (FID).

The mooted projects fall into two broad categories:

- Those that require investment outside the VTS, and
- Those that require investment both outside and within the VTS.

In the first category:

- The completion of the PKGT would require bi-directionality and compression on the Eastern Gas Pipeline. Once that gas reaches Longford, the Longford-Melbourne Pipeline currently has sufficient capacity, considering forecast declines in Longford production. Therefore, the VTS would not require investment to accommodate this additional gas.
- Additional expansion of the APA East Coast Grid to allow further injections at Culcairn would require additional upstream compression to deliver more gas to Culcairn. However, once at

[5] The Iona Gas Storage facility holds approximately 16 PJ of useable gas, compared to an annual VTS load in the order of 200 PJ/year, weighted more heavily to winter than summer. With the completion of the WORM and bi-directionality of the proposed SWP compressors, there may be scope for Iona storage to cycle more frequently over the winter season.

Culcairn, the Victoria-NSW Interconnect currently has sufficient southbound capacity to accept significant quantities of gas without further VTS investment.
- Further expansion of the APA East Coast Grid to deliver more gas to Wilton to then be shipped southbound on the Eastern Gas Pipeline would also require investment outside Victoria, but as with the PKGT, the Longford-Melbourne Pipeline currently has sufficient capacity to accommodate these additional flows without further investment in Victoria.

In the second category, there are three projects proposed to bring more gas into Victoria, which may require some investment in the VTS:

- An LNG import terminal at Geelong, proposed by VIVA Energy. This could provide seasonal injections in the order of 600 TJ/day over the course of the southern winter. Depending on the need to be able to maintain deliverability from Iona, this could require augmentation of the SWP, the Brooklyn-Lara Pipeline and the Brooklyn City Gate.
- An LNG import terminal in deep water off Avalon, proposed by Vopak. This could provide seasonal injections in the order of 600 TJ/day over the course of the southern winter. Depending on the need to be able to maintain deliverability from Iona, this could require augmentation of the SWP, the Brooklyn-Lara Pipeline and the Brooklyn City Gate.
- Further augmentations to the Iona Gas Storage facility proposed by Lochard Energy, which would increase both the amount of gas that could be stored, and also the daily deliverability rate. This project may require additional looping of the SWP, and also upgrades to the Brooklyn City Gate.

While these three projects are the subject of public proposals, none have reached FID, and are not expected to do so before the VTS access arrangement proposal is required to be lodged with the AER on 1 December 2021.

The VTS is unique in that, under the market carriage model, there is no scope to enter bilateral arrangements with shippers to support investment in pipeline capacity. All such investment must be done through the access arrangement process. This places these last three projects, all potentially requiring investment in the VTS, at a competitive disadvantage relative to those projects only requiring investment outside the VTS, which investment can be undertaken through commercial arrangements.

To maintain a level playing field, APA proposes to lodge an application under Rule 80 of the National Gas Rules, seeking the pre-approval of the AER to consider these projects as conforming capital expenditure if they are built.

For more detail, see the document: APA – Application under Rule 80 of the NGR – December 2021 – Public.

4. APA cost allocation method for regulated assets

4.1. Stakeholder engagement

APA operates assets across Australia and provides services that are heavily regulated by economic regulators and services that are more lightly regulated and subject to market condition. Stakeholders sought assurance that APA' costs were efficient and that costs were being allocated between regulated and unregulated businesses on a fair and reasonable basis.

4.2. APA VTS response

Being part of a larger energy infrastructure portfolio provides VTS customers with the benefit of the economies of scope and scale associated with the larger asset portfolio. Moreover, because most of APA's assets are operated under a contract carriage model, cost increases are not readily recovered from customers. This places a strong management focus on the level of costs incurred.

APA's approach to cost allocation is set out the Cost Allocation Method (CAM) document prepared for APA regulatory reporting purposes. The CAM has been developed with reference to the AER's guideline for electricity transmission businesses as set out in "Electricity transmission network service providers, cost allocation guidelines" published in June 2008. The AER's 2008 Cost Allocation Guideline has been used because there are no cost allocation methodology guidelines available for gas transmission businesses.

The purpose of the CAM is to set out the policy for attributing and allocating cost to services in accordance with the National Gas Rules, and for reporting operating and capital costs information to the AER. The CAM provides guidance for APA management and staff in relation to cost allocation principles, policies, and ongoing obligations as they relate to the operations and delivery of the services.

APA's most recent CAM was submitted to the AER in April 2021 as part of the information submitted for the VTS Annual Regulatory Information Notice. The CAM is approved at the director and senior management level.

APA's cost allocation methodology is summarised in the following box.

The key cost allocation principles APA has adopted are as follows:

- costs are not allocated more than once
- costs cannot be treated as a directly attributed cost and other directly attributable cost
- costs are allocated on a causal basis, in instances where direct attribution is not possible.

Where costs are not directly attributable, they are allocated among the APA businesses on a revenue basis:

$$\text{Service provider shared support costs} = \text{Total APA shared support costs} \times \frac{\text{Service provider revenue}}{\text{Total APA revenue}}$$

APA VTS's current CAM has been applied consistently since the second half of the calendar year 2015 and is in line with the CAM applied to APA's other regulated businesses. The method is based on revenue as the allocator. The level of revenue that a regulated business contributes to the APA Group determines cost allocation.

4.3. APA VTS proposal

The CAM is a fair, reasonable and transparent approach for allocating shared costs. The CAM is submitted and reviewed by the AER. APA Group revenue is provided in the Annual Report published in line with requirements under the Corporations Act.

The CAM has been used to forecast capital expenditure requirements for:

- Information Technology
- Right of use leases for motor vehicles and building and property expenditure not directly attributable to VTS
- Security of Critical Infrastructure program (the exception is for physical security where a site-specific cost model has been developed and applied).

Further information on the forecasts can be found in following sections on capital expenditure and operating expenditure.

5. Capital expenditure program

5.1. Starting point

Capital expenditure can only be added to the capital base and recovered through reference tariffs, if it is expenditure that would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

During engagement with stakeholders, we presented our best available information on capital expenditure as it became available. Capital programs and forecasts changed as investment options were refined and information was updated. We were transparent with stakeholders about the reasons and where information was less certain.

There were changes during stakeholder engagement for forecasts for replacement expenditure, security of supply-related Western Outer Ring Main (WORM) and options for security of supply-related investment in South West Pipeline. Further, following the Energy Ministers' announcement to expand the definitions of gas for the National Gas Law and National Gas Rules[6] we presented information on the proposed safety and integrity assessment of VTS pipelines to carry hydrogen.

5.2. Stakeholder engagement

Stakeholders understood the complexity of the policy environment and the uncertainty about demand and supply forecasts. Stakeholders wanted security of supply but wanted us to invest in what was needed and no more, and to consider alternatives to investment. There was concern that investment in long-lived assets would only be needed for a short time and customers could potentially be left having to pay for stranded assets.

Stakeholders emphasised the need for APA VTS to explain the reasons for the upward revision in the replacement and WORM forecasts; and the need to demonstrate that the proposed forecast capital expenditure is fair, reasonable, and proportionate.

Further, stakeholders requested that we explain how costs are allocated between APA's regulated and unregulated assets to provide assurance that costs were allocated appropriately. We discuss APA Group's cost allocation method in section 4.

Our consideration and response to these concerns is discussed in the following sections on forecasts by asset category.

5.3. VTS APA proposal

APA VTS is proposing a capital expenditure program of $352 million ($2022) in the 2023-2027 access arrangement period. The proposed capital expenditure is $58.4 million (20%) higher than the total capital expenditure of $293.6 million for the current period.

The 10-year trend in capital expenditure from the current period (2018 to 2022) to the next period (2023 to 2027) is shown in **Figure 1** and **Table 2** below.

Proposed capital expenditure is increasing in the next period is driven by an increase in forecasts for replacement expenditure, inclusion of security related expansion of South West Pipeline, and

[6] Refer to Extending the national gas regulatory framework to hydrogen blends and renewable gases | energy.gov.au

addition of a proposed hydrogen safety and integrity assessment, and new Security of Critical Infrastructure program to meet new regulatory obligations.

The following chart and table show the 10-year trend in capital expenditure for the current period and the draft proposed capital expenditure.

Figure 1 Capital expenditure actual, estimated and forecast ($millions, $2022)

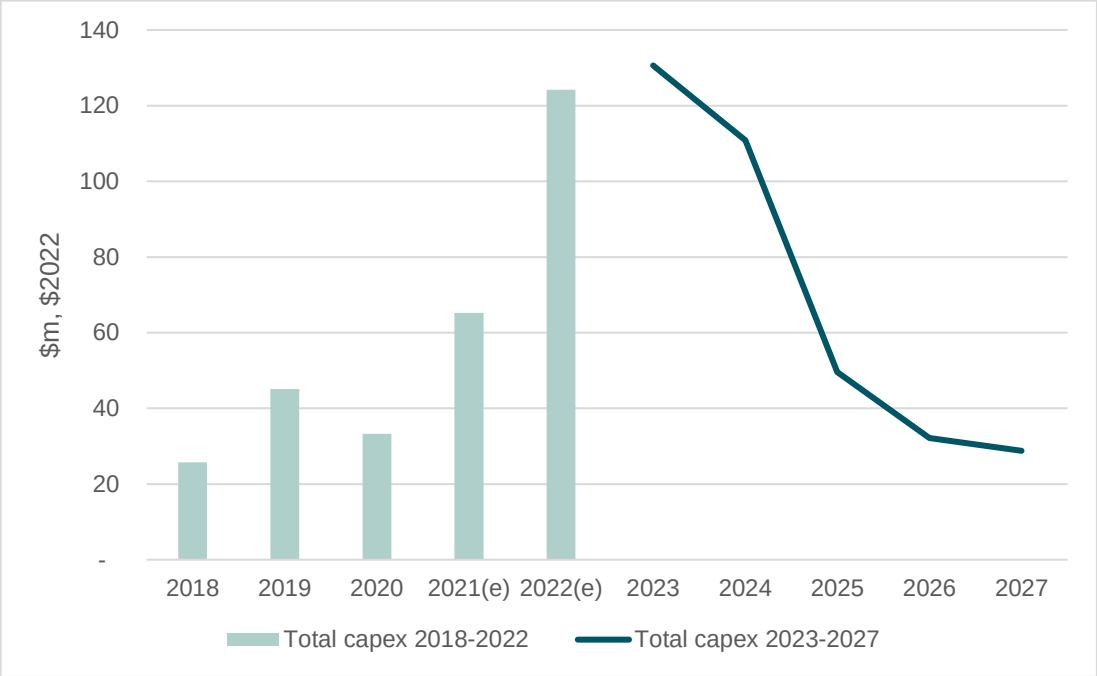


Table 2 Capital expenditure actual, estimated and forecast ($millions, $2022)

Asset category	Unit	2018	2019	2020	2021(e)	2022(e)	2023	2024	2025	2026	2027
Replacement	$m, $2022	4.6	12.1	11.7	29.3	19.7	26.9	35.9	26.0	18.1	16.1
Expansion	$m, $2022	13.3	17.7	11.0	30.6	97.3	80.7	52.4	6.8	-	-
Other (SoCI. Hydrogen safety)	$m, $2022	-	-	-	-	3.7	11.4	11.6	11.5	10.7	8.0
Non-network	$m, $2022	7.8	15.3	10.5	5.3	3.5	3.1	3.9	2.0	1.3	3.0
Capitalised overhead	$m, $2022	-	-	-	-	-	8.4	7.1	3.2	2.1	1.7
Total capital expenditure	$m, $2022	**25.7**	**45.1**	**33.3**	**65.2**	**124.2**	**130.6**	**110.9**	**49.6**	**32.2**	**28.8**

In the current period there is an uptick in 2021 and 2022 capital expenditure due to ramp up in expenditure security related expansion before flattening in the latter years. The lumpy nature of expansion projects is the reason for the peakiness of the capital expenditure.

Further information about the security related expansion is provided in the sections below on Western Outer Ring Main (WORM) and SWP570.

Other capital expenditure includes the forecast cost of the proposed hydrogen safety and integrity assessment ($37.9m) and Security of Critical Infrastructure program.

Note that we started to split out capitalised overheads (from other capital expenditure) for the next access arrangement period. Up until 2023, APA had been allocating overheads to other asset categories.

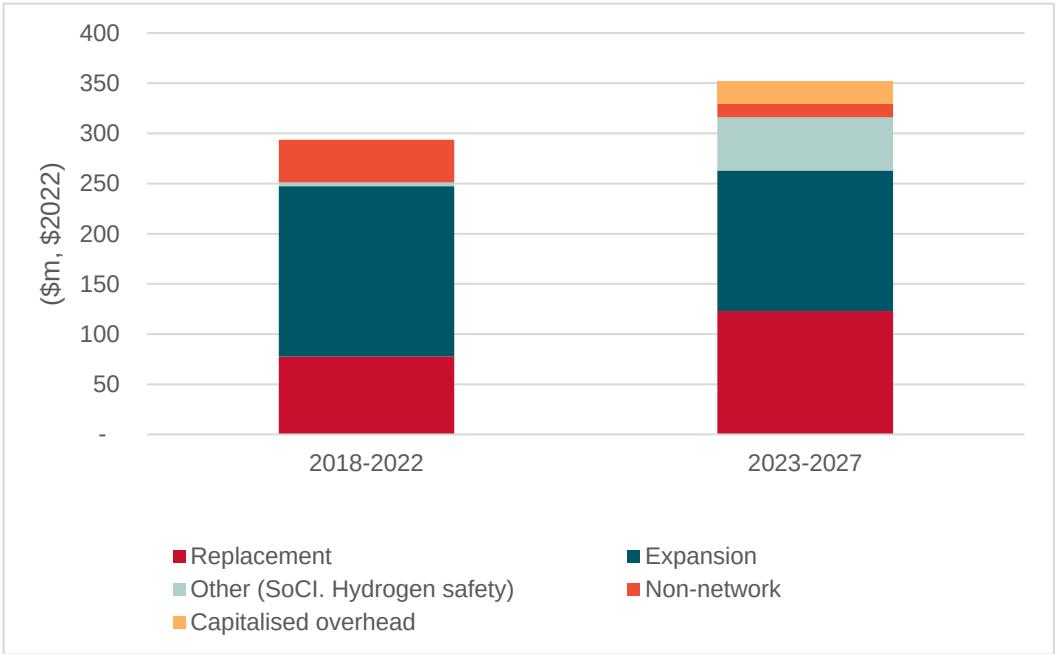
A comparison of the total capital expenditure in the periods 2018-2022 and 2023-2027 is shown in **Table 3** and **Figure 2** below.

Table 3 Capital expenditure 2018-2022 and 2023-2027 ($millions, $2022)

Capital expenditure	Unit	2018-2022	2023-2027	Change	% change
Replacement	$m, $2022	77.5	122.9	45.4	59%
Expansion	$m, $2022	169.9	140.0	-30.0	-18%
Other (SoCI. Hydrogen safety)	$m, $2022	3.7	53.2	49.5	-
Non-network	$m, $2022	42.4	13.3	-29.1	-69%
Capitalised overhead	$m, $2022	-	22.5	22.5	nan
Total capital expenditure	$m, $2022	**293.6**	**352.0**	**58.4**	**20%**

As shown, there is a $45.4 million (59%) increase in replacement capital expenditure in the 2023-2027 period compared to the current period. The reasons for this are discussed in section 0.

Figure 2 Capital expenditure 2018-2022 and 2023-2027 ($millions, $2022)



Non-network expenditure is lower in 2023-227. Reasons for this include, in 2018-2022 there was $10 million of expenditure on Dandenong Office & Storage that increased costs in that period. In addition, forecast migration of key Information Technology business solutions to cloud-based computing solution is seeing costs that were capital expenditure being treated as operating expenditure.

In the following sections we discuss key capital programs and capital expenditure forecasts.

6. Replacement capital expenditure

6.1. Starting point

Replacement program and projects are driven by the need to maintain and improve the safety, security, reliability and integrity of services. APA VTS replacement programs and projects are underpinned by legislative obligations and Australian Standards. The assessment of replacement expenditure falls within Rule 79 whereby the capital expenditure is necessary:

- to maintain and improve the safety of services; or
- to maintain the integrity of services; or
- to comply with a regulatory obligation or requirement; or
- maintain capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from an expansion of pipeline capacity).

Our proposed replacement capital expenditure program has increased in response to increased risks of ageing assets combined with urban encroachment which need to be addressed. The proposed replacement capital expenditure program seeks to reduce risk to as low as reasonably practicable in line with safety obligations and good industry practice.

6.2. Stakeholder engagement

We presented APA's asset management framework and lifecycle management plan for the VTS as well as preliminary replacement (stay-in-business) plans and forecasts early in the engagement (Roundtable 5). The feedback we received on preliminary forecasts questioned the front-loaded timing of the stay-in-business plans and forecasts. Since the preliminary plans we reassessed the timing of the expenditure to smooth it out over the access arrangement period.

Stakeholders sought to understand the drivers for the increase in the replacement expenditure forecasts and substantiation and justification for them. There was also a concern that projects may have been approved in the previous period but not carried out.

In Roundtable 9, we presented updated replacement forecasts which were a substantial increase over the preliminary forecasts. Stakeholders wanted to understand the reasons for the increase.

In Roundtable 11 we were asked whether we would be reviewing our capital expenditure forecasts given concerns outlined by the AER about reluctance to approve large increases in capital expenditure when businesses were seeking to accelerate depreciation.

6.3. APA VTS consideration

The replacement program and projects are integral to maintaining and improving safety, maintaining security and integrity of transmission services. Most are underpinned by regulatory obligations and standards. APA VTS manages the VTS to ensure that we meet our obligations under the National Gas Rules, Victorian safety obligations, and the Service Envelope Agreement with AEMO. APA's asset management framework provides for systematic and coordinated activities and practices through which we optimally and sustainably manage our assets, their associated performance, revenues, risks, and expenditures over the asset life cycles. We focus on top-down strategic input, bottom-up business planning.

As the VTS ages, there is an increased focus on asset integrity management programs that provide for APA to review the condition of each pipeline. Greater urbanisation, residential development, and

urban sprawl (especially around Melbourne and surrounds) has resulted in encroachment near VTS pipelines and equipment. Location of VTS pipelines and equipment have in the past been a lot more isolated.

Encroachment has resulted in properties located closer to VTS pipelines and equipment. Encroachment has increased the risk and consequence of a safety incident and in response APA has enhanced focus on measures to reduce these risks and consequences.

APA VTS has submitted 31 replacement / stay-in-business (SIB) business cases. Many of the replacement and stay-in-business programs and projects are ongoing and span several regulatory access periods.

Under APA's asset management approach, risks and priorities are assessed on an ongoing basis. In some cases, programs and projects that formed the AER approved forecasts may not always be the ones that get assessed as a priority as part of the asset management planning, or there may be changes in their scope and cost.

At least six projects from the current period were deferred to allow for other priority projects (for example, to fund more work on unpiggables) and have been carried over into the 2023-2027 proposal.

In response to concerns raised by stakeholders, we carefully reviewed the replacement capital expenditure program. We reduced the scope of the encroachment program and reduced the size of the capital budget. Overall, we have revised down the replacement forecast from $140.4 million (adjusted to take out SoCI (Security of Critical Infrastructure) related physical security) to $122.9m. This is $17.4m (12%) lower because of stakeholder feedback.

6.4. APA VTS proposal

The proposed replacement capital expenditure program of $122.9 million is $45.4million (59%) more than expenditure in the current period. The increase is due to a greater focus on asset integrity. The Integrity Management program and the Unpiggables program together make up $54.4 million (44%) of the proposed 2023-2027 replacement program (as shown in **Table 4**).

Asset integrity is more important as the VTS ages because of more urban encroachment close to VTS assets. Further, increased use by APA VTS of best practice asset integrity in line inspections (rather than direct assessment methods) is finding more condition-based repairs that need to be undertaken.

Table 4 Major replacement programs and projects ($millions)

Replacement (SIB) program	Unit	2018-2022	2023	2024	2025	2026	2027	Total
Total replacement	$m, $2022	**77.5**	26.9	35.9	26.0	18.1	16.1	**122.9**
Key programs								
BC258 Integrity management (in line inspections)	$m, $2022	40.4	7.0	6.5	6.9	5.2	2.1	**27.6**
BC259 Unpiggables	$m, $2022	16.9	9.7	14.1	3.0	0.0	0.0	**26.8**
BC204 Upgrade Brooklyn compressor	$m, $2022	2.8	2.5	2.5	2.5	2.8	0	**10.3**

As shown in the above table, the program for pipeline integrity is the highest cost project. The aim of this project is to ensure that VTS buried gas pipelines remain fit for safe and reliable service.

The 'Unpiggable' pipelines program is the second largest program in the total replacement program. The objective of the unpiggable pipelines program is to enable the inline inspection of historically unpiggable pipelines to conform to APA integrity policy and ensure safe reliable operation of the VTS unpiggable pipelines.

The proposed replacement expenditure is necessary to ensure a reliable service is provided to Victorian gas customers and consumers.

Further information is available in the VTS Asset Performance & Lifecycle Plan (filename VTS - Asset Performance & Lifecycle Plan - AA CY23-CY27 - December 2021 - Public) and related businesses cases.

A presentation to stakeholders in Unpiggables program can be found file VTS - VTS Roundtable 7 Unpiggables -16.06.21 - December 2021 - Public.

7. Expansion of the South West Pipeline

7.1. Starting point

AEMO's Gas Statement of Opportunities (GSOO) and Victorian Gas Planning Report (VGPR) have predicted a shortfall in gas supplies in the Victorian Transmission System (VTS) to meet winter demands as early as 2023. This shortfall is driven by the declining gas supplies from Longford.

APA VTS is facing pressure from governments to invest in expansion of capacity on the South West Pipeline (SWP) to provide greater security of supply in Victoria.

7.2. Stakeholder engagement

We heard support from stakeholders for investment in security of supply in the VTS, especially for businesses who relied on gas. Lochard Energy informed the group at the Capital Issues Working Group in July 2021 that it had reached Final Investment Decision (FID) to enable Iona to reach 570 TJ/d of SWP injection capacity from 2023 and that this capacity and the planned increase in gas production from western Victoria will require further SWP capacity expansion beyond 468 TJ/d (post WORM).

Lochard said that further expansion of SWP capacity is the key enabler for the incremental swing capacity to reach the demand centres when the market needs it the most. Lochard stated that the requirement of further expansion of SWP must be considered within the 2023-2027 access arrangement process.

In response to the First Look consultation document, Lochard consortium supported investment in the SWP570 to improve security and resilience of the VTS. The consortium confirmed that there was demand for the expanded capacity.

As an alternative to investing in SWP, proponents for LNG import terminals suggested that LNG import terminals would not require any investment on SWP suggesting that this may be a preferred course of action. It was noted that AEMO modelling showed that the Viva proposal would increase capacity in VTS by 300TJ per day, without the need for only minor VTS investment associated with upgrades to the Brooklyn and Lara City Gates.

Consumer advocates raised concerns about the prospect of investing expansion of the SWP under such uncertain conditions. The concern was raised whether the proposal to invest in SWP was using long-lived assets to solve a short-term problem and whether it would be needed in five years? There was concern that future customers would be left to pay for an asset that may not be required in the longer term and may end up being stranded.

Other stakeholders were concerned about supply shortfalls and supported investment to meet security of supply concerns.

7.3. APA VTS consideration

As discussed in section 3, the current supply and demand forecast indicates a need to expand the SWP to meet forecast peak demands. This expansion will potentially be required for winter 2024.

There are several options to provide the additional required capacity of the SWP between Iona and Brooklyn, featuring varying combinations of compression and looping.

From the options investigated, we have landed on an option to invest in two compressors, one each at Stonehaven (where we own buffer zone land) and one at Pirron (where we would need to acquire buffer zone land). Upgrades to the Brooklyn City Gate will also be required.

7.4. APA VTS proposal

APA is proposing to expand the South West Pipeline (SWP) to allow more gas from Lochard's Underground Gas Storage (UGS) facility to be injected into the VTS during winter period to reduce the risk of supply shortfall in the VTS during winter in the short term.

Iona's injection capacity is currently 530 TJ/d but is constrained by the SWP to 448 TJ/day. Once the Western Outer Ring Main (WORM) is completed in 2023, Iona will be able to inject up to 468 TJ/d into the VTS. Lochard has achieved FID in December 2020 to further increase their injection capacity to 570 TJ/d by 1 January 2023.

The SWP will be expanded to enable Iona's injection capacity at 570 TJ/d that is 102 TJ/d (post WORM) of additional gas supply capacity to the VTS during the winter peak period.

The forecast cost and timing of this project are shown in the table below.

Table 5 Proposed capital expenditure for SWP570

Security of supply expansion	Unit	2023	2024	2025	2026	2027	Total
SWP570	$m, $2022	36.9	53.1	7.3	0.0	0.0	**97.2**

(Note this number includes overheads of $7 million).

The costs associated with SWP expansion are likely to be allocated to the injection tariff rather than the withdrawal tariff.

Tariff/ bill impact for both compressors is about 2.2¢/GJ, representing:

- A little over $1 per year on a domestic customer bill
- About $11 per year for business customers.

7.5. Proposed Rule 80 application

If other proponents do reach FID at a later stage, APA VTS has proposed pre-approval under Rule 80 of the NGR.

Rule 80 provides for the AER, on application, to review a project and assess it against the conforming capital expenditure of Rule 79 outside of an access arrangement review process. If approved under Rule 80, the capital expenditure, if built would be classified as conforming capital expenditure at the start of the next access arrangement.

Importantly, there are no costs associated with the "Rule 80" projects in this access arrangement proposal. We propose a "pre-approved capex" pass through provision to allow the return on capital and operating expenditure to be recovered through tariffs should those projects come into service during the upcoming access arrangement period.

The 3-part Rule 80 application is lodged with this proposal. See VTS – Application under Rule 80 of the NGR – December 2021 – Public.

7.6. Regulatory investment safeguards for SWP expansion

At the highest level, the purpose of the economic regulation framework is to provide a certain and stable investment environment to attract private capital to build public infrastructure. This investment framework is often referred to as the "regulatory compact" – the implicit agreement between regulator and regulated underpinning the provision of capital.

A key element of the regulatory compact is the assurance given to the providers of capital that they will be able to earn a return on, and of, their invested capital. This assurance is a key element in the risk/reward decision-making process for investors to provide capital at regulatory rates of return.

Where the risk/reward balance has been affected by other factors, adjustments must be made to maintain the provision of private capital to public infrastructure.

In this case, the Victoria Government's Net Zero 2050 initiatives have challenged the regulatory compact's expectations around the ability of investors to recover their prudently invested capital. In the case of the SWP expansion, this is manifested in two ways:

1. It is not clear that there will be an ongoing role for the SWP expansion in the context of the Net Zero 2050 horizon, and
2. With mooted demand reductions, the SWP expansion investment may become exposed to the capital redundancy provisions of Rule 85 of the National Gas Rules.

Without adjustment to the regulatory framework to counterbalance the changes in risk introduced by the Net Zero 2050 initiatives, it will be very difficult for the necessary public infrastructure projects to attract private capital.

We consider that there are two avenues to adjust the regulatory framework to re-establish the regulatory compact risk/reward balance:

1. to increase the allowed return *on* capital to accommodate the additional risk associated with the return *of* capital, or
2. to provide greater certainty surrounding the return *of* capital such that the rate of return *on* capital remains appropriate.

The return *on* capital is governed by the AER's binding Rate of Return Instrument. Moreover, the AER, in its November 2021 Information Paper "Regulating gas pipelines under uncertainty",[7] expressed the view that asset stranding risk should not be compensated through the rate of return.

We consider that the more feasible option is to focus on the return *of* capital.

We propose to address this change in risk through adjustments to the return *of* capital provisions under this access arrangement. More specifically, we propose:

1. a maximum 30-year asset life be applied to the SWP expansion investment to align with the Net Zero 2050 horizon, and
2. a Fixed Principle (Rule 99) be included in the access arrangement that the investment in SWP expansion is not subject to the Rule 85 capital redundancy provisions (this would apply on an ongoing basis).

[7] See Regulating gas pipelines under uncertainty - Information paper | Australian Energy Regulator (aer.gov.au)

8. Western Outer Ring Main

8.1. Starting point

The Western Outer Ring Main (WORM) was proposed by APA (and supported by AEMO) for the 2018-22 access arrangement period capital program to address tightening of supply / demand balance forecast by AEMO in March 2017. The project is a high pressure, buried gas transmission pipeline, 51 kilometres long, which will provide a new connection between existing pipelines at Plumpton in Melbourne's west and Wollert in the north. The project also includes an upgrade to the existing compressor station at Wollert.

In the AER's 2017 Final Decision on the 2018-22 access arrangement for VTS, a total of $126.7 million ($2017) was included in the VTS capital program to undertake the WORM project. The WORM was justified based on the need to maintain system security.

In December 2019, the Victorian Minister for Planning determined that an Environment Effects Statement (EES) was required for the WORM. The Inquiry Panel Hearing commenced on 4 October 2021. The forecast capital expenditure for the WORM has increased from the 2017 approved

8.2. Stakeholder engagement

We presented on the progress of the WORM which had been approved by the AER for delivery in the current period. Stakeholders supported the project and questions were raised about the progress of building the WORM noting that it will have taken five years from the AER approval to project completion.

Concerns were raised about whether it could potentially face a stranding risk in the future considering changes in energy policy.

8.3. APA VTS proposal

During the preparation of the EES documentation, several environmental matters were identified that needed to be addressed including, an increase in number and length of horizontal directional drilling. In addition, the cost of meeting biodiversity offset obligations is significantly higher than originally forecast. The updated cost of the WORM is expected to be $184.5 million.

The key cost variances from the original forecast in 2017 are due to:

- Forecast increase in construction costs ($24 million) due to the number and length of horizontal directional drilling and rock disposal (the need for this discovered during the EES), additional EES conditions, Department of Transport requirements, and Covid related costs
- Land access and approval costs ($20 million) including the EES process itself, net gain offsets, land access compensation, cultural heritage salvage works
- Materials procurement ($7.5 million) due to higher steel prices and delays in placement of orders due to EES.

APA is currently preparing to go to market for pipeline and facilities construction. Depending on the planning approvals, we expect the WORM to be completed by mid-2023.

9. Hydrogen safety and integrity assessment

9.1. Starting point

In August 2021, Energy Ministers agreed on an expedited process to amend the National Gas Law, National Energy Retail Law, and subordinate instruments so hydrogen blends, biomethane and other renewable methane gas blends are brought within the national energy regulatory framework.[8]

The Energy Ministers' agreement will place an obligation on the gas pipelines to accept hydrogen blends in the gas stream. The safety and operational consequences of this potential obligation on the VTS must now be considered.

9.2. Stakeholder engagement

Over the course of the stakeholder engagement on the VTS access arrangement, we discussed the potential to repurpose the VTS to transport hydrogen. At the Capital Issues Workshop in July (prior to the Energy Ministers' announcement), we had suggested studying VTS pipelines to ascertain their ability to accommodate hydrogen in the gas stream.

Some stakeholders considered there was merit in an assessment being undertaken but there were concerns about the cost and who should fund such an assessment. Others did not support customers funding the study. There was also a request for APA to work with storage facility owners on the implications for them.

More generally there was a question about whether hydrogen 'was the answer' and concerns about costs to customers for changing to hydrogen compatible appliances. Stakeholder expressed concern at the lack of an overall policy on energy and climate change to drive these types of policy decisions.

To help stakeholders understand more about hydrogen, on 26 August 2021, we held a hydrogen information session to provide stakeholders with further details on the challenges and opportunities posed by introducing hydrogen into the VTS network. Following this, we presented the scope and costings to assess the impact of hydrogen blends in the VTS.

During this workshop, stakeholders posed a range of questions and raised several points including:

- A broad desire and need for public education campaigns about hydrogen and safety
- Acknowledgement that the transition from town gas (which was a mixture of hydrogen and carbon monoxide) to existing natural gas specifications required users to update their appliance burner configurations; and that this transition from natural gas to potential hydrogen blends will require similar appliance upgrades
- Suggestion for APA to align the scope of the technical assessment with distribution networks who are investigating the introduction of 10% blend of hydrogen
- Concern about the economics of hydrogen and the likelihood of achieving the Government's target of $2/kg
- Emphasis that there needs to be optimisation of costs between gas and electricity, noting that hydrogen couples both sectors
- A question as to whether APA would consider producing hydrogen in future
- General interest in other hydrogen projects and programs that APA is pursuing.

[8] Refer to Extending the national gas regulatory framework to hydrogen blends and renewable gases | energy.gov.au

The APA VTS First Look consultation document on 15 October 2021 provided information a high-level overview of the proposed hydrogen test program, the estimated costs, and subsequent tariff impacts. The costs shared with customers in the First Look document are the same as those included in the proposal.

APA VTS received two written submissions providing feedback on the hydrogen assessment in response to the First Look document. Feedback from one organisation requested further details about the test program and called for information to be provided to consumers about required appliance upgrades as well as reiterating concerns about funding the test program by customers.

A second written response was received from AEMO who is responsible for operating the VTS network. AEMO's response acknowledged the benefits of the proposed assessment and its contribution to providing information about the potential future of pipelines as Australia decarbonises. AEMO also identified the need to assess the network as a whole:

> *"as the pipelines in the VTS are interconnected, if hydrogen is blended into one pipeline, it will most likely disperse into the other pipelines. Therefore, the approach should be to assess all the VTS pipelines[2]".*

At Roundtable 12, we discussed the importance of the test program to understand and mitigate the safety and integrity implications of the Government's policy to expedite bringing hydrogen into the national gas market framework. APA also presented further information on the tariff and bill impacts of the safety assessment.

At this session there was broad acceptance for the need to complete an assessment of hydrogen-compatibility to support the transition of the gas network in a decarbonised future, but continued uncertainty as to the best source of funding. APA's tariff modelling estimates that the bill impact of this assessment is ~$2c/GJ which equates to $1.10 per year for domestic customers, and approximately $10 per year for business customers.

In addition to the VTS roundtable discussions, APA has received numerous unsolicited approaches by several developers seeking to produce hydrogen in Victoria. These developers view blending hydrogen into the gas network as a critical base offtake that will support the future of a hydrogen emerging industry. This demonstrates the growing need to assess the viability of the VTS to transport hydrogen blends, and the urgency to commence the process.

[1] APA notes that customer appliance testing is outside of the scope of this technical assessment. This assessment is focused only on the safety and integrity of the transmission pipeline network in response to the expedited amendments to the National Gas Law

[2] APA has optimised the costs in this access arrangement proposal by proposing a staged assessment methodology, as described in section 5.2.2

9.3. APA VTS consideration

Following the Energy Ministers' announcement, APA VTS considers that there is a need to undertake a technical assessment to understand the safety and integrity impacts of hydrogen on the VTS. The current challenge with repurposing the existing natural gas pipeline network is understanding what impact the introduction of hydrogen might have on the pipeline and its operation. When a steel

pipeline, like the existing VTS network, is exposed to high pressure hydrogen, hydrogen is absorbed into the steel and can degrade the material properties. This phenomenon is known as hydrogen embrittlement and has the potential to impact the integrity and safe operation of the pipeline if it is not quantified and understood.

Currently, there is no Australian Standard for design of new hydrogen pipelines or conversion of existing infrastructure. Plans are in progress that will develop these over the next five years. Work by gas infrastructure companies will provide much-needed technical data to support an evidence-based approach to developing these standards.

The VTS has been built over many years, with a wide range of pipeline extensions and expansions of varying vintages and materials. Absent detailed engineering testing, we do not have sufficient knowledge to understand the scope for the various pipelines comprising the VTS to safely accept hydrogen blends.

To maintain safe operation, and integrity of pipelines we need to undertake a technical assessment to understand the impact of hydrogen on VTS assets.

9.4. APA VTS proposal

APA is proposing to undertake an assessment to provide sufficient data to understand the impacts of hydrogen embrittlement on pipelines in the VTS. The information will allow APA to quantify the integrity impacts and suitability for hydrogen blending up to 10% by volume, and any remedial works or changes in operation required to ensure continued safe operation of the VTS.

The findings from the assessment will be used to support VTS strategic network planning by identifying which parts of the network are suitable for hydrogen blending, and which are not.

We propose to undertake an assessment of the VTS pipelines to ascertain their capability to accommodate hydrogen blends in the upcoming access arrangement period. The scoping and costing of the assessment are presented in the table below.

Table 6 Scope and cost of hydrogen safety and integrity assessment

Work scope	Cost est. $millions	High level description
Line Pipe Sampling	12.8	Excavation and collection of samples from in service pipelines
Line Pipe Testing	4.3	Testing of samples in air and hydrogen to assess material impacts
Lateral In Situ Inspections	5.8	Inspection of laterals (at offtake & delivery stations) for critical material properties
Pipeline Assessment Report	2.0	Collation of test results and assessment recommendations for each pipeline tested
Pipeline Assemblies Assessment	2.6	Pipeline Assemblies include main line valves and scraper stations. Assessment assumed to include site visit and desktop assessment
Facilities Assessment	7.3	Metering and offtake station assessment including type B equipment such as water bath heaters
Complex Facilities Assessment	0.9	Three facilities are assumed to require more complex assessment due to equipment on site (including compressors)
Safety Management Studies (SMS)	1.5	An SMS review for each pipeline involving project team, pipeline engineering, operations engineering, asset management and field services

Work scope	Cost est. $millions	High level description
Final Report	0.7	A final report collating all assessment findings and recommendations for line pipe, pipeline assemblies and facilities
Total	**37.9**	

This project is significantly informed and advanced by the work that APA has been doing on testing the Parmelia Gas Pipeline for hydrogen conversion. While the costs of the Parmelia project are not borne by VTS customers, the learnings from that project will significantly benefit and reduce the costs of the VTS testing.

Further information and program justification is presented in Business Case 200 - Evaluating and mitigating hydrogen safety and integrity (refer the filename VTS - BC200 AA23-27. Hydrogen safety and integrity - December 2021 - Public).

10. Security of Critical Infrastructure

10.1. Starting point

The energy sector is particularly susceptible to security threats. These threats are increasing as demonstrated by recent events worldwide.

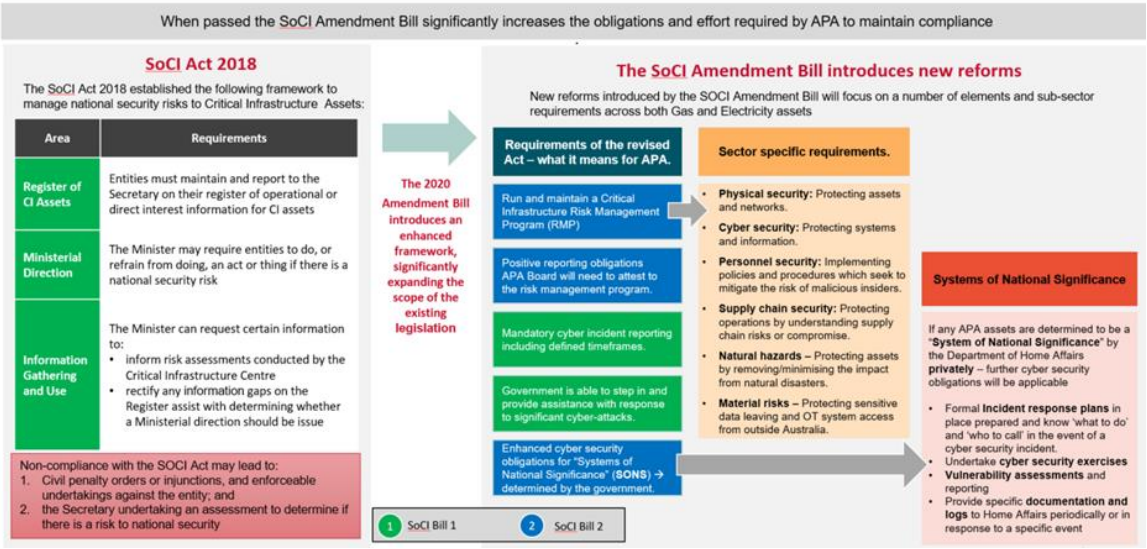
The Australian Government has proposed legislative measures to protect Critical Infrastructure. The existing Security of Critical Infrastructure Act 2018 (the Act)[1] will be superseded by the Security Legislation Amendment (Critical Infrastructure) Bill (SoCI Amendment Bill) 2020 [2], proposed to pass in two separate Bills to address urgent elements of the reform as soon as possible.

The first component of this, Security Legislation Amendment (Critical Infrastructure) Bill 2021 passed 22 November 2021 subject to Royal Assent, and the reforms are expected to be passed in their entirety by mid-2022.

APA Group (APA) is currently captured under the Act (2018) as the responsible entity for 22 Critical Infrastructure assets[3].

The Security of Critical Infrastructure Amendment Bill (SoCI 2020) introduces an enhanced framework, significantly expanding the scope of the existing legislation and governance rules requiring formally defined responsibilities and activities that support good risk practice and a greater awareness of threats and vulnerabilities to critical infrastructure assets.

The SoCI 2020 bill increases the number of APA Critical Infrastructure assets captured to 27, including an additional four renewable assets and power station, but also increases the obligations and requirements APA must comply with. The requirements of the SOCI Bill 2020 and the implications for APA are set out in the diagram below.



[1] https://www.legislation.gov.au/Details/C2018A00029

[2] https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bId=r6657

[3] Number of Critical Infrastructure assets enterprise wide which include 4 within VTS

The intent of the upcoming Security Legislation Amendment (Critical Infrastructure) Bill (SoCI Amendment Bill) 2020 reforms is to drive an all-hazards approach uplift in critical infrastructure resilience. The reforms assign penalty provisions to certain obligations and intend to appoint an appropriate regulator for the energy sector to monitor their implementation.

10.2. Stakeholder engagement

We presented APA's obligations under the Australian Government's Security of Critical Infrastructure (SoCI) framework and the work being undertaken to assess APA's obligations and the impact on the VTS. We presented some early forecasts for VTS site specific costs for physical security and SoCI cyber security related costs. The SoCI related cyber-security and physical security costs for VTS presented to stakeholders were based on our best estimates at the time, noting that APA's assessment of meeting SOCI obligations was continuing.

Stakeholders sought assurance that APA's response to meeting SoCI obligations was reasonable and proportionate. There was a concern that the quantum of costs to be incurred by APA VTS and stakeholders wanted to understand principles for allocating the costs between APA's regulated and unregulated pipelines and that the allocation is a fair, reasonable, and transparent.

10.3. APA consideration

The quantum of costs to meet the SOCI obligations has been carefully considered by APA. APA has undertaken a bottom-up and top-down modelling to assess the ranges and sensitivity analysis on the category of criticality. APA is an ASX listed company and faces the scrutiny by investors. APA is strongly focused on SoCI costs as a substantial proportion will be borne by APA security holders.

Gap analysis

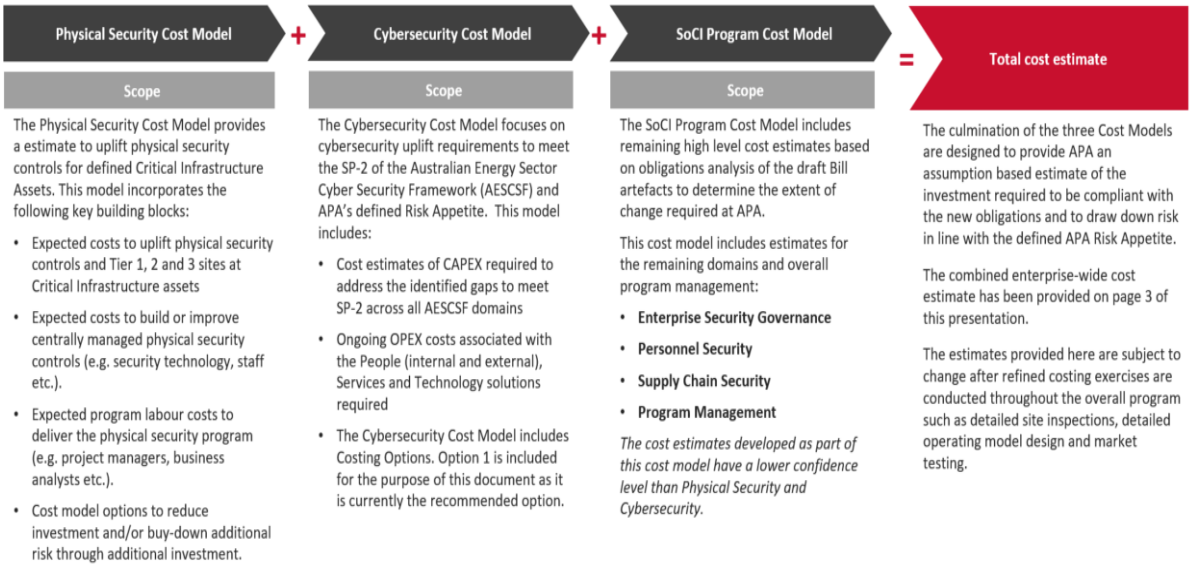
APA engaged EY to conduct a gap analysis of APA's capabilities to meet the SOCI obligations. EY found that the scope of obligations under SoCI 2020 is greater than the existing legislative mandate within SoCI 201 and that APA requires a range of capabilities to meet new compliance requirements in the following the domains:

- governance
- personnel
- physical security
- cyber security
- supply chain.

Forecasting methodology

The APA enterprise-wide SoCI program cost estimates incorporate information from three cost models – physical security, cyber security, and the remaining program domains (program costs).

An overview of the costing methodology is shown in the following diagram.



The VTS SoCI physical security costs have been based on the physical security cost model described in the diagram above. The VTS SoCI related physical security costs are site specific.

The costs for other domains - cyber security, program management, enterprise security governance, personnel security, and supply chain security have been allocated a proportion of costs based on the APA's Cost Allocation Method as described in section 4.

10.4. APA VTS proposal

The SoCI legislative framework is imposing new obligations on APA VTS. This is imposing incremental capital expenditure (and operating expenditure) costs on APA VTS. To be clear, the SoCI program and forecasts is separate from the IT portfolio forecasts (as discussed in section 11).

The proposed capital forecasts for the APA VTS SoCI program have been categorised in SoCI cyber, SoCI physical (VTS site specific costs) and SoCI program costs (the remaining domains) is presented in the table below. The total SoCI program cost is shown in the following table.

SOCI program	Unit	2023	2024	2025	2026	2027	2023-2027
SoCI Program, cyber, physical		3.9	4.0	3.6	3.1	0.4	15.0
Total	**$m, $2022**	**3.9**	**4.0**	**3.6**	**3.1**	**0.4**	**15.0**

The proposed operating forecasts for the APA VTS SoCI program is presented in the table below. The new and incremental operating costs have been included as a step-change in the operating expenditure base-step-trend method forecasts (refer section 13).

SoCI Program	Unit	2023	2024	2025	2026	2027	2023-2027
SoCI Progam, cyber, physical	$2022	1.3	1.3	1.3	1.3	1.3	6.6
Total	$2022	**1.3**	**1.3**	**1.3**	**1.3**	**1.3**	**6.6**

SoCI information and program justification has been submitted to the AER on a confidential basis.

11. Information Technology portfolio

11.1. Starting point

APA's enterprise-wide Information Technology (IT) portfolio enables core business information, communication, and operational technology to respond in an effective way to the energy sector shift to decarbonisation, decentralisation, and digitisation and to protect APA against cyber security threats. (The SoCI program has been discussed separately in section 10).

Information, communications, and operational technology is necessary to support everyday business functions and technical operations of assets. The shift to digitisation is playing a greater role in more aspects of the day-to-day operations in energy.

Investment in fit-for-purpose information, communication and operational technology is necessary to enable APA to continue to operate efficiently and deliver reliable, secure and safe services to customers. Fit-for-purpose systems are crucial for APA to remain compliant with regulatory obligations including regulatory information notices. Fit-for-purpose Information, communication and operational technology is crucial for APA to operate effectively in the complex energy market.

APA's IT program provides enterprise-wide delivery of business transformation, continuous improvement initiatives and technology solutions and maintains and protects APA's operations. The enterprise-wide approach to information, communication and operational technology provides economies of scale and scope in the delivery of services.

The enterprise-wide approach (rather than a stand-alone approach) enables customers to benefit from lower costs. This benefit applies to both customers of APA's regulated and unregulated assets. The economies of scope allows APA to apply the enterprise-wide information and technology systems to support customers and asset management across APA.

APA's Information Technology organisation covers the following core functions:

- **EPMO (Enterprise Program Management Office)**. Responsible for ensuring projects deliver optimum business value as early as possible and ensuring a continuous improvement focus
- **Operational Technology**. Ensures APA has appropriate, resilient, and high performing real time systems and engineering applications, data, and solutions
- **Information & Technology**. Partners with business units to deliver end to end I&T solutions.

Effective information, communication and operational technology is vital to ensure that we can meet regulatory obligations and continue to provide safe and secure services and provide information for our customers and community.

11.2. Stakeholder engagement

We presented information to the VTS stakeholder engagement group on the IT program and the key drivers for the expenditure requirements.

Feedback we received from the stakeholder engagement group, was to ensure that the IT program was proportionate and efficient. The stakeholders sought assurance that proposed expenditure was efficient and that the APA-enterprise wide costs (shared costs) were being allocated to VTS in a fair, reasonable and transparent manner.

The First Look consultation document contained information about the cost allocation methodology applied to shared costs. During Roundtable 10 we presented information on the cost allocation applying the VTS. This allocation is 8.2% of total corporate costs.

11.3. APA VTS proposal

APA has legacy systems that are out of support and are at end of technical life. The need for replacement of these systems is driven by:

- Poor condition
- No longer fit-for-purpose
- Obsolete including no or limited warranty/ support and service from vendors
- Hard to find components and spare parts and outdated software.

Replacement of out-of-date systems are necessary to bring some of our legacy systems to good practice standard. These include the programs that are part of the EPMO portfolio.

Key drivers impacting the Information Technology portfolio are set out in the following table.

Key drivers impacting Information Technology portfolio	
Replacement of obsolete legacy systems	• APA has several legacy systems that are reaching end of technical life • The need for replacement driven by poor condition and obsolescence including no or limited warranty/ support and service from vendors
Migration to cloud-based services	• IFRC clarification to accounting standards for cloud migration (Software as a Service and Platform as a Service) has influenced consideration of whether programs were operating or capital expenditure • Due to this accounting clarification, a higher proportion of cloud-based business solution costs are being allocated to operating rather than capital expenditure • Noting that Operational Technology projects would remain as capex.
Routine upgrades and maintenance	• Ongoing programs will be maintained and updated as required on a routine basis in line with vendor requirements. • Ongoing maintenance is required to mitigate the risks associated with system failure.

Expenditure forecasts

The forecast operating and capital expenditure for Information Technology portfolio is based on best information we have to date about the scope of information, communication, and operational business solutions. The scope of the programs is subject to ongoing assessment and a better understanding of APA requirements will be available in early 2022.

The cost estimates have been based on the best judgement of external consultants and APA subject matter experts.

APA VTS customers benefit from economies of scale and scope in the delivery of services of APA's enterprise-wide approach to IT (rather than a stand-alone approach for each asset). This allows customers to benefit from lower costs for the services that the Information Technology portfolio enables and supports.

Further, APA Group is a listed company and costs are scrutinised by market investors and security holders. This may provide stakeholders with some assurance that the Information Technology portfolio are proportionate, prudent, and efficient.

11.4. APA VTS proposal

VTS is allocated a cost of the Information Technology portfolio costs budget on the discussed cost allocation method using a revenue allocation. This allocation is 8.21% of total corporate costs.

The proposed capital forecasts for EPMO, Operational Technology and I&T is shown in the table below. Total Information Technology portfolio forecasts for APA VTS is $9.9 million.

Information Technology portfolio	Unit	2023	2024	2025	2026	2027	2023-2027
EPMO	$2022	2.1	2.1	1.2	0.4	0.4	6.2
Operational Technology	$2022	0.8	0.8	0.6	0.7	0.7	3.5
Information Technology	$2022	0.1	0.0	0.0	0.1	-	0.2
Total	$2022	**3.0**	**2.9**	**1.9**	**1.2**	**1.1**	**9.9**

The migration of technology business solutions to cloud-based services means that we have forecast an increase in new and incremental costs to operating expenditure, rather than capital costs. This is due to clarification of accounting standards.

The IFRIC Interpretations Committee (IFRIC®) has published two agenda decisions clarifying how arrangements in respect of a specific part of cloud technology, Software-as-a-Service (SaaS), should be accounted for. Following the clarification of the accounting standards for cloud-based computing more software-as-a-service is being treated as operating expenditure rather than capital expenditure. Further information on the accounting clarifications is provided in the Information Technology. Information Paper referred to below).

Information Technology portfolio	Unit	2023	2024	2025	2026	2027	2023-2027
EPMO	$2022	2.4	3.0	1.7	1.1	1.1	9.2
Operational Technology	$2022	0.0	0.0	0.1	0.1	0.1	0.2
Information Technology	$2022	-	-	-	-	-	-
Total	$2022	**2.4**	**3.0**	**1.7**	**1.1**	**1.1**	**9.4**

The new and incremental operating costs have been included as a step-change in the operating expenditure base-step-trend method forecasts (refer section 13).

More information on the Information Technology portfolio and programs and projects by each of the functions is presented in the VTS Information Technology. Information Paper (filename VTS - VTS AA23-27 Information Technology. Information Paper - December 2021 - Public).

12. Decarbonisation and depreciation

12.1. Starting point

In a recent paper, the AER stated that the regulatory regime supports the recovery of sunk costs as regulatory depreciation and that it used an approach where regulatory depreciation is recovered evenly over an asset's useful life. AER offered that economic theory suggests sunk costs be recovered in the 'least distortionary way' meaning that customers do not bring forward or delay consumption/ replacement simply due to the depreciation profile.[9]

AER's comments relate more to businesses that are in a steady state, like electricity, but less so for gas. Our view is that we are at moment in time when the future of gas in Victoria is uncertain, and it is not in steady state.

12.2. Stakeholder engagement

The key theme throughout this access arrangement consultation process is the Victorian Government's Net Zero 2050 initiatives and their impact on future gas consumption levels.

We presented the view that under the legislated Victorian Government policy there is a risk that the VTS assets will not be in service long enough to recover the value of the assets over what was originally set as their life. That is, the government driven policy change affects the economic life of prudent and efficient investments.

We presented the view that these investments need to be recovered from users as part of the 'regulatory compact'. We proposed that this could be achieve through reducing asset lives to accelerate depreciation and/ or removing the inflation indexation of the regulatory asset base (RAB) (on which we earn a rate of return). After discussing removing RAB indexation with the stakeholders and the AER, we decided not to pursue this option as it is not feasible without amending current regulatory instruments.

At first, there was mixed response to the proposal to accelerate depreciation. Some stakeholders noted that in the future, VTS may carry hydrogen or other gases therefore maintain economic life of the VTS assets. Other stakeholders considered that future generations should not be burdened with costs of assets that benefit current generations and were not opposed to accelerated depreciation for this reason.

In response to the First Look consultation document, one consumer group (who started attending APA roundtables in xxx) considered that the proposal to accelerate depreciation to be an approach that will primarily manage the networks' risk only and should not be allowed.

However, at Roundtable 11, the Principle of reducing asset lives and accelerated depreciation was accepted by most stakeholders, as commented

"Logic says …start sooner rather than later,
but make it a smaller amount all the way across"

[9] AER (2021) Draft Better Resets Handbook Towards Consumer Centric Network Proposals, September 2021

To reduce the impact the accelerated depreciation on tariffs for customers, we have increased the maximum–life-of-asset cap from 25 to 30 years. This has the effect of reducing tariffs.

During R11, APA VTS's preferred tariff scenario included a 30-year cap on the maximum life of assets. Where the move to a 25 year asset life would have increased tariffs by approximately 6.3¢/GJ (about $3.42 per year for a residential customer), the move to a 30 year life limits the tariff impact to approximately 3.3¢/GJ (about $1.80 per year for a residential customer).

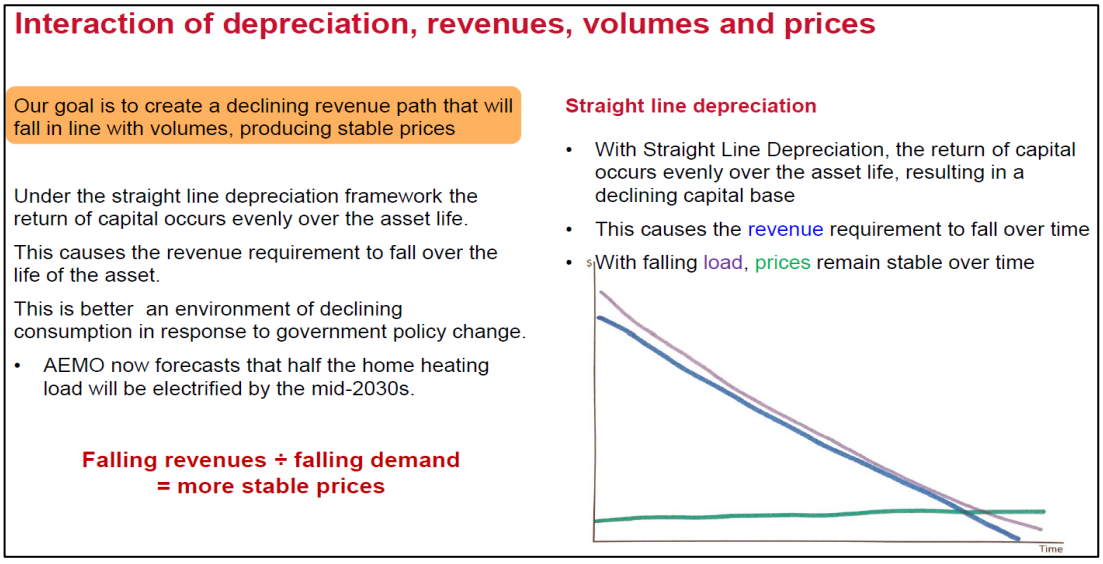
12.3. APA VTS consideration

Shortening assets lives is a way to bring forward recovery of efficient costs (approved as conforming capital expenditure).

We are concerned that, as gas consumption levels decline, unit costs will increase, thus causing customers to leave the gas market sooner and perpetuating a 'death spiral'.

As decarbonisation increases pace, customers with energy choice are likely to shift to electrical appliances. And so, leave behind a cohort of customers who do not have the ability to exercise choice in their energy solutions. For example, hard-to-abate manufacturing businesses and low-income families living in rental accommodation have limited energy choice. We are concerned that the decisions we make today may have a significant adverse impact on customers in vulnerable circumstances in the future.

The landmark work by renowned regulatory economists Crew and Kleindorfer[10] has proposed a way forward in circumstances such as this. Known as the WOOPS model, Crew and Kleindorfer note that there is a Window of Opportunity (WOO) to return capital to investors and reduce the future revenue requirement through small increases in tariffs while utilisation remains high. Failure to act early may result in the Window of Opportunity being Passed (WOOPS).This was discussed at the Stakeholder Forum, Roundtable 9 as shown in the following diagram.



[10] See Crew, M and Kleindorfer, P, 1992, "Economic Depreciation and the Regulated Firm under Competition and Technological Change", Journal of Regulatory Economics, 4(1), 1992, pp. 51-61.

Our proposed approach, in line with the WOOPS model, is to start early to recover relatively small amounts of prudently invested capital from users while gas usage is still high. This will facilitate smoother tariff impacts by reducing tariff impacts in later years as the system usage starts to decline.

Importantly for this access arrangement proposal, our goal is to allow the amount of invested capital to decline in line with reductions in volumes, and to keep tariffs as stable as possible as we transition to a decarbonised energy industry. This approach helps facilitate a more orderly transition by smoothing the price path and avoiding price shocks in the future.

12.4. APA VTS proposal

Considering the decarbonisation policies that are in place, we consider that accelerated depreciation is a sensible and less risky approach that will benefit energy consumers, rather than a 'do nothing' approach.

APA proposes to "*start small, start early and monitor*". That is,

- Start accelerating depreciation of assets early with small tariff increases while gas use is still high, and
- Monitor progress at every 5-yearly access arrangement review to ascertain whether reductions in the VTS revenue requirement are aligning with reductions in demand, and to adjust the relevant regulatory settings accordingly.

We consider adopting the WOO/ WOOPS principles allows for a more equitable (intergenerational) approach. Current users contribute to accelerating depreciation of assets rather than leaving later generations to bear the burden with higher prices. If the VTS can be repurposed for hydrogen, then asset lives can be reviewed during the access arrangement revision.

Our preferred approach is to reduce the standard and remaining asset lives to align with the Net Zero 2050-time horizon.

This will mostly affect the "pipelines" and "compressors" asset classes. The impact of this change on existing assets is quite small, as the "pipelines" class currently has a weighted average remaining life of approximately 34 years, and the current weighted average remaining life of the "compressors" class is about 18 years (shorter than the 2050 horizon). This change will also affect the "buildings" asset class, although this accounts for a small proportion of total invested capital.

The proposal to reduce the standard asset lives does have an impact on the depreciable life of the Western Outer Ring Main (WORM) and the proposed SWP570 expansion.

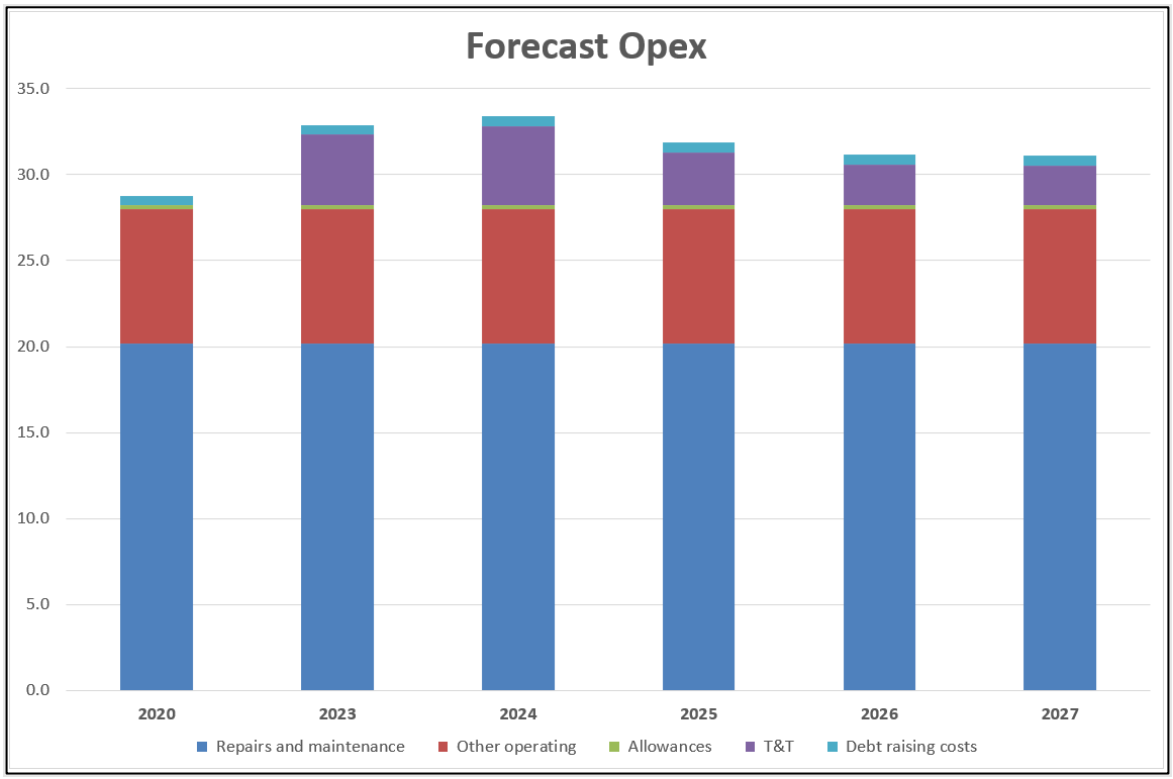
13. Operating expenditure

13.1. Base step trend approach

We have applied the AER's preferred base-step-trend approach to operating expenditure forecasting, using a 2020 base year (the last complete year at time of writing), as reported to the AER in response to the 2020 Annual Reporting Regulatory Information Notice.

At this stage we have forecast that ongoing operating expenditure will remain flat in real terms from the 2020 levels.

Table 7 Forecast operating expenditure ($millions)



As discussed at the stakeholder roundtables, we have added step changes for the operating expenditure associated with the Information Technology portfolio forecasts, which address both IT systems migration to the cloud, and also operating cost components of the Security of Critical Infrastructure requirements.

VTS customers benefit significantly from being part of the APA Group portfolio of energy infrastructure assets, in two ways:

1. As a larger group, APA achieves significant economies of scale in developing systems and processes at a national level rather than for an individual business. The VTS incurs only a portion of the overall costs, which is less than the costs that would be incurred were the VTS a stand-alone business.

2. VTS customers benefit from the focus on cost efficiency through APA's operation of businesses whose revenues are determined through bilateral contracts. If APA's costs increase, these costs cannot be recovered from bilaterally contracted users. This places a sharp focus on all costs.

Where APA incurs costs nationally, those costs are allocated among the operating businesses using a consistent cost allocation methodology. Importantly, this cost allocation methodology is applied consistently across all of APA's fully regulated, light regulated and Part 23 pipelines, and unregulated businesses. Further information on cost allocation is presented in section 4.

14. Rate of return - Weighted average cost of capital

14.1. Starting point

The VTS access arrangement will be subject to the AER's binding Rate of Return Instrument, which specifies the methodology to be applied in determining the costs of debt and equity reflected in the access arrangement proposal.

The 2018 Rate of Return Instrument is currently in effect, which provides for a Weighted Average Cost of Capital (WACC) to be calculated based on a 60% gearing ratio applied to calculated benchmark costs of debt and equity, determined as follows, in summary:

Cost of Equity	Cost of debt
Capital Asset Pricing Model **Risk Free Rate based on yields of 10-year Commonwealth Government bonds** **Beta = 0.6** **Market Risk Premium = 6.1%** **Gamma = 0.585**	Based on a 10-year rolling average of BBB+ rated corporate debt with a 10-year maturity, updated annually through the access arrangement period.

14.2. Stakeholder engagement

During stakeholder engagement and in the First Look document, we applied the Rate of Return Guideline calculating a cost of equity based on the 20 trading days up to 28 September 2021, 1.243%, delivering a Return on Equity of 4.903%.

The cost of debt applied by the AER in its most recent cost of debt update, as reflected in the VTS 2021 tariffs, is 4.31%. This cost of debt has been applied in this first look modelling which, when combined with a forecast cost of debt based on current observations, results in a declining trailing average portfolio return on debt as follows:

	2023	2024	2025	2026	2027
Trailing average portfolio return on debt	3.85%	3.63%	3.40%	3.22%	2.94%
Return on Equity	4.90%	4.90%	4.90%	4.90%	4.90%
Nominal Vanilla WACC	4.27%	4.14%	4.00%	3.89%	3.73%

Consistent with the Rate of Return Guideline, we have applied a Gamma rate of 0.585 and a corporate tax rate of 30%.

We had indicated to stakeholders that the rate of return was a matter on which we would inform them about as there was minimal scope for influence from stakeholders.

14.3. APA VTS proposal

Forecast regulatory cost of capital is derived from the application of the AER's 2018 Rate of Return Instrument. Based on a risk free rate of 1.243% (based on September trading data for 10-year Commonwealth bonds, as reported by the Reserve Bank of Australia), the resulting cost of equity is 4.903%.

The cost of debt assumes that the cost of debt applied in the calculation of the portfolio cost of debt is equal to the most recent on-the-day rate as advised by the AER in the most recent cost of debt update (October 2021), 2.43%. The outturn 2023 regulatory WACC is 4.27%.

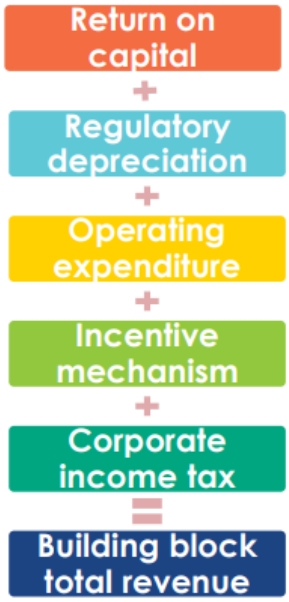
15. Proposed total revenue for VTS

15.1. Starting point

Rule 76 of the National Gas Rules defines the building block approach. This is the method for calculating regulated revenue for the VTS. Rule 76 is in that part of the Rules for price and revenue regulation.

To help inform stakeholders we presented on the building block approach as it applied to determine the prices – the reference tariffs – of an access arrangement.

The discussion of building blocks helped explain to stakeholders the aspects of access arrangement revision on which we were seeking stakeholder input.



15.2. Stakeholder engagement

The building block approach was depicted as shown in the adjacent diagram. Throughout the stakeholder consultation roundtable sessions, we discussed several initiatives and scenarios that impacted on the building block components being considered for the VTS access arrangement going forward.

The scenarios reflected the range of assumptions we were considering and testing with stakeholders. As these scenarios were tested early in the regulatory modelling process forecasts were updated as better information became available.

Each of scenarios had an impact on the revenue requirement which flowed through to tariffs. The impact on tariffs is discussed in section 16.

The draft forecasts in the scenario analysis allowed comparison of the relative variation to tariffs from different scenarios and assumptions. The stakeholder feedback we received on the scenario analysis helped to form our proposal.

15.3. APA VTS proposal

The proposed revenue is calculated from proposed building block components. The proposed revenue is calculated from:

- Return on capital is the WACC applied to the capital asset base
    - Proposed capital expenditure forecasts are rolled into the capital base. Forecast capital expenditure is discussed in section 5
    - WACC is discussed in section 14
- Depreciation is removed from the capital base. Depreciation is discussed in 12
- Operating expenditure forecast is based on the ‘base-step-trend’ approach as discussed in section 13.

The total (unsmoothed) revenue requirement arising from this suite of proposal is as follows:

Building Block Components ($m, Nominal)	2023	2024	2025	2026	2027
Return on Capital	48.39	51.38	52.89	51.39	48.99
Return of Capital (regulatory depreciation)	24.92	36.20	44.86	50.67	48.64
Operating Expenditure	36.00	37.99	38.07	39.28	40.07
Revenue Adjustments	0.07	- 1.58	- 2.95	-	- 0.82
Net Tax Allowance	-	-	-	-	-
Total Revenue (unsmoothed)	109.38	123.99	132.87	141.34	136.87
Smoothed - Forecast Revenue	**115.45**	**121.79**	**128.48**	**135.54**	**142.99**

The key assumptions in calculating the revenue requirement include:

- Cap the maximum standard asset live to 30 years (accelerated depreciation)
- Proposal to construct SWP570
- Include revised cost for the WORM
- Include hydrogen safety and security assessment.

The proposed revenue has been used to derive the tariffs.

16. Proposed tariffs and what it means for customers

16.1. Starting point

APA VTS provides one pipeline service, the tariffed transmission service. The tariffed transmission service is a zonal-distance-based volume tariff, with no capacity component. Reference tariffs recover the total revenue allocated to the reference service over the access arrangement period.

This approach equalises revenue derived from the application of reference tariffs with the total reference service revenue requirement if assumptions regarding costs and demand hold.

16.2. Stakeholder engagement

In the First Look document and Roundtables 10 and 11 we presented draft tariff outcomes under a range of scenarios and revenue outcomes.

To make the results easy to understand we showed VTS tariffs as a composite average $/GJ tariff. The composite tariff incorporated both injection and withdrawal tariffs based on an overall system-wide average. The composite tariff is the average of total revenues over the five-year period divided by the total volumes of the five-year period.

For the total volumes for the five-year period, we used an estimate of the average system wide throughput over the relevant period. We assumed VTS transports an average 192 PJ (192,000,000 GJ) of gas per year.

- Base case: Pipeline asset lives 55 years, with indexation of asset base, with SWP570; with hydrogen assessment
- Scenario 1. Shorten asset lives to 25 years (accelerated depreciation)
- Scenario 2. Without indexation of the regulatory asset base
- Scenario 3. Without SWP570 capital expenditure
- Scenario 4. Without hydrogen assessment.

The scenario analysis showed the tariff impact applying assumptions for asset lives, SWP570 expansion, hydrogen testing and removing indexation of capital base.

Feedback from customer and consumer advocates on the tariff scenario analysis reflected concerns about energy affordability across the gas supply chain. We heard that although gas transmission costs contribution to the bill stack is relatively low compared to other components, other bill components also have the potential to increase significantly in the upcoming period. This increase can often be in response to the same drivers impacting the transmission revenue proposal.

There was concern about the economic stress that high energy costs will cause for Victorian households, especially low-income and vulnerable consumers. Of particular concern, customers receiving assistance are facing higher levels of debt than before the pandemic. Therefore, the prospect of increased revenue and tariffs for the gas transmission businesses was a concern.

16.3. APA VTS proposal

Taking into consideration concern about energy affordability and impact of tariff increases on customers, we reviewed the key assumptions to see how we could minimise tariff increases.

To minimise the impact of tariff increases we propose to:

- Increase the maximum asset lives capped at 30 years (rather than 25-years as modelled in Tariff scenarios)
- Stage the expansion of the SWP570 during the period (rather than constructing in one year)
- Apply only a CPI increase to average tariffs from 2022 to 2023, followed by annual increases in CPI+3.4%.

System-wide tariffs

System-wide tariffs are total annual the revenue for the year divided by the total volume for the year.

The system-wide formula is depicted as:

$$\frac{\text{Total revenues for the year}}{\text{Total volumes for the year}}$$

The trend in system-wide tariffs is shown in the below table. The VTS system average tariff across domestic and business customers, will rise from current levels of approximate 55¢/GJ to approximately 72¢/GJ over the period.

Table 8 Actual and forecast system wide tariff 2018 to 2027

Year	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Volumes (PJ)	220	229	222	225	206	206	203	201	197	198
Target revenue($m nominal)	108	110	111	112	113	115	122	128	136	143
System wide average tariff $/GJ	0.49	0.48	0.50	0.50	0.55	0.56	0.60	0.64	0.69	0.72

Composite tariff

The composite tariff formula is depicted as:

$$\frac{\text{Total revenues 5-year period}}{\text{Total volumes 5-year period}}$$

The five-year composite tariff increases from $0.52/GJ in the current period to $0.61/GJ

Table 9 Composite tariff 2018-2022 and 2023-2027

Period	2018-2022	2023-2027
Composite tariff $/GJ	0.52	0.61

16.4. Impact on residential and small business

In this section, we present the impact of proposed tariffs on residential customers and small business customers.

Residential customers and small business customers supplied by gas through a contract with energy retailers. Victorian gas retail tariffs are an amalgamation of upstream gas supply costs, VTS gas transmission costs, gas distribution costs (through their local distribution business) and retailer costs.

To assess the impact of the proposed tariffs changes for the VTS reference tariff, we have calculated the standard bill impacts based on the Victorian Essential Services Commission Victorian Market Update: June 2021.[11]

This report uses standard measures of residential and small business consumption levels and annual costs as follows:

Table 10 Average consumption and average of residential and small business customers

	Residential	Small business
Annual consumption (GJ/year)	54.4	500
Annual gas bill	$1,350	$9,426
Average retail cost of gas ($/ GJ)	$24.82	$18.85

Accordingly, APA VTS has demonstrated the impact of changes to its tariffs against these standard benchmark tariffs to residential and small business end use customers, as shown in APA VTS 2023-2027 - Reset RIN - Workbook 5 lodged with this access arrangement submission.

As the VTS tariffs vary by tariff zone and by tariff class (V vs D), APA VTS has applied a “system average tariff”, calculated as total revenue divided by total volumes.

Applying these published retail tariffs, the benchmark retail tariff is compared to the average VTS transmission tariff, as outlined below.

The impact of the tariff on the average residential customer bill from 2022 to 2023 is $0.22 (22 cents). As shown in the table below that VTS component is just over 2% of average annual residential customer gas bill.

[11] Refer to APA VTS 2023-2027 - Reset RIN - Workbook 5 - Indicative bill impact

Table 11 Impact of proposed VTS tariffs on average bill of residential customers

Residential customers	2022	2023
Average annual gas bill 2022 ($)	1350	1350
Average annual consumption GJ/year	54.4	54
Average cost of retail gas ($/GJ)	24.8	25
Bill impact		
Average VTS system-wide tariff ($/GJ)	0.5566	0.5607
Average annual VTS component of retail bill ($)	30.28	30.50
Change ($)		0.22
As a proportion of 2022 average gas bill	**2.24%**	**2.26%**

A benchmark residential consumer using 54.4 GJ of gas per year would expect to be billed approximately $1,350 per year for retail gas costs.

The same approach applied to small business customers is shown below. The increase in average system-wide tariffs in 2023 is $2.05. As shown in the table below that VTS component is under 3% of average annual residential customer gas bill.

Table 12 Impact of proposed VTS tariffs on average bill of small business customers

Small business customers	2022	2023
Average annual gas bill 2022 ($)	9426	9428
Average annual consumption GJ/year	500	500
Average cost of retail gas ($/GJ)	18.85	18.86
Bill impact		
Average VTS system-wide tariff ($/GJ)	0.5566	0.5607
Average annual VTS component of retail bill ($)	278.30	280.35
Change ($)		2.05
As a proportion of 2022 average gas bill	**2.95%**	**2.97%**

Under the proposed 2023 VTS tariff a benchmark small business customer using 500 GJ of gas per year can expect to pay approximately $9,428 per year for its gas supply.

16.5. VTS tariff model

The analysis using a composite tariff have been prepared to show in a simple way the average tariff impact. In practice, the actual tariffs are more complex and the VTS tariff model is used to derive cost reflective tariffs.

The revenue used to derive the tariffs in the VTS Tariff model are calculated using the AER's Post-tax revenue model (PTRM).

The AER's PTRM derives an annual revenue allowance, and a net present value (NPV) of revenues to be earned over the course of the five-year regulatory period. The X-factors derived from the PTRM are indicative and will be different from the X-factors that drive the VTS tariff model.

The primary constraint on this tariff model is that the combination of proposed tariffs and forecast volumes must deliver, over the five-year period, the same NPV of revenues as approved by the AER through the PTRM. However, the derivation of tariffs for particular zones may mean that the pattern of revenue derivation over the five years differs from the PTRM.

APA VTS operates under the Declared Wholesale Gas Market (DWGM) structure unique to Victoria. All other transmission pipelines in Australia operate under a contract carriage model. This has several important implications as follows:

- As the DWGM allocates pipeline capacity by the operation of the bidding process for gas, tariffs are necessarily flow based, as market participants cannot reserve capacity under contract for their exclusive use.
- The setting of tariffs must be based on a forecast of the gas flow paths. However, since APA VTS operates under an incentive-based regulatory model the tariffs, once tariffs are set, they cannot be altered.
- To the extent that the actual flow paths differ from the forecast, the cost allocation outcomes to customers (and the revenue received by APA VTS) may be different. This can occur even where the total forecast is accurate, but the expectation of where gas will be sourced differs materially from the forecast.[12]

The principle underpinning the tariff model is to allocate costs to each user in proportion to that user's use of the transmission system assets. Therefore, a user who uses a short section of the system will, in general, pay a lower amount for using the system than a user who uses a longer section of the system.

The specific assets that are used by a user are determined by the physical path taken by the gas flow from the relevant injection zone to the user's off-take. The relevant injection zone for each off-take is determined by a process of allocating the forecast injection volumes from each injection point to the off-takes based on the physical flow dynamics of the system, until the injection volumes have been exhausted. Most of the system is assumed to be supplied from Longford, since this is where the greatest volumes are injected. To the extent that the injection volume forecast is changed, the physical paths will also change.

The transmission system has been divided into 29 pipeline segments (now including the WORM), determined by the points at which pipeline diameter changes.

Injection and withdrawal tariffs

In the VTS (under the Declared Wholesale Gas Market) market participants can operate as:

- Injecting parties (suppliers), or as

[12] Note that this does not occur under a contract carriage model, as the user contracts for capacity in a pipeline over a given flow path, and its charges are related to that pre-specified path.

- Withdrawing parties (buyers).

The DWGM is a mandatory market that assumes that all gas is injected to the system and delivered to a central "market" where it is traded and then delivered from the central "market" to a specified withdrawal point. The VTS tariff model is therefore structured to produce injection tariffs and withdrawal tariffs. The current tariff structures (and the tariff model) have been in place for over 20 years.

The VTS model calculates injection and withdrawal tariffs on a granular zonal basis. Zonal tariffs reflect the cost of the assets used to serve each of the zones and are therefore cost reflective.

Injection tariffs

The injection tariff applies to suppliers and recovers the costs of "injection" pipelines. There are five injection points on the VTS:

- Longford
- Port Campbell
- Pakenham
- Dandenong
- Culcairn.

To signal peak use to market participants (which drives expansion costs), the injection charge is levied on the ten peak injection days over the winter at each injection zone.

If a supplier injects on a top-ten peak day, it pays the injection charge. If a supplier injects on a non-top-ten peak day, it does not attract an injection charge. The top-ten peak days are not known in advance.

A smoother payment schedule is provided to users whereby injection charges are forecast annually for each injector and levied monthly on a sculpted profile. An injection charge 'wash-up' is performed after September each year when the actual peak days are known.

Withdrawal tariffs

The withdrawal tariff applies to buyers who procure their gas. The withdrawal tariff recovers the cost of transmission from the DWGM "market" to the user.

The system is divided into 25 withdrawal zones, and tariffs levied on the withdrawing user. Within each withdrawal zone there are up to three tariff classes. These tariff classes are:

- Tariff-D (Demand)
- Tariff-V (Volume)
- Cross-system tariff (supplements other tariffs in some circumstances).

The cost of transmission through the withdrawal zones is based on a forecast of physical flows. That is, they recover the costs of withdrawal pipelines on an "any day" per GJ throughput, rather than capacity, basis.

The withdrawal tariffs are subject to a flow analysis model:

- downstream deliveries must contribute to upstream pipelines, and

- a “cross system” tariff for gas that crosses the metro area.[13]

Withdrawal tariffs distinguish between the end use of the gas “Tariff V” (Volume) and “Tariff D” (Demand). The withdrawal charge is levied on the actual flows each month (an ‘anytime’ charge).

Summary

In summary, the VTS tariff model:

- Derives separate tariffs for injections to and withdrawals from the system
- Allocates capital costs to tariff zones based on forecast gas flows
- Allocates common costs on a postage stamp basis, and
- Allows for adjustments to the allocation of common costs to manage tariff impacts.

The scope for adjustment is necessary for several reasons, for example, to derive matched injection/ withdrawal tariffs. The DWGM, and the related VTS tariff model, assume that all gas is injected to the system and delivered to a central “market” where it is traded and then delivered from the central “market” to a specified withdrawal point. Where the withdrawal point is along the injection pipeline – for example injections at Culcairn and withdrawals at Wodonga - the model outcomes need to be adjusted as they deliver tariffs that are too high.[14]

More details about the VTS tariff model and the tariff derivation process is described in more detail below, and in RIN response document VTS - B.15.2 Tariff derivation - December 2021 – Public. A brief explanation of the tariff structure was presented at Roundtable 4 - VTS - VTS Roundtable 4 Revenue building block - 6.03.21 - December 2021 - Public.

[13] Where gas is considered to be sourced from Longford and delivered to points west of Melbourne, it must have its pressure reduced at the Dandenong City Gate in order to cross the high consequence Metro area at lower pressure. It must then be re-pressurised at Brooklyn for delivery to points west. The cross system tariff is designed to recover these costs.

[14] In the Culcairn injection – Wodonga withdrawal example, the unadjusted tariff model would levy an injection charge to bring gas from the Culcairn injection point to the central DWGM market, and then levy a withdrawal tariff to take the gas from the central DWGM market to the Wodonga delivery point, when indeed gas injected at Culcairn and withdrawn at Wodonga is using very little of the broader VTS system.

Glossary

Acronym	Name	Acronym	Name
AA	Access Arrangement	**PTRM**	Post-tax revenue model
AEMC	Australian Energy Market Commission	**RAB**	Regulatory Asset Base
AEMO	Australian Energy Market Operator	**RFM**	Roll forward model
AER	Australian Energy Regulator	**RIN**	Regulatory Information Notice
CAM	Cost allocation method	**SIB**	Stay-in-business
DWGM	Declared Wholesale Gas Market	**SMS**	Safety Management Studies
EES	Environment Effects Statement	**SOCI**	Security of Critical Infrastructure
EPMO	Enterprise Program Management Office	**SWP**	South West Pipeline
FID	Final Investment Decision	**VGPR**	Victorian Gas Planning Report
GSOO	Gas Statement of Opportunities	**VTS**	Victorian Transmission System
HDD	Horizontal directional drilling	**WACC**	Weighted Average Cost of Capita
IASR	Inputs Assumptions and Scenarios Report	**WOO**	Window of Opportunity
IT	Information Technology	**WOOPS**	Window of Opportunity being Passed
NPV	Net Present Value	**WORM**	Western Outer Ring Main
PKGT	Port Kembla Gas Terminal		