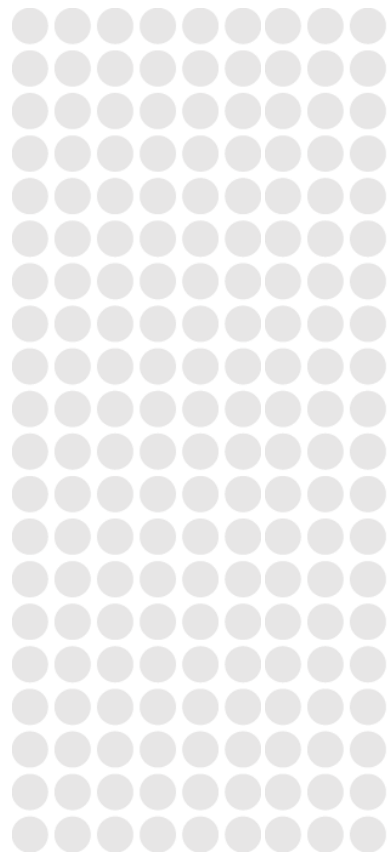




Amadeus Gas Pipeline

2021-26 access arrangement revision proposal overview

1 July 2020



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Foreword

APA owns and operates the Amadeus Gas Pipeline, which plays a major role in energy supply in the Northern Territory. It transports natural gas to Darwin, Alice Springs and regional centres, principally for power generation.

We recently prepared, for Australian Energy Regulator's approval, proposed revisions to the key regulatory document — the Access Arrangement — for the Amadeus Gas Pipeline.

Last year, APA refreshed its corporate purpose. That Purpose is to strengthen communities through responsible energy. This means doing the right thing, even in tough situations. It also means creating value for all our stakeholders; taking a long-term view; investing in future technologies and new energy; and innovating for a sustainable future.

Consistent with that Purpose, we undertook comprehensive community consultation while preparing our Amadeus Gas Pipeline access arrangement revision proposal. By consulting widely with stakeholders, including consumer advocates, pipeline users and prospective users, gas producers, gas retailers, industry and business groups, land owners, and Northern Territory Government agencies, we were able to prepare an access arrangement revision proposal that better reflects the needs and expectations of our stakeholders.

We heard, in our consultation with stakeholders, that energy prices are the number one concern for consumers and businesses in the Northern Territory. Businesses are facing tough conditions, and lower cost energy is seen as important for long term economic development.

Consistent with these concerns, in preparing our access arrangement revision proposal, our priority was on keeping costs down and as efficient as possible, while delivering the safe and reliable operation of the Amadeus Gas Pipeline for gas supply security in the Northern Territory. The prices for gas transportation that we have proposed to the Australian Energy Regulator for 2021–2026 are 45 per cent lower than the current price, with a material part of the reduction attributable to our focus on lowering costs.



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I wish to thank everyone who participated on the Amadeus Gas Pipeline Consumer Reference Group, especially given the challenging circumstances associated with COVID-19. Your contribution was invaluable and has helped shape our plans for the Amadeus Gas Pipeline with a view to delivering better value for all our stakeholders.

Nevenka Codevelle

Group Executive Governance & External Affairs



Proposal highlights

APT Pipelines (NT) Pty Limited (Amadeus) has developed a revision proposal for the Access Arrangement for the Amadeus Gas Pipeline for the next five years (2021-22 to 2025-26). Representatives from across the community contributed to proposal development through the Amadeus Consumer Reference Group.

Until there is greater clarity around the future demand for pipeline services in the Northern Territory, Amadeus cannot develop a well-defined expansion plan for the Amadeus Gas Pipeline. There is no expansion plan to be incorporated in the access arrangement revision proposal.

With capacity for firm transportation service fully contracted to existing pipeline users, the revision proposal sets out terms and conditions for the interruptible service reference service required by the Australian Energy Regulator's reference service proposal decision made in December 2019.

When preparing the access arrangement revision proposal, Amadeus kept forecast capital expenditure and forecast operating expenditure to a minimum, consistent with safe and reliable operation of the Amadeus Gas Pipeline, and with ensuring the security of gas supply in the Northern Territory.

A proposed rate of return on the capital invested in the Amadeus Gas Pipeline has been set in accordance with the Australian Energy Regulator's December 2018 Rate of Return Instrument.

Proposed reference tariffs for the Amadeus Gas Pipeline are shown in the following table.

Proposed AGP reference tariffs 2021-2026

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Firm service	\$/GJ MDQ	0.5740	0.3168	0.3186	0.3195	0.3222	0.3240
Interruptible service	\$/GJ	n.a.	0.3168	0.3186	0.3195	0.3222	0.3240

The firm service and interruptible service reference tariffs are nominally identical. They are, however, substantially different: the interruptible tariff represents a discount of about 28% on the firm service cost per GJ of gas delivered.



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The proposed firm service reference tariff is significantly – 45% – lower than the current (2020-21) tariff.

With capacity for firm transportation service fully contracted to existing pipeline users, the firm service reference tariff should enable users and prospective users to understand the pricing of a firm service reference service, if capacity becomes available for that service.



Abbreviations

AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AGP	Amadeus Gas Pipeline
CAPEX	Capital Expenditure
GJ	Gigajoule
LNG	Liquefied Natural Gas
MDQ	Maximum Daily Quantity
MRP	Market Risk Premium
n.a.	Not available
NGL	National Gas Law
NGR	National Gas Rules
OPEX	Operating Expenditure
PTRM	Post-tax Revenue Model
RFM	Roll Forward Model
RIN	Regulatory Information Notice
TJ/d	Terajoules per day



1 Putting the community at the centre

Amadeus has prepared, and submitted, to the Australian Energy Regulator, proposed revisions to the Access Arrangement for the Amadeus Gas Pipeline. The access arrangement revision proposal was developed in consultation with key stakeholders representing consumers of natural gas and the community. This document describes the consultation process, and summarises the proposal.

1.1 APA community consultation

At APA we are striving to put the community at the centre of our business. We are striving to make the services we offer better for our customers – the users of our pipelines – and better for consumers – the end-users of the gas transported in those pipelines.

To further our goal of making the services we offer better for our customers and better for consumers, we established the Amadeus Consumer Reference Group as a forum in which we could consult the community on our proposed plans for operating and investing in the Amadeus Gas Pipeline (**AGP**) during the next access arrangement period (the period 1 July 2021 to 30 June 2026).

In setting up the Amadeus Consumer Reference Group, we built on the consultation we had conducted earlier when developing the reference service proposal for the AGP, which was submitted to the Australian Energy Regulator (**AER**) in July 2019.

We have sought to use what we learned from consultation in the preparation of our access arrangement revision proposal.

We engaged in a number of different ways with the people who would be impacted by a revised AGP Access Arrangement.

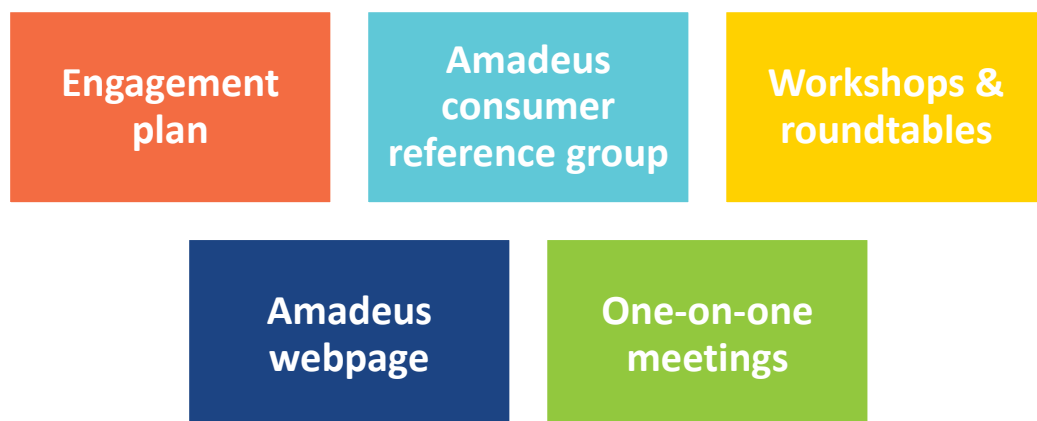
- We prepared a draft engagement plan and asked for feedback on it. The engagement plan can be found at:

<https://www.apa.com.au/about-apa/our-projects/amadeus-gas-pipeline-access-arrangement/>

- We established the Consumer Reference Group, which included representatives from across the community: consumer advocates, pipeline users and prospective users, gas producers, gas retailers, industry and business groups, land owners, and Northern Territory Government agencies. The AER also participated as an observer.
- Between December 2019 and June 2020, we held one workshop and four roundtable meetings with the Amadeus Consumer Reference Group. Information about the workshop and the roundtables is contained in the engagement plan.
- We created an engagement page on the APA website for AGP Access Arrangement revision. All the materials prepared for the workshop and roundtables were placed on the webpage.
- The people and organisations we sought to consult were located in Darwin, Brisbane, Sydney, Melbourne, and Perth. Initially we met in Darwin, but provided on-line access to the meeting. After government-sanctioned travel restrictions were imposed in March 2020, in response to the Covid-19 pandemic, our meetings were on-line. Where people could not attend, we offered one-on-one meetings by telephone.

The key elements of our approach to community consultation on our proposed revisions to the AGP Access Arrangement are summarised in Figure 1.

Figure 1: Key elements of consultation for Amadeus Gas Pipeline





1.2 Consultation principles

Our meetings with the Amadeus Consumer Reference Group were guided by the following principles:

- **No surprises.** We wanted to reveal as much as possible about our plans ahead of making our proposal to the regulator. We wanted consumers and the regulator to feel that during the engagement process we had revealed the details of our thinking.
- **Clear, accurate and timely communication.** We aimed to prepare information with sufficient time for consideration and feedback. We held a workshop "setting the scene" (the AGP, the regulatory landscape, matters on which we were proposing to consult), and four roundtables on access arrangement revision, before submitting our proposal on 1 July 2020.
- **Easy to understand.** We prepared material that was accessible and not too technical so it could be understood by a wide audience. We have made this information available on our website.
- **Transparent.** We aimed to be transparent about our thinking and plans. But, as an ASX-listed company, there are rules about what we can and can't make public. We have existing commercial contracts which are confidential and which we could not talk about.
- **Consumer influence.** We sought to be open about what was and wasn't open to consumer influence. For example, our operating and capital expenditure plans are open to influence, however, rates of return are essentially set in a statutory (binding) instrument and were presented for information only.
- **Measureable.** We sought feedback on the consultation process, and asked for an assessment against the above principles. A survey was sent after the fourth roundtable to seek this feedback.

Ultimately, when developing the Access Arrangement revision proposal, we wanted to have an open and honest dialogue with the Amadeus community.

1.3 Workshop and roundtable meetings

Table 1 summarises the issues we discussed with the Amadeus Consumer Reference Group.



Table 1: Meetings with AGP Consumer Reference Group

Workshop/roundtable	Timing	Topics
Roundtable 1: Setting the scene	10 December 2019	<ul style="list-style-type: none"> • Introduction to APA and the Amadeus Gas Pipeline • The regulatory landscape • Matters on which we were proposing to consult • Engagement plan and feedback
Roundtable 2: Getting to the detail	27 February 2020	<p>Our initial thinking on key issues:</p> <ul style="list-style-type: none"> • Forecast of demand for pipeline services • Amadeus asset management plan and planned capital expenditure • Forecasting of operating expenditure • Applying the rate of return instrument <p>Our responses to issues raised in Roundtable 1</p>
Roundtables 3a and 3b: More on revenue and pricing	20 April 2020; 4 June 2020	<p>Two short roundtable meetings held on-line because of COVID-19 restrictions in place at the time</p> <p>Roundtable meeting 3a:</p> <ul style="list-style-type: none"> • Further explanation of demand forecast • Specification of an interruptible service reference service • Roll forward of the capital base • Total revenue determination using the AER's Post-tax Revenue Model <p>Roundtable meeting 3b:</p> <ul style="list-style-type: none"> • Cost allocation • Reference determination • Other access arrangement issues: reference tariff variation, queuing capacity trading, and extension and expansion requirements <p>Our responses to issues raised in Roundtable 2</p>
Roundtable 4: How you shaped our thinking	11 June 2020	<p>What we learned, and how we incorporated it into our proposal</p> <p>Open discussion</p>



1.4 What we heard and how we responded

During meetings with the Amadeus Consumer Reference Group, we presented our thinking and sought feedback from the Group. We wanted the consultation to be both informative and participative.

Our intention was to make sure that the Reference Group understood the regulatory framework as well as our proposals for revision of the AGP Access Arrangement.

We sought to incorporate the insights and feedback from the Reference Group into the Access Arrangement revision proposal.

Key areas in which we were influenced included:

- energy affordability: the main concern of end-users of gas, and of commercial and residential end-users of electricity (gas is the principal fuel for power generation in the Northern Territory).
- the design of the interruptible reference service.

A number of broader issues were raised by the Amadeus Consumer Reference Group. They included the role of the AGP in the longer term economic development of the Northern Territory, and the need for expanded pipeline capacity.

What we heard, and our responses, are summarised in Table 2.



Table 2: What we heard during consultation and our response

Topic	Issue raised	Our response
Energy prices and affordability	<p>Energy prices were the number one concern for businesses and electricity consumers in the Northern Territory.</p> <p>The level of economic activity had declined, and businesses were facing tough conditions.</p> <p>Consumers and businesses wanted to see energy delivered more cheaply.</p> <p>Lower cost energy was seen as important for long term economic development.</p>	<p>We acknowledged that energy prices were a major concern.</p> <p>APA Asset Management Policy, applied to Amadeus, is focused on balancing asset performance, risk and cost.</p> <p>Capital expenditures are forecast to be the minimum consistent with safety, reliability and the security of gas supplies.</p> <p>Operating expenditure has been forecast from a low base year, and is subject to an efficiency incentives scheme.</p>
Agreement between Amadeus and PWC	<p>A pre-existing gas transportation agreement between Amadeus and Power Water Corporation seems to preclude others from accessing pipeline capacity.</p> <p>We were asked about the relationship between Amadeus and PWC in so far as it affected the rights of other (second priority) firm and interruptible users on the AGP.</p> <p>PWC responded that existing capacity is fully contracted, but PWC has never had a problem with others seeking AGP expansion.</p> <p>Amadeus was asked whether other (non-foundation) users will end up with transportation agreements very different from the PWC agreement. There was concern about the confidential</p>	<p>Amadeus has a gas transportation agreement with PWC; PWC is a foundation customer using the AGP. Like other commercially negotiated agreements, this transportation agreement is confidential.</p> <p>Other transportation agreements are also in place which are confidential.</p> <p>The AER has access to all pre-existing transportation agreements.</p> <p>These pre-existing agreements fully contract the capacity in the AGP available for provision of the firm transportation service; no capacity is available for the firm service reference service.</p> <p>If other users require the firm service reference service, the capacity of the pipeline will have to be expanded.</p> <p>Certain provisions in the pre-existing agreements gave the holders prior</p>



	<p>nature of the pre-existing agreements, and about a lack of transparency.</p>	<p>rights to expanded pipeline capacity, even if expansion were financed by another party. Amadeus recognised this issue, and was addressing it: pre-existing agreements are to be amended to limit the right of holders of those agreements to the existing capacity available for the provision of firm transportation service.</p>
Capacity of AGP	<p>Lack of available firm capacity for gas transportation in the AGP was a concern.</p> <p>New projects needed to be able to get cost effective gas in the Northern Territory; this required access to pipeline capacity.</p> <p>What was the longer term view: what role would Amadeus play in growing the Northern Territory in 20-30 years?</p> <p>The AER advised that reasonable certainty was required about an expansion before it could be included in an access arrangement revision proposal, and its costs recovered through reference tariffs.</p>	<p>Amadeus's core business is the provision of pipeline transportation service. We are open to opportunities to expand the capacity of the AGP to provide additional firm service.</p> <p>We are aware that there is interest in additional capacity, but that interest had not yet "firmed" into the negotiation of gas transportation agreements which would underpin pipeline expansion.</p> <p>In the absence of clear indications of additional capacity requirements and timings, we could not develop and cost an expansion proposal for inclusion in the AGP Access Arrangement revision proposal.</p>
Capacity utilisation	<p>The issue was raised about a lack of market signals to inform pipeline expansion. The question was asked as to whether there are periods of time where the AGP is unutilised and capacity could be made available.</p> <p>More information should be available on the utilisation of the pipeline.</p>	<p>Short-term prices could not signal the need for long term pipeline expansion.</p> <p>The firm service reference tariff was intended to signal the cost of additional capacity in the AGP.</p> <p>Information on AGP use was on the Gas Bulletin Board.</p> <p>Although the capacity for firm transportation service was fully contracted, capacity was available for interruptible service, especially on</p>



		the southern section of the AGP, allowing gas deliveries to Warrego.
Services	The interruptible service in APA's current standard gas transportation agreement would be a good starting point for the design of an interruptible service reference service.	<p>Following the decision by the AER that an interruptible service reference service was to be included in the AGP Access Arrangement, we asked the Reference Group what users were seeking in an interruptible service.</p> <p>We redrafted the Access Arrangement to incorporate an interruptible service reference service based on the interruptible service of the APA standard gas transportation agreement, and provided the drafting to the Reference Group.</p>
Forecast capital expenditure	<p>The capital expenditure we proposed for the Access Arrangement period seemed reasonable, but further scrutiny should be given to the largest single "line item", motor vehicles.</p> <p>We were asked about the asset lives used for calculating the regulatory asset base.</p>	<p>Amadeus motor vehicle replacements were in accordance with APA vehicle replacement policy. The policy is has been designed to deliver a vehicle fleet of high standard to ensure the safety of personnel driving long distances, often in remote locations, and to effect cost efficient vehicle replacement when required.</p> <p>The asset lives we used in calculating depreciation were lives commonly used for transmission pipeline assets, and had not been changed from those adopted at previous access arrangement revisions.</p>
Forecast operating expenditure	<p>What were the differences between operating expenditure and capital expenditure; could expenditure be treated as operating rather than capital expenditure?</p> <p>What was the lifespan of the AGP, and what happens when</p>	<p>We explained the difference between operating expenditure and capital expenditure in terms of the latter creating new assets which would provide services over an extended period.</p> <p>We explained that the AGP was near "mid-life", and was in good condition.</p>



	<p>maintenance or repairs are conducted? Are replacement sections of the pipe provided so as not to interrupt flow? Are the maintenance operations contracted out?"</p>	<p>Capital expenditure was required to replace minor items of equipment which were either at the ends of their lives, or obsolete and unable to be maintained.</p> <p>Amadeus does not shut down the AGP for maintenance and repairs. This work is done on the operating pipeline. Sometimes the pressure, and hence the capacity to provide service, must be reduced for a short period to allow maintenance to be safely carried out.</p> <p>Amadeus may employ contractors for particular tasks, but does not "contract out" the maintenance and repair of the AGP.</p>
<p>Community benefit</p>	<p>We were asked "What's in it for the Northern Territory community?"</p>	<p>Maintenance and repair are responsibilities of engineering and technical staff located in Palmerston.</p> <p>As forecast for the AGP Access Arrangement revision proposal, these activities are relatively small scale, and are not expected to significantly impact the community.</p> <p>Expansion of the AGP would involve major investment which could have flow-on effects in the Northern Territory. Expansion was likely to be preceded by land-owner and community consultation, and environmental review. It could provide training and employment opportunities depending on the scale and type of work to be carried out.</p>



2 The Amadeus Gas Pipeline

The Amadeus Gas Pipeline is a transmission pipeline extending approximately 1,600 kilometres from gas fields in the Amadeus Basin, in central Australia, to Darwin. It is a fully regulated pipeline under the access regulatory regime of the National Gas Law and the National Gas Rules. The pipeline service provider is APT Pipelines (NT) Pty Limited (ACN 075 733 336).

2.1 About the Amadeus Gas Pipeline

The AGP is a transmission pipeline extending approximately 1,600 kilometres from gas fields in the Amadeus Basin, in central Australia, to Darwin (see Figure 2). It transports natural gas to Darwin, Alice Springs and regional centres, principally to fuel electricity generation.

Gas is delivered into the AGP at Palm Valley and Mereenie, and from the Bonaparte Gas Pipeline, at Ban Ban Springs (see Figure 2). Gas can be delivered into the AGP, from the Wickham Point Pipeline, at Darwin City Gate.¹

Construction of the AGP was completed in 1986. Nine locations along the pipeline were developed as sites for future compressor stations, which could provide additional capacity if the demand for pipeline services were to increase. The first, and currently the only, AGP compressor station was constructed at Warrego in 1995.

Interconnection, in January 2019, allows gas to flow from the AGP into the Northern Gas Pipeline, and into Queensland and the east coast pipeline network. About half of the gas which flowed in the AGP during 2019 was delivered into the Northern Gas Pipeline.

¹ The Wickham Point Pipeline (not part of the AGP) was constructed to supply gas, in an emergency, from an LNG plant at Wickham Point, to the Weddell Point Power Station.

Amadeus Gas Pipeline
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Figure 2: Amadeus Gas Pipeline



2.2 Covered (regulated) pipeline

The Gas Pipelines Access (Northern Territory) Act 1998 implemented the access regulatory regime of the Gas Pipelines Access Law and the National Third Party Access Code for Natural Gas Pipeline Systems in the Northern Territory. The pipeline system specified in pipeline licences PL 4 and PL 18



issued under Part III of the Energy Pipelines Act 1981 (NT) – the AGP – was listed, in Schedule A, as a pipeline covered from commencement of the Code.

In July 2008, the National Gas (Northern Territory) Act 2008 came into effect, replacing the scheme of access regulation of the Code with the scheme of the National Gas Law (**NGL**) and the National Gas rules (**NGR**). A transmission pipeline that was covered under the Code was deemed, by clause 6 of Schedule 3 to the NGL, to be a covered pipeline on commencement of the NGL.

The AGP, a covered pipeline under the Code, is now a covered pipeline under the access regime of the NGL and the NGR.

PL 4 is the licence for the main high pressure pipeline extending from the outlet flange of the Palm Valley delivery station to the delivery flange at the Channel Island Power Station near Darwin.

The pipeline system licensed as PL 4 includes:

- the Mereenie Pipeline, which extends from a delivery flange at the Mereenie production facility to the AGP main line at Tyler's Pass (west of Alice Springs)
- the Tennant Creek Pipeline, which extends from an outlet flange on the main line to a delivery flange at the Tennant Creek Power Station
- the Katherine Pipeline, which extends from an outlet flange on the AGP main line to a delivery flange at the Katherine Power Station.

PL 18 is the licence for a short extension from the Darwin City Gate (part of the pipeline system licensed as PL 4) to a pressure reduction facility located at the corner of Wishart Road and Berrimah Road. Gas from the pressure reduction facility flows into the Darwin distribution network.

Neither the Bonaparte Gas Pipeline, nor any of the other lateral pipelines extending from the AGP (see Table 3), are a part of the pipeline system licensed as PL 4. Neither the Bonaparte Gas Pipeline, nor any of the laterals, is a part of the covered pipeline.



Table 3: Lateral pipelines extending from, but not part of, the AGP

Lateral pipeline	
Tanami Lateral	
Elliott Pipeline	
McArthur River Pipeline	
Mataranka Lateral	Low pressure plastic pipeline
Mt Todd Pipeline	Operation suspended

2.3 AGP Access Arrangement and service provider

For the purposes of the access regulatory regime of the NGL and the NGR, the AGP is a full regulation (covered) pipeline. Under the access regulatory regime, a full regulation pipeline must have an access arrangement, which sets out the way in which prospective users can gain access to pipeline services, and the terms and conditions of service provision, including the prices – tariffs – at which services are to be provided.

An access arrangement for a full regulation pipeline must be periodically revised. For this, proposed revisions must be submitted to the AER, for approval, by a date specified in the current access arrangement.

Proposed revisions to the AGP Access Arrangement were to be submitted to the AER by 1 July 2020. These have now been prepared and submitted by the service provider for the pipeline, APT Pipelines (NT) Pty Limited (ACN 075 733 336) (**Amadeus**).

Amadeus is a wholly owned entity within APA Group.

The AGP Access Arrangement revision proposal, which Amadeus submitted to the AER, comprises three documents:

- *Proposed Revised Access Arrangement for the Amadeus Gas Pipeline 1 July 2021 to 30 June 2026, 1 July 2020*
- *Proposed Revised Access Arrangement for the Amadeus Gas Pipeline 1 July 2021 to 30 June 2026 (changes tracked), 1 July 2020*

- *Proposed Revised Access Arrangement Information for the Amadeus Gas Pipeline, 1 July 2020*

On 1 April 2020, the AER issued a Regulatory Information Notice (**Reset RIN**) to Amadeus under Division 4 of Part 1 of Chapter 2 of NGL. The Reset RIN requires that Amadeus provide, to the AER, certain information and material used for the purpose of preparing the AGP Access Arrangement revision proposal.

The AER required that specified information be provided in the form of completed regulatory templates (Microsoft Excel workbooks), which were provided with the Reset RIN. Four completed templates were required:

- Amadeus 2022-26 - Reset RIN - Workbook 1 - Forecast.xlsm
- Amadeus 2022-26 - Reset RIN - Workbook 2 - Historical.xlsm
- Amadeus 2022-26 - Reset RIN - Workbook 3 - ECM.xlsm
- Amadeus 2022-26 - Reset RIN - Workbook 4 - Annual.xlsm

As required in the Reset RIN as varied, Workbooks 1-3 were submitted on 15 July 2020. Workbook 4 will be submitted, as required, in November 2020.

All of the other information and material which Amadeus was to provide to the AER, was provided in the document *Amadeus Gas Pipeline Reset RIN response, 1 July 2020 (Reset RIN response)*, and in attachments to that document.

Two key attachments to the Reset RIN response were the Microsoft Excel spreadsheet models:

- Amadeus_Attachment 2_Gas transmission RFM_1-Jul-2020-public
- Amadeus_Attachment 3_Gas transmission PTRM_1-Jul-2020.

These were, respectively, the gas transmission service provider versions of the Roll Forward Model (**RFM**) and the Post-tax Revenue Model (**PTRM**), which the AER issued in April 2020. Each had been populated, without modification, with data for the AGP.

The proposed revisions to the AGP Access Arrangement provide for price regulation as required by the NGR, and address all of the other matters for which the NGR require provision be made in a full access arrangement.



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The following three sections of this document summarise the Access Arrangement revision proposal. These sections are:

- Pipeline services and demand
- Total revenue and pricing
- Access Arrangement changes and amendments.



3 Pipeline services and demand

An interruptible service reference service has been added to the AGP Access Arrangement. This should allow the transportation of gas, particularly from southern producers to Warrego and the Northern Gas Pipeline, at a time when capacity for the firm service reference service of the Access Arrangement is fully contracted under pre-existing agreements.

3.1 Pipeline services

An access arrangement revision proposal for a full regulation pipeline must:

- describe all of the pipeline services that the service provider can reasonably provide using the pipeline
- specify the reference services to be offered by the service provider, in a way consistent with a prior reference service proposal decision made by the AER.

3.1.1 Pipeline services that can reasonably be provided

Amadeus can reasonably provide, using the AGP, the pipeline services listed in Table 4.

The demand for pipeline transportation service is driven by the business needs of the end users of the gas transported. End users requiring highly reliable gas supplies for power generation, for industrial process heat, or as a process feedstock, require a correspondingly reliable gas transportation service. Transmission pipelines are therefore built to provide users with firm transportation service.

Firm transportation service is the most reliable service a service provider can make available using its pipeline. Should the interruption or curtailment of pipeline services be necessary, firm transportation service has priority ahead of other types of transportation service and other services using pipeline capacity.

The provision of other pipeline services is ancillary to the provision of firm transportation service.



Table 4: Services that can reasonably be provided using the AGP

Service	Description
Firm transportation service	<ul style="list-style-type: none"> - Transportation from a receipt point to a delivery point - Highest priority service - Available between any receipt point and any delivery point
Interruptible transportation service	<ul style="list-style-type: none"> - Transportation from a receipt point to a delivery point - Lower priority service (may not be available on a day) - Available between any receipt point and any delivery point
Firm parking service	<ul style="list-style-type: none"> - Pipeline storage of gas - Highest priority right to store
Firm loan service	<ul style="list-style-type: none"> - Borrowing of gas from pipeline line pack - Highest priority right to borrow
Interruptible parking service	<ul style="list-style-type: none"> - Pipeline storage of gas - Lower priority service (may not be available on a day)
Interruptible loan service	<ul style="list-style-type: none"> - Borrowing of gas from pipeline line pack - Lower priority service (may not be available on a day)
In-pipe trade service	<ul style="list-style-type: none"> - Facilitation of trade of gas between pipeline user
Operational capacity transfer service	<ul style="list-style-type: none"> - Facilitation of transfer of firm transportation capacity between pipeline users
Interconnection service	<ul style="list-style-type: none"> - Provision, or facilitation, of interconnection to another pipeline

Parking and loan services, for example, are such ancillary services. They use pipeline capacity, either to store gas (parking service) or to provide short term access to a source of gas (loan service), but they are not transportation services. They are services providing users of a pipeline with greater flexibility in the way they use gas transportation services.



A service provider can only offer these parking and loan services when its pipeline has spare capacity.

Several users have previously contracted for parking service on the AGP, but Amadeus now has very limited ability to continue providing them. As discussed below, the AGP is fully contracted for firm transportation service provision. There is no spare pipeline capacity that can be used to provide parking service. Furthermore, high utilisation of the capacity available in a long, narrow diameter, pipeline, essentially without compression, means that Amadeus has little scope for varying the AGP line pack for the purpose of providing loan service.

3.1.2 Reference services

Reference services are the services for which terms and conditions including prices – reference tariffs – are set out in an access arrangement.

The current AGP Access Arrangement sets out terms and conditions, including a price, for a firm transportation service reference service.

The proposed revised Access Arrangement retains the firm service reference service of the current AGP Access Arrangement.

In April 2019, the NGR were amended to require service provider submission of a reference service proposal, to the AER, prior to submission of an access arrangement revision proposal. In response, the AER is to make a reference service proposal decision which can guide the preparation of access arrangement revisions.

After consultation with stakeholders, Amadeus submitted a reference service proposal to the AER in July 2019.

In a reference service proposal decision made in December 2019, the AER said that it was of the view that, since the AGP was fully contracted for firm transportation service provision, any prospective user would have to request an interruptible service if it required gas transportation in the pipeline.

The reference service proposal decision required that Amadeus include, in its access arrangement revision proposal, an interruptible service reference service (in addition to the firm service reference service of the current AGP Access Arrangement).



The proposed revised Access Arrangement includes an interruptible service reference service.

Interruptible service is provided from the un-nominated capacity contracted under pre-existing agreements. It is available to prospective users only if capacity for firm service is not available.

Terms and conditions for the interruptible service reference service have been based on the terms and conditions for interruptible service in the APA standard gas transportation agreement. Alignment of the terms and conditions of the AGP interruptible service reference service with the terms and conditions of the standard gas transportation agreement was proposed by the Amadeus Consumer Reference Group.

To use the interruptible service reference service, a user must have a gas transportation agreement for that service, and must nominate, in accordance with the terms of that agreement, a quantity of gas to be delivered on a day the service is required.

Users of the interruptible service will only pay for nominations that are scheduled and delivered.

The total of the nominations for interruptible service may, on a day, exceed the capacity available for provision of that service.

If the capacity available is not sufficient for all users requesting interruptible service, then Amadeus will allocate the available capacity equitably, on a reasonable basis (such as tariffs paid, first-come-first-served, pro rata based on nominated quantities), among users who have entered into interruptible transportation agreements.

This requirement for equitable allocation of the available capacity is currently in the terms and conditions of Schedule 3 of the Amadeus Access Arrangement, and in APA's standard gas transportation agreement. It recognises both prospective users of the interruptible service reference service, and users with existing transportation agreements for interruptible service on the AGP.

3.2 Demand for pipeline services

The AGP is a transmission pipeline. User demand is principally a demand for pipeline capacity for the provision of firm transportation service. Demand for



the transportation and delivery of volumes of gas derives from users' decisions to use their contracted capacities for the transportation of gas each day.

3.2.1 **Capacity for firm service**

Prior to January 2019, user requirements for capacity in the AGP, and the use of that capacity, were principally for power generation in the Northern Territory. Capacity, for firm transportation service, was used to transport gas north, from receipt points at Palm Valley, Mereenie and Ban Ban Springs, to Darwin, into the Channel Island Power Station, and into the Wickham Point Pipeline for transportation to the Weddell Power Station. These power stations, and smaller stations at Pine Creek and Katherine, supply electricity into the Darwin-Katherine transmission system.

Gas was also delivered from the AGP:

- to small power stations serving remote communities at Elliot and Tennant Creek
- into the Palm Valley to Alice Springs Pipeline for onwards transportation to Alice Springs, where it is used for power generation, and supplied into a small distribution system.

Requirements for capacity and the use of that capacity to transport gas showed some variation with levels of economic activity in the Northern Territory, but were otherwise relatively stable.

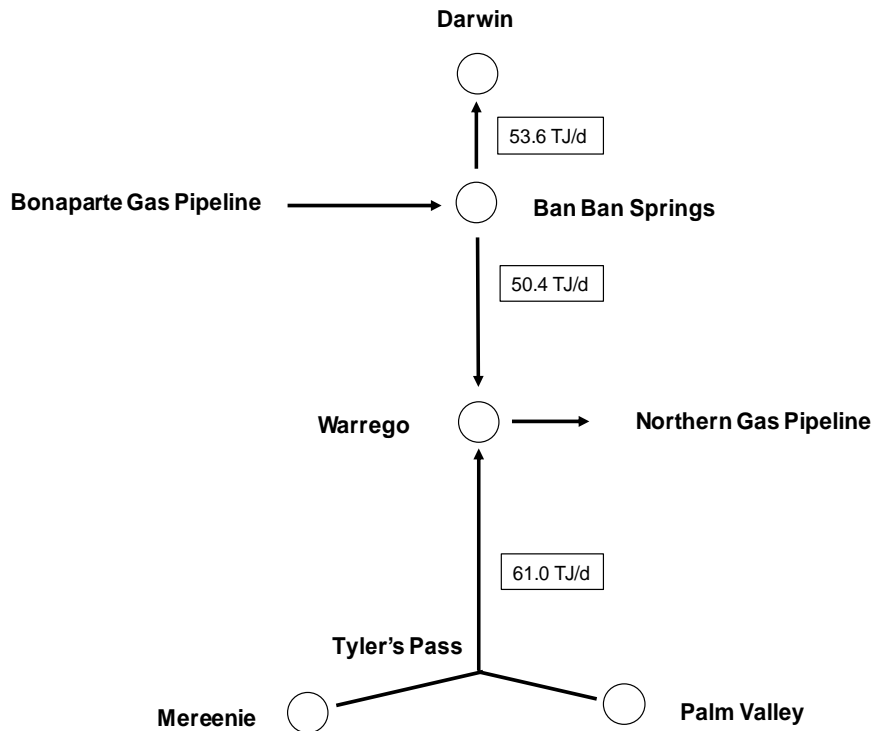
This relative stability in demand changed with interconnection of the Northern Gas Pipeline to the AGP in January 2019.

Gas can now flow from the AGP into the Northern Gas Pipeline, at Warrego, near Tennant Creek, about 1,000 km south of Darwin. Gas delivered into the Northern Gas Pipeline flows into Queensland and, via other pipelines, into the East Coast gas market.

Interconnection with the Northern Gas Pipeline has segmented the capacity of the AGP in the way shown in Figure 3.



Figure 3: AGP gas flows and capacity for firm transportation service after January 2019



The segment capacities shown in Figure 3 have been used to derive the nameplate rating of the AGP.

The nameplate rating of a transmission pipeline is the maximum daily capacity of the facility under normal operating conditions (NGR, rule 141(2)). The nameplate rating of the AGP is its maximum daily capacity to provide firm transportation service under the pipeline's normal operating conditions.

The nameplate rating of the AGP – its capacity to provide firm transportation service under the operating conditions in effect since interconnection with the Northern Gas Pipeline in January 2019 – is 165.0 TJ/d.

Users with pre-existing gas transportation agreements have access to capacities, at receipt points, for firm transportation service, which total 145.0 TJ/d. If those users make maximum use of the capacity available for firm transportation service at the Ban Ban Springs receipt point (104.0 TJ/d), they can use up to a maximum of 50.4 TJ/d to transport gas south, to Warrego. If users with pre-existing agreements use 104.0 TJ/d for transportation from Ban Ban Springs, they have capacity to flow 41.0 TJ/d north, from Palm Valley and



Mereenie. Users with pre-existing agreements can, then, transport, in total, a maximum of 91.4 TJ/d to Warrego, and into the Northern Gas Pipeline.

The AEMO Gas Bulletin Board advises that the nameplate rating of the Northern Gas Pipeline is only 90.0 TJ/d. The capacity of the AGP is, in these circumstances, used to the maximum extent when users with pre-existing agreements have access to capacity of 145.0 TJ/d at AGP receipt points. The segment capacities may total 165.0 TJ/d, but the utilisation of those capacities is constrained by capacity at the delivery point into the Northern Gas Pipeline at Warrego. An aggregate receipt point capacity of 145.0 TJ/d in pre-existing agreements effectively uses all of the capacity available for the provision of firm transportation service in the AGP.

All of the capacity which might otherwise be available for provision of the firm service reference service of the AGP is, then, fully contracted under pre-existing agreements.

No capacity was available for the provision of the firm service reference service during the current access arrangement period.

3.2.2 **Capacity outlook**

No capacity is expected to become available for provision of the firm service reference service during the next access arrangement period.

There is, at the present time, considerable uncertainty around future demand for pipeline services provided using the AGP. There is interest in capacity, primarily for transportation to Warrego and the Northern Gas Pipeline, but those who seem interested are seeking transportation services for relatively short periods (three to five years). Market participants, including Amadeus, are waiting for greater clarity around volumes and timings of potential gas supplies from the undeveloped Beetaloo Basin. At the same time, the increase in gas prices in the East Coast market, seen since 2015, has begun to moderate. There is uncertainty about future prices for delivered gas in the East Coast market, and about whether gas from the Northern Territory can, in the longer term, compete effectively in that market.

Although prospective users and others have expressed interest in additional transportation service in the AGP, their interest has not yet translated into the long term commitments to capacity necessary to support pipeline expansion.

Until there is clarity around future increased demand for firm services, Amadeus cannot develop a well-defined expansion plan for the AGP. Therefore there is no expansion plan to be incorporated in the access arrangement revision proposal, and there is no associated costing for determining proposed reference tariffs.

3.2.3 **Capacity available for an interruptible service reference service**

Interruptible service can be made available using any unused part of the AGP capacity which has been contracted to users with pre-existing agreements. That capacity can be made available to other users subject to recognition of rights, in the pre-existing agreements, for gas to be scheduled ahead of gas scheduled for others.²

The service is interruptible because users with pre-existing agreements have higher priority access to pipeline service. It is not interruptible, as is the case with interruptible services on other pipelines, because plant and equipment must be periodically withdrawn for planned maintenance, or because of unexpected plant and equipment failure.

There may be unused contracted capacity available for provision of an interruptible service in the Ban Ban Springs – Darwin segment of the AGP. However, the only gas flowing into this segment is gas transported in the Bonaparte Gas Pipeline. Amadeus understands that Bonaparte Gas Pipeline capacity to deliver gas into the AGP is currently fully contracted.

Amadeus forecasts no interruptible service in the Ban Ban Springs – Darwin segment of the AGP during the period 2019-20 to 2025-26.

If Bonaparte Gas Pipeline capacity is fully contracted, and if gas from Ban Ban Springs is to be delivered to Warrego using firm transportation service,

² Like other commercially negotiated agreements, these pre-existing agreements are confidential. However, under the NGL, the AER has access to all of Amadeus's agreements for gas transportation using the AGP. The current AGP Access Arrangement (approved by the AER) recognises the existence of the pre-existing transportation agreements explicitly, in the note to section 2.1, in the gas scheduling and curtailment priorities of the terms and conditions applying to firm service (Schedule 3), and in the queuing requirements (section 6.4 of the Access Arrangement).

The note to section 2.1 of the Access Arrangement advises that there is currently no capacity available for provision of the firm service reference service. All of the capacity available for the provision of firm transportation services is utilised under pre-existing transportation agreements.



Amadeus forecasts no interruptible service in the Ban Ban Springs – Warrego segment of the AGP during the access arrangement period.³

Amadeus has forecast that, on average, no capacity is available in the Ban Ban Springs – Darwin and Ban Ban Springs – Warrego segments of the AGP. In making that forecast, Amadeus has used average daily volumes of gas transported. If, on a particular day, the volume of gas to be transported is less than the average volume used by Amadeus, capacity may be available for interruptible service. Whether that capacity can be used for the provision of interruptible service will, of course, depend on whether potential users are able to contract for gas to be delivered at Ban Ban Springs to be transported in the AGP.

The capacity available for firm transportation service between Tyler's Pass and Warrego is 61.0 TJ/d, and that capacity is, as noted above, fully contracted.

During the four months to April 2020, gas deliveries to Warrego using firm transportation service available under pre-existing transportation agreements increased to 22.6 TJ/d.

If the increase in deliveries to Warrego using firm transportation service available under pre-existing transportation agreements is sustained, there is, potentially, some 38.4 TJ/d of capacity available for interruptible service in the Palm Valley, Mereenie – Warrego segment of the AGP.⁴

The capacity potentially available for the provision of interruptible service using the AGP during the period 2020 - 2026 is, then, as shown in Table 5.

³ Use of the maximum capacity is uncertain because it depends on the gas marketing activities of others.

⁴ A small number of users of the AGP have agreements for transportation service which is "second priority firm": the capacity is firm subject to interruption if capacity must be made available to another user with a pre-existing agreement for firm transportation service.

Table 5: AGP capacity available for interruptible service 2020-2026

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Ban Ban Springs - Darwin	TJ/d	0.0	0.0	0.0	0.0	0.0	0.0
Ban Ban Springs - Warrego	TJ/d	0.0	0.0	0.0	0.0	0.0	0.0
Capacity: Tyler's Pass - Warrego	TJ/d	61.0	61.0	61.0	61.0	61.0	61.0
Firm transportation service: Tyler's Pass - Warrego	TJ/d	22.6	22.6	22.6	22.6	22.6	22.6
Palm Valley, Mereenie - Warrego	TJ/d	38.4	38.4	38.4	38.4	38.4	38.4
Capacity available for interruptible service	TJ/d	38.4	38.4	38.4	38.4	38.4	38.4

3.2.4 AGP capacity forecast

For the setting of proposed reference tariffs for the revised AGP Access Arrangement, Amadeus has forecast demand for pipeline capacity for the provision of firm service equal to the maximum transportation capacity of 145 TJ/d available to users with pre-existing gas transportation agreements.

Around 38 TJ/d of capacity is expected to be available for the provision of interruptible service (see Table 5), but the demand for that capacity is uncertain.

Capacity may be available, but the quantity will vary day by day. This variation in the quantity of capacity available for the interruptible service may limit the extent of the demand for that service. Not all potential end-users are likely to be able to adapt their operations to the uncertainty in gas supply brought about by uncertainty in the availability of pipeline transportation.

Amadeus has pre-existing contracts for interruptible service, and understands that at least two market participants are seeking to market gas previously delivered to fertilizer manufacturer, Incitec Pivot, in Brisbane.⁵ However, Amadeus knows little about potential buyers, possible volumes, or terms and conditions of supply. Moreover, one of the market participants may have access to firm transportation capacity. In these circumstances, the volume of interruptible service which is used during the next access arrangement period will be determined by how successful each of a small number of market participants is in marketing gas. The outcome of the "contest" is inherently difficult to forecast.

⁵ Gas transportation to Incitec Pivot terminated in December 2019.



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The volume of interruptible service which might be required by prospective users during the period 2021-2026 is, then, uncertain.

This uncertainty, and the difficulties it creates for reference tariff determination, were noted in the Reference Service Proposal for the AGP which was submitted to the AER on 31 July 2019.

Amadeus does not see the demand for the second-priority firm and interruptible services (both currently available to some users under pre-existing transportation agreements) being in excess of about 15 TJ/d during the access arrangement period.

We put this view on interruptible service to the Amadeus Consumer Reference Group at the Roundtable 3b, and raised it again in Roundtable 4. No member of the Amadeus Consumer Reference Group, which included prospective users of the interruptible service reference service, expressed, either at the roundtables or subsequently, a different view.

For the setting of proposed interruptible service reference tariff, we have forecast demand for the interruptible service to be 15 TJ/d during the period 2021-2026.



4 Total revenue and pricing

Amadeus has set proposed reference tariffs for the AGP. The AER's gas transmission service provider Roll Forward Model and Post-tax Revenue Model have been used, without modification, to roll forward the capital base and calculate the proposed total revenue. The total revenue has been allocated on a per GJ basis between the firm service and the interruptible service reference services.

4.1 Overview

Reference tariffs for an access arrangement are to be calculated from the total of the costs expected to be incurred by an efficient service provider. This total of the costs expected to be incurred is called the building block total revenue. The building blocks of total revenue are:

- return on the capital base
- depreciation
- estimated cost of corporate income tax
- efficiency gains or losses
- forecast operating expenditure.

Amadeus has used the AER's Post-tax Revenue Model (the gas transmission service provider version released in April 2020) to calculate the total revenue.

In this section of the revision proposal overview, we describe our calculation of the total revenue for the period 2021 to 2026, and explain how we have used the total revenue to set proposed reference tariffs for the revised AGP Access Arrangement.

4.2 Roll forward of the capital base

The opening capital base – the initial value of regulatory assets – at the commencement of the access arrangement period (1 July 2021) is a key input into total revenue calculation. Amadeus has used the AER's Roll Forward Model (the gas transmission service provider version released in April 2020) to calculate the required opening capital base.



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The AER's Roll Forward Model takes, as its starting point, the opening capital base approved by the AER in its 2016 Final Decision on the last proposed revisions to the AGP Access Arrangement.

Conforming capital expenditure for the current period is added to the capital base.

If necessary, adjustments may be made for asset disposals, redundant assets and speculative capital brought into the capital base. Amadeus has adjusted AGP capital base for some asset disposals.

Regulatory depreciation, calculated in the model using the AER's indexed straight line method, is then subtracted.

The roll forward of the AGP capital base, from 1 July 2016, is shown in Table 6. The asset value at the end of the last year of the current access arrangement period, \$125.317 million, is the opening capital base for the new access arrangement period.

Table 6: Roll forward of the AGP capital base (nominal)

		2016-17	2017-18	2018-19	2019-20 (est.)	2020-21 (est.)
Opening capital base	\$m	115.817	119.354	119.722	122.574	130.560
Net actual/estimated CAPEX	\$m	5.337	1.902	4.724	9.934	4.374
Regulatory depreciation	\$m	-1.800	-1.534	-1.872	-1.947	-4.905
Adjustments	\$m					-4.713
End of year asset value	\$m	119.354	119.722	122.574	130.560	125.317

The AER's Roll Forward Model also "rolls forward" the tax asset base using the calculation of tax depreciation made within the model.

Amadeus has not amended the AER's Roll Forward Model when rolling forward the AGP base to 1 July 2021, and has not amended the roll forward of the tax asset base.

At Roundtable 3a, we explained our use of the Roll Forward Model to the Amadeus Consumer Reference Group and asked if there were any questions on our proposed "roll forward" of the capital base. The Reference Group seemed satisfied with our proposed approach to capital base roll forward.

4.3 Forecast capital expenditure

The reference tariffs of an access arrangement are to recover the costs of providing the reference services, including the costs of the service provider's investment in the pipeline system used to provide those services.

A substantial part of the capital base comprises investment which has been made in the past. This investment is the opening capital base for the next access arrangement period, which is the end of year asset value from the last year of the Roll Forward Model.

Forward projection of the capital base over the next access arrangement period requires a forecast of capital expenditure.

Forecast capital expenditure for the AGP, during the period 2021-26, comprises the planned costs of asset renewal and of upgrading some existing assets.

The need for asset renewal and upgrading, and the costs expected to be incurred, are outputs from Amadeus's asset management planning.

Forecast capital expenditure for the next access arrangement period is summarised in Table 7. The expenditure forecast in the table is a forecast made at constant, June 2021, prices. It is the forecast in real terms required as an input to the AER's Post-tax Revenue Model.

Table 7: AGP forecast capital expenditure 2021-26 (real, Jun-2021)

		2021-22	2022-23	2023-24	2024-25	2025-26
Pipelines	\$m	0.429	0.429	0.374	0.409	0.258
Compressors	\$m	0.000	0.000	0.000	0.000	0.000
Meter Station	\$m	0.809	0.838	1.220	0.956	0.842
SCADA	\$m	0.000	0.000	0.000	0.000	0.000
O&M Facilities	\$m	1.000	0.606	0.666	0.964	1.252
Buildings	\$m	0.000	0.000	0.000	0.000	0.000
Corporate Assets (IT Software)	\$m	0.000	0.000	0.000	0.000	0.000
Land and Easement	\$m	0.000	0.000	0.000	0.000	0.000
CAPEX forecast	\$m	2.238	1.873	2.260	2.330	2.352

4.3.1 AGP asset management planning

Asset management plans are the outworking of well-established processes which APA has for each of its major pipeline assets.



Development of these processes has been guided by ISO 55000 (the International Standard covering management of physical assets).

Asset management planning focuses on systematic and coordinated activities to optimally and sustainably manage assets over their life cycles for the purpose of achieving organisational objectives.

Amadeus's asset management plan for the AGP sets out activities to optimally and sustainably manage the pipeline at the current stage of its life. This asset management plan has been provided to the AER as an attachment to the Reset RIN response.

The AGP will be some 35 years old at commencement of the next access arrangement period. The pipe itself is generally in sound condition, but there has been some degradation consistent with a pipeline which is about half-way through its physical life.

After 35 years in service, some components require replacement either because they have reached the ends of their physical lives, or because they are obsolete and can no longer be maintained.

Action is required in two broad areas:

- pipeline integrity and corrosion management
- end of life replacement of equipment, and replacement due to obsolescence (particularly of electronic equipment).

Amadeus is forecasting relatively low capital expenditure in these two broad areas during the next access arrangement period: around \$2 million each year.

We are of view that this forecast of capital expenditure is consistent with a pipeline 35 years old and generally in sound condition.

Amadeus Consumer Reference Group participants at Roundtable 2 generally agreed, but asked for the justification of planned expenditure of around \$0.3 million a year on motor vehicle replacement.

We explained that the expenditure was not discretionary, but was in accordance with specific APA corporate policy for vehicle replacement. The intention of the policy is the maintenance of a vehicle fleet of high standard to ensure the safety of personnel driving long distances, often in remote locations, and to effect cost efficient vehicle replacement when required.



4.4 Depreciation, projected capital base and return

Through the inclusion of regulatory depreciation in the total revenue, a pipeline service provider is given the opportunity to recover its investment in assets used to provide pipeline services. Inclusion in the total revenue of a return on the projected capital base compensates the service provider for the opportunity cost of the capital invested but not yet recovered.

The projected capital base, on which this return can be earned, is determined in a way similar to the roll forward of the capital base during the current access arrangement period:

- forecast conforming capital expenditure is added to the opening capital base (which, for the first year of the new access arrangement period, is from the Roll Forward Model)
- if necessary, adjustments are made for asset disposals, redundant assets and speculative capital brought into the capital base
- regulatory depreciation, calculated (in the Post-tax Revenue Model) using the AER's indexed straight line method, is subtracted.

Amadeus's forward projection of the AGP capital base for the period 2021-22 to 2025-26 is summarised in Table 8. The calculations summarised in the table have been made using the gas transmission service provider version of the AER's Post-tax Revenue Model. They are in nominal ("dollars of the day") terms; they are not at constant prices (real terms) like the capital expenditure forecast in Table 7 above.

Table 8: Projected capital base and return on capital base (nominal)

		2021-22	2022-23	2023-24	2024-25	2025-26
Projected capital base	\$m	125.317	126.276	126.694	127.390	128.018
Net capital expenditure	\$m	2.318	1.987	2.454	2.590	2.677
Regulatory depreciation	\$m	-1.359	-1.569	-1.758	-1.962	-2.204
Adjustments	\$m					
End of year asset value	\$m	126.276	126.694	127.390	128.018	128.491
Rate of return		4.79%	4.79%	4.79%	4.79%	4.79%
Return on capital base	\$m	6.005	6.051	6.071	6.105	6.135

The return on the projected capital base shown in Table 8 is the product of:

- the projected capital base – the forecast total investment in the pipeline – at the beginning of the year
- the allowed rate of return.

The way in which we have estimated the allowed rate of return (4.79%) is explained in the paragraphs which follow.

4.5 Rate of return

In Roundtable 2, we explained to the Amadeus Consumer Reference Group how we had arrived at an estimate of 4.79% for the rate of return. The estimate was made in the way required by the current rate of return instrument. It was a weighted average of a rate of return on equity and a rate of return on debt. The weighting assigned to the rate of return on debt – the gearing - was the proportion of debt in the total (debt plus equity) capital of an efficient service provider.

The rate of return instrument, and an explanatory statement, are available from:

<https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-instrument-2018>

We explained that the rate of return would be updated by the AER during its revision proposal approval process. This updating would capture recent movements in the risk free rate of return and the cost of debt.

We asked the Reference Group for its views on our application of the rate of return instrument. The Reference Group did not comment.

The following paragraphs summarise Amadeus's estimation of the rate of return for the AGP revision proposal.

4.5.1 Risk free rate of return

A risk free rate of return is required for estimating equity returns. Returns on low-risk government bonds are used to estimate this risk free rate of return.

The way in which the risk free rate is to be estimated, from returns on Australian Government securities with terms to maturity of 10 years, is set out in the rate of return instrument.

APA's estimate of the risk free rate of return, made using returns on Australian Government securities over the period of 20 trading days to 31 December 2019, is 1.21%.

4.5.2 **Rate of return on equity**

In accordance with the rate of return instrument, the return on equity is estimated using the Capital Asset Pricing Model:

$$k^e = k^f + \beta \times \text{MRP}$$

k^f is the estimate of the risk free rate of return.

$\beta \times \text{MRP}$ is a premium for risk:

- MRP is the market risk premium – the amount by which the expected market rate of return on all assets exceeds the risk free rate of return
- β is a measure of the way in which the expected return on a pipeline equity investment co-varies with the expected market rate of return on all assets

In the rate of return instrument:

- MRP is set to an effective annual rate of 6.1%
- β is set at 0.6.

Amadeus's estimate of the expected rate of return on equity is, then:

$$k^e = k^f + \beta \times \text{MRP} = 1.21\% + 0.6 \times 6.1\% = 4.87\%$$

4.5.3 **Rate or return on debt**

The rate of return instrument requires estimation of the rate of return on debt as an average of the rates on corporate debt with a term to maturity of 10 years published by:

- Reserve Bank of Australia
- Bloomberg
- Thompson-Reuters.

Amadeus has used data from these three sources for the 20 trading days to 31 December 2019, and the formulae of the rate of return instrument, to estimate a return on debt for the AGP.



Amadeus's estimate of the rate of return on debt, made in the way required, is 4.75%.

4.5.4 **Estimate of the allowed rate of return**

Using its estimates of the return on equity and the return on debt, together with the value for the gearing set in the rate of return instrument (0.6), Amadeus has made an estimate of the allowed rate of return of:

$$(1 - 0.6) \times 4.87\% + 0.6 \times 4.75\% = 4.79\%$$

Amadeus has used this estimate – 4.79% – as the rate of return when determining the total revenue and reference tariffs of its proposed revisions to the AGP Access Arrangement.

4.6 **Forecasting inflation**

The allowed rate of return calculated in the way prescribed by the rate of return instrument is a nominal rate. It incorporates – implicitly – expectations of future inflation. Those expectations must be made explicit for some parts of the total revenue and reference tariff calculations required for access arrangement revision.

A guideline, published by the AER in December 2017 sets out a preferred way of forecasting inflation.

APA has used the method of the AER's guideline to forecast inflation for the AGP Access Arrangement revision proposal.

Our forecast of inflation is 2.39%.

We have made this forecast using the inflation forecasts from the *Statement of Monetary Policy* issued, by the Reserve Bank of Australia in May 2020.

Our application of the AER's inflation forecasting guideline was explained to Amadeus Consumer Reference Group at Roundtable 2, and no comment was made.

4.7 **Forecast operating expenditure**

Forecast operating expenditure is the major building block of AGP total revenue.

NGR rule 91 requires that operating expenditure be the expenditure incurred by a prudent service provider acting efficiently, in accordance with accepted

good industry practice, to achieve the lowest sustainable cost of delivering pipeline services.

Two broad approaches have been taken to forecasting operating expenditure for access arrangement revision. These are:

- top down - an established forecasting rule is applied
- bottom up – all activities planned during the access arrangement period are identified and costed.

A bottom up approach has the advantages of being comprehensive and accommodating of significant changes in activities and the costs of those activities.

A top down approach can be relatively simple to apply, and can be designed to deliver a forecast of the efficient costs of sustainable operation. The top down “base, step and trend” method is now commonly used in forecasting operating costs for access arrangement revision, and has been accepted by the AER.

Amadeus has proposed forecasting operating expenditure for the AGP, over the next access arrangement period, using the base, step and trend method.

In applying the base, step and trend method, Amadeus has:

- selected as the base year 2017-18: actual operating expenditure in this year was low, and can be assumed to provide a “revealed efficient” level of recurrent expenditure
- removed from the base year costs:
 - costs which are non-recurrent which must be separately forecast (including corporate costs)
 - lease payments made for right-of-use leases
- trended the recurrent base year costs forward across the next access arrangement period (2021-2026), applying a series of indices to reflect expected increases in costs
- used the following indices when trending the recurrent base year costs:
 - output growth: 0.00%; no output growth is forecast during the next access arrangement period

- real labour price change: approximately 0.40%
- productivity change: 0.50%, as allowed by the AER in recent regulatory decisions
- adjusted for step changes: we have added an estimate of \$0.120 million a year (\$, Jun-2021) for ongoing costs incurred in auditing work required for completion of annual regulatory information notices
- separately forecast:
 - inline inspection costs
 - excavation costs (zero for the next access arrangement period)
 - corporate costs (\$1.519 million (real, Jun-2021), based on corporate costs attributable to the AGP during the current access arrangement period.

From 1 July 2019, Amadeus has applied Australian accounting standard AASB 16, Leases, in respect of leases of right-of-use assets, and has reported the capitalised value of the future lease payments as a liability in respect of which depreciation and interest on the liability are reported annually. The lease payments incurred and recognised as an operating cost in the base year, 2017-18, were removed from the base year costs. The capitalised value of the lease payments has been recognised as an asset in the Amadeus PTRM, for which financing costs are incurred and depreciation is allowed, and no lease payments have been included in the forecast of operating expenditure for the period 2021-2026.

Our forecast of total operating expenditure includes a forecast of debt raising costs. This forecast of debt raising costs is the forecast calculated by the AER's Post-tax Revenue Model.

Amadeus's forecast of operating expenditure is summarised in Table 9. The forecast required as an input into the Post-tax Revenue Model – the forecast shown in Table 9 – is a forecast at constant, June 2021, prices. It is escalated, and expressed in nominal terms, in the model.

Table 9: AGP operating expenditure forecast 2021-26 (\$m, Jun-2021)

		2021-22	2022-23	2023-24	2024-25	2025-26
Trended base year OPEX	\$m	7.565	7.547	7.534	7.521	7.508
Separately forecast costs						
Inline inspection (pigging) costs	\$m	0.205	0.358	0.358	0.102	0.113
Excavation costs	\$m	0.000	0.000	0.000	0.000	0.000
Step changes						
Annual RIN audit costs	\$m	0.120	0.120	0.120	0.120	0.120
Controllable OPEX	\$m	7.889	8.025	8.012	7.743	7.741
Corporate costs	\$m	1.638	1.638	1.638	1.638	1.638
Debt raising costs	\$m	0.061	0.060	0.059	0.058	0.057
Forecast OPEX	\$m	9.588	9.723	9.709	9.439	9.435

With a mechanism in place to provide incentives for efficiency, use of the base, step and trend method can deliver a forecast which is likely to be the expenditure which would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services. Such an incentive mechanism is in place in the AGP Access Arrangement.

4.8 Efficiency gains and losses

Section 8 of the AGP Access Arrangement sets out an efficiency carryover mechanism. The efficiency carryover mechanism is an incentive mechanism designed to encourage Amadeus to seek efficiencies in the operation of the AGP.

If actual costs can be kept below the costs forecast for an access arrangement period, without impairing operation of the AGP, Amadeus can carry forward an incremental efficiency gain which adds to total revenue in the next access arrangement period.

Conversely, if actual costs are above the costs forecast for an access arrangement period, Amadeus must carry forward an incremental efficiency loss which reduces total revenue in the next access arrangement period.

The prospect of these incremental gains and losses provides the incentive for Amadeus to keep its operating costs down.

We explained the efficiency carryover mechanism to the Amadeus Consumer Reference Group during Roundtable 2. The mechanism, which had been approved by the AER in 2016, was a relatively simple example of the incentive mechanisms now used by economic regulators, and the Reference Group did not comment on it.

4.9 Estimated cost of corporate income tax

An estimate of the cost of corporate income tax, adjusted for the value of imputation credits available to certain classes of equity investors, is to be included in the total revenue.

In 2019, the AER reviewed its approach to estimating the cost of tax, and incorporated the findings of its review into the tax calculations of the gas transmission service provider Post-tax Revenue Model.

Amadeus has relied on the Post-tax Revenue Model for calculations of the estimated cost of corporate income tax, and the adjustment for the value of imputation credits, when calculating the total revenue for revision of the AGP Access Arrangement.

This was explained to the Amadeus Consumer Reference Group.

4.10 Total revenue

The building blocks of total revenue are, as we noted at the beginning of this section 4:

- return on the capital base
- depreciation
- estimated cost of corporate income tax
- efficiency gains or losses
- forecast operating expenditure.

They are the estimated costs of providing the reference services of the AGP Access Arrangement. Each has been discussed, albeit briefly, in preceding sections of this document.

Total revenue for the AGP, for the period 2021-22 to 2025-26, is summarised in Table 10.

Table 10: AGP total revenue 2021-22 to 2025-26 (nominal)

		2021-22	2022-23	2023-24	2024-25	2025-26
Return on capital base	\$m	6.005	6.051	6.071	6.105	6.135
Regulatory depreciation	\$m	1.359	1.569	1.758	1.962	2.204
Cost of corporate income tax	\$m	0.000	0.000	0.000	0.000	0.000
Efficiency gains and losses	\$m	1.322	1.979	-0.699	0.256	0.000
Forecast operating expenditure	\$m	9.817	10.192	10.421	10.373	10.616
Total revenue	\$m	18.504	19.792	17.551	18.696	18.955
Smoothed total revenue	\$m	18.504	18.607	18.711	18.815	18.920
X factor		19.67%	1.79%	1.79%	1.79%	1.79%

Table 10 also shows the smoothed total revenue (which has present value equal to the present value of the total revenue), and the X factors which effect the smoothing. The smoothed total revenue and the X factors are calculated within the Post-tax Revenue Model.

4.11 Allocating total revenue between services

Each of the reference services of an access arrangement must have a reference tariff. The NGR guide tariff setting.

NGR rule 93 requires the allocation of the total revenue between reference and other services in the ratio in which costs are allocated between reference and other services.

Rule 95 further requires that a tariff for a transmission pipeline reference service be designed to generate from the provision of each reference service the portion of total revenue referable to that reference service.

The portion of total revenue referable to a particular reference service is to be determined as follows:

- costs directly attributable to each reference service are to be allocated to that service
- other costs attributable to reference services are to be allocated between them on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the AER.

With the AGP, there is a difficulty in applying this guidance.



Services provided under pre-existing agreements use all of the capacity available for the provision of firm transportation (and a small amount of the capacity available for interruptible service).

If, as is the case, no capacity is available for the provision of the firm service reference service, no part of total revenue can be allocated to that service, and no reference can be determined.

To enable users and prospective users to understand the pricing of a firm service reference service, should capacity become available for that service, a firm service reference tariff has previously been calculated for the AGP Access Arrangement by making the assumption that all of the capacity used to provide the firm transportation services of pre-existing agreements is capacity which would otherwise have been used for the firm service reference service.

We propose continuing this approach to setting a firm service reference tariff in the revised AGP Access Arrangement.

We propose allocating total revenue between the maximum quantity of firm transportation service under pre-existing agreements, and the forecast of the volume of interruptible service which might be expected during the next access arrangement period.

As noted in section 3.2.4 above:

- users with pre-existing agreements for firm transportation service have maximum transportation capacity of 145 TJ/d under these agreements.
- we do not expect the demand for interruptible services to exceed 15 TJ/d during the next access arrangement period.

We have used these quantities to allocate the total revenue between the firm service and the interruptible service for the purpose of setting proposed reference tariffs for those services (see Table 12 below). All of the total revenue has been attributed to the provision of the reference services. All costs are attributable to the reference services, but no cost is directly attributable to either the firm service or the interruptible service individually.

Costs are allocated in a way which provides Amadeus with a reasonable opportunity to recover at least the efficient costs expected to be incurred in providing the firm service and interruptible service reference services.

Providing Amadeus with a reasonable opportunity to recover at least its efficient costs provides effective incentives for:

- efficient investment in the AGP (the pipeline used to provide the provides reference services)
- the efficient provision of pipeline services.

4.12 Tariff structure

Amadeus is proposing to retain, in the revised AGP Access Arrangement, the existing structure of the firm service tariff. The tariff is a number of \$/GJ of contracted capacity for transportation between any receipt point and any delivery point on the AGP.

A simple price per GJ MDQ has been retained because the costs of providing the firm service are the fixed costs of investment in the pipeline, and operating and maintenance costs which do not vary with the volume of gas transported. These costs are appropriately allocated to users on the basis of the capacities they contract for firm service provision.

We are proposing a similar simple structure for the reference tariff for the interruptible service reference service. The interruptible tariff is a number of \$/GJ for the volume of gas transported between any receipt point and any delivery point on the pipeline.

A simple price per GJ is proposed because the costs of providing the interruptible service are the fixed costs of investment in the pipeline, and operating and maintenance costs which do not vary with the volume of gas transported. These costs are appropriately allocated to users on the basis of the volume of interruptible service they use.

4.13 Reference tariffs

Amadeus proposes a commonly used method for the setting of reference tariffs for the firm and interruptible reference services.

The proposed reference tariffs for the AGP are shown in Table 11. Table 11 also shows the varied reference tariff for 2020-21, which was approved by the AER on 5 June 2020.



Table 11: Proposed AGP reference tariffs 2021-2026

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Firm service	\$/GJ MDQ	0.5740	0.3168	0.3186	0.3195	0.3222	0.3240
Interruptible service	\$/GJ	n.a.	0.3168	0.3186	0.3195	0.3222	0.3240

The firm service and interruptible service reference tariffs are nominally identical.

They are, however, substantially different: at the firm service load factor for the Amadeus Gas Pipeline (about 72%), the interruptible tariff represents a discount of about 28% on the firm service cost per GJ of gas delivered.

The proposed firm service reference tariff is significantly – 45% – lower than the current (2020-21) tariff. The principal reasons for this are:

- lower total revenue for the period 2021-22 to 2025-26: a consequence of a lower return on the capital base (in turn, a consequence of higher current period depreciation and a lower rate of return), and lower forecast operating expenditure
- allocation of a part of the lower total revenue to the provision of the interruptible service reference service
- higher firm service capacity: 145 TJ/d, as compared with approximately 105 TJ/d in the (2016) tariff calculation for the current AGP Access Arrangement.

Reference tariff calculation proceeds as follows:

- smoothed total revenue (from the Post-tax Revenue Model) is allocated between the firm service reference service and the interruptible service reference on the basis of the demand forecast
- the existing firm service tariff structure (\$/GJ MDQ, postage stamp) is retained
- a postage stamp tariff is adopted for interruptible service, but in the form \$/GJ of gas delivered
- the firm service reference tariff in the first year of the access arrangement period is the portion of smoothed total revenue divided by the total firm service capacity (145 TJ/d): the tariff is \$0.3168/GJ MDQ

- over the access arrangement period, the firm service tariff follows a CPI - X price path: the assumed CPI increase is 2.39%, the X factors are 1.79% as calculated by the Post-tax Revenue Model, and the tariff in the final year of the access arrangement period is forecast to be \$0.3240/GJ MDQ
- the interruptible service reference tariff in the first year of the access arrangement period is the portion of smoothed total revenue allocated to interruptible service, divided by the average quantity of interruptible service (15 TJ/d): the tariff is \$0.3168/GJ
- over the access arrangement period, the interruptible tariff follows a CPI - X price path: the assumed CPI increase is 2.39%, the X factors are 1.79% as calculated by the Post-tax Revenue Model, and the tariff in the final year of the access arrangement period is forecast to be \$0.3240/GJ
- forecast revenue from these firm service and interruptible service reference tariffs, over the access arrangement period, has a total present value of \$81.436 million (discounted at the proposed allowed rate of return of 4.79%); this is the present value of total revenue in the Post-tax Revenue Model, and confirms the internal consistency of the tariff calculations.

These calculation for AGP reference tariff setting are summarised in Table 12.

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Table 12: AGP reference tariff setting 2021-2026

		2021-22	2022-23	2023-24	2024-25	2025-26	
		365	365	366	365	365	
Forecast							
Firm service	TJ/d	145.00	145.00	145.00	145.00	145.00	
Interruptible service	TJ/d	15.00	15.00	15.00	15.00	15.00	
		<hr/>					
		160.00	160.00	160.00	160.00	160.00	
Firm service	GJ	52,925,000	52,925,000	53,070,000	52,925,000	52,925,000	
Interruptible service	GJ	5,475,000	5,475,000	5,490,000	5,475,000	5,475,000	
		<hr/>					
		58,400,000	58,400,000	58,560,000	58,400,000	58,400,000	
Input from Post-tax Revenue Model							
Smoothed total revenue	\$m	18.504	18.607	18.711	18.815	18.920	
p0, X factors		p0	X02	X03	X04	X05	
		19.67%	1.79%	1.79%	1.79%	1.79%	
Inflation forecast		2.39%	2.39%	2.39%	2.39%	2.39%	
Rate of return	4.79%						
Reference tariff calculation							
Allocation of (smoothed) total revenue to reference services							
Firm service	\$m	16.769	16.862	16.957	17.051	17.147	
Interruptible service	\$m	1.735	1.744	1.754	1.764	1.774	
		<hr/>					
		\$m	18.504	18.607	18.711	18.815	18.920
Reference tariff: firm service							
Total revenue allocated to firm	\$m	16.769	16.862	16.957	17.051	17.147	
Firm service	GJ MDQ	52,925,000	52,925,000	53,070,000	52,925,000	52,925,000	
Tariff: firm service	\$/GJ MDQ	0.3168	0.3186	0.3195	0.3222	0.3240	
Reference tariff: interruptible service							
Total revenue allocated to interruptible	\$m	1.7347	1.7444	1.7541	1.7639	1.7738	
Interruptible service	GJ	5,475,000	5,475,000	5,490,000	5,475,000	5,475,000	
Tariff: interruptible service	\$/GJ	0.3168	0.3186	0.3195	0.3222	0.3240	
Forecast revenue							
Firm service	\$m	16.769	16.862	16.957	17.051	17.147	
Interruptible service	\$m	1.735	1.744	1.754	1.764	1.774	
		<hr/>					
		\$m	18.504	18.607	18.711	18.815	18.920
PV(Firm service forecast revenue)	\$m	73.801					
PV(Interruptible service forecast revenue)	\$m	7.635					
PV(forecast revenue)	\$m	81.436					
PV(smoothed total revenue) (from PTRM)	\$m	81.436					
PV difference	\$m	0.000					

As shown in the last rows of Table 12:

- when discounted at the proposed rate of return (4.79%), the forecast revenue from firm service has a present value of \$73.801 million, and the forecast revenue from interruptible service has a present value of \$7.635 million; the forecast revenue from reference services has a present value of \$81.436 million
- this present value (\$81.436 million) is the present value of the total revenue (total cost of providing the services) from the Post-tax Revenue Model.

As required by the NGR, costs have been allocated, and reference tariffs set, in a way which provides Amadeus with a reasonable opportunity to recover at least the efficient costs expected to be incurred in providing reference services.



5 Access Arrangement changes and amendments

An interruptible service reference service has been included in the proposed revised AGP Access Arrangement. Other changes which Amadeus has proposed to the Access Arrangement are of relatively minor scope. They update the reference tariffs and the reference tariff variation mechanism, and align the provisions of the Access Arrangement with amendments made to the NGR in 2019.

5.1 Overview

In the two preceding sections of this document we focused on the demand for, and pricing of, the reference services of the revised AGP Access Arrangement.

We also referred to proposed changes to be made to the Access Arrangement to include the interruptible service reference service required by the AER's December 2019 reference service proposal decision for the AGP. We prepared, and provided to the Amadeus Consumer Reference Group, the drafting for these changes. They were the major changes required to the AGP Access Arrangement.

Other changes which must be made when revising the Access Arrangement are of relatively minor scope. We have

- listed the services which Amadeus may provide using the AGP
- amended the access request process
- updated, but not changed the form of, the reference tariff variation mechanism
- made the changes to the extension and expansion requirements required by rule changes which came into effect in April 2019.

These amendments and changes to the AGP Access Arrangement are briefly noted in the paragraphs which follow.



5.2 Services which may be provided

NGR, rule 48(1)(a) now requires that an access arrangement describe all of the pipeline services that the service provider can reasonably provide on its pipeline. Furthermore, the description must be consistent with the description of services in the AER's prior reference service proposal decision for the pipeline.

Amadeus has provided this description of services in its proposed revised access arrangement.

5.3 Amended access request process

Amendments to NGR rule 112, made since the last revision of the AGP Access Arrangement, have introduced new steps and new timelines into the access request process.

Amadeus has incorporated these new steps and new timelines into its proposed revised access arrangement.

5.4 Reference tariff variation mechanism

The reference tariff variation mechanism in the AGP Access Arrangement allows annual variation of the reference tariff for:

- current inflation
- a change in the rate of return on debt (as required by the Rate of Return Instrument)
- a material increase in costs attributable to one or more of a small number of specified events (including regulatory change, tax change, terrorism and natural disaster)

In our access arrangement revision proposal, we propose retaining this mechanism, and using it to vary, annually, both the firm service reference tariff and the interruptible service reference tariff.

The only changes we have proposed to the reference tariff variation mechanism:

- extend its application to the interruptible service reference service
- update its various formulae so that they can be applied during the next access arrangement period.



We presented information on the reference tariff variation mechanism to the Amadeus Consumer Reference Group, but the group did not comment.

5.5 Extension and expansion requirements

Extension and expansion requirements, which were in accordance with NGR rule 104, are set out in section 7 of the AGP Access Arrangement.

In April 2019, rule 104 was amended to require, among other things, that an applicable access arrangement state that the access arrangement applies to incremental services provided by any expansion of the pipeline during the access arrangement period. The option for a service provider to propose, to the AER, that the access arrangement not apply to those incremental services has been removed.

We have amended section 7 of the Access Arrangement so that it accords with the current requirements of rule 104.

No questions were raised about the amendments when we discussed them with the Amadeus Consumer Reference Group.