



**DRAFT DECISION**  
**Amadeus Gas Pipeline**  
**Access Arrangement**  
**2016 to 2021**

**Attachment 13 – Demand**

November 2015

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## Note

This attachment forms part of the AER's draft decision on the access arrangement for the Amadeus Gas Pipeline for 2016–21. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 - Services covered by the access arrangement

Attachment 2 - Capital base

Attachment 3 - Rate of return

Attachment 4 - Value of imputation credits

Attachment 5 - Regulatory depreciation

Attachment 6 - Capital expenditure

Attachment 7 - Operating expenditure

Attachment 8 - Corporate income tax

Attachment 9 - Efficiency carryover mechanism

Attachment 10 - Reference tariff setting

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Attachment 13 - Demand

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## Shortened forms

Shortened form	Extended form
AA	Access Arrangement
AAI	Access Arrangement Information
AER	Australian Energy Regulator
AGP	Amadeus Gas Pipeline
ATO	Australian Tax Office
capex	capital expenditure
CAPM	capital asset pricing model
CESS	Capital Expenditure Sharing Scheme
CPI	consumer price index
DRP	debt risk premium
EBSS	Efficiency Benefit Sharing Scheme
ERP	equity risk premium
Expenditure Guideline	Expenditure Forecast Assessment Guideline
gamma	Value of Imputation Credits
GSL	Guaranteed Service Level
MRP	market risk premium
NEGI	north eastern gas interconnector
NGL	national gas law
NGO	national gas objective
NGR	national gas rules
NPV	net present value
opex	operating expenditure
PFP	partial factor productivity
PPI	partial performance indicators
PTRM	post-tax revenue model
RBA	Reserve Bank of Australia
RFM	roll forward model
RIN	regulatory information notice
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model

Shortened form	Extended form
TAB	Tax asset base
UAFG	Unaccounted for gas
WACC	weighted average cost of capital
WPI	Wage Price Index

## 13 Demand

This attachment sets out the AER's assessment of the demand forecasts proposed by APTNT for its Northern Territory gas transmission network (Amadeus Gas Pipeline) for the 2016–21 access arrangement period. Demand is an important input into the derivation of APTNT's proposed reference tariff.

### 13.1 Draft decision

We are satisfied that APTNT's proposed demand forecasts comply with rule 74(2) of the National Gas Rules (NGR).

The reasons for our decision are discussed below.

### 13.2 APTNT's proposal

APTNT prepared its own demand forecasts based on:<sup>1</sup>

- historic trends in gas volumes and maximum demand for each delivery point; and
- the relevant drivers for expected gas demand for each delivery point.

APTNT submitted that forecast total gas demand (GJ) is expected to grow by approximately 1.7 per cent per annum over the access arrangement period.<sup>2</sup> APTNT submitted that this forecast has been derived by developing a bottom up forecast for each delivery point, taking into account the unique characteristics of each delivery point that drive demand. APTNT further submitted that this combined forecast was then checked against available demand information from the user.<sup>3</sup>

### 13.3 Assessment approach

The NGR require access arrangement information for a full access arrangement proposal for a transmission pipeline to include:

- usage of the pipeline over the earlier access arrangement period showing minimum, maximum and average demand for each receipt and delivery point; and user numbers for each receipt and delivery point<sup>4</sup>
- to the extent that it is practicable to forecast pipeline capacity and utilisation of pipeline capacity over the access arrangement period, a forecast of pipeline capacity and utilisation of pipeline capacity over that period and the basis on which the forecast has been derived.<sup>5</sup>

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<sup>1</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 48.

<sup>2</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 50.

<sup>3</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 50.

<sup>4</sup> NGR, r. 72(1)(a)(iii).

<sup>5</sup> NGR, r. 72(1)(d).

The NGR also require that forecasts and estimates:<sup>6</sup>

- are arrived at on a reasonable basis
- represent the best forecast or estimate possible in the circumstances.

We consider that there are two important considerations in assessing whether demand forecasts are arrived at on a reasonable basis and whether they represent the best forecasts possible in the circumstances.<sup>7</sup> These are:

- the appropriateness of the forecast methodology – this involves consideration of how the demand forecast has been developed; and
- whether or not relevant factors have been taken into account in developing the demand forecasts.

To determine whether APTNT's proposed demand forecasts are arrived at on a reasonable basis and are the best possible forecasts in the circumstances, we reviewed the data inputs used to implement the forecasting methodology.

In making our draft decision, we relied on:

- information provided by APTNT as part of its proposed access arrangement; and
- information provided in response to the regulatory information notice (RIN).

### 13.3.1 Interrelationships

Tariff prices depend on estimates on forecast total demand (GJ/day). Changes in these forecasts will translate into changed tariff prices. In simple terms, tariff prices are determined by cost divided by total demand (GJ/day), such that an increase in forecast demand has the effect of reducing the tariff price and vice versa.

The demand forecasts also affect capital and operating expenditure linked to increased network capacity. However, APTNT has not proposed to increase the capacity of the network during the access arrangement period.

AGL and Santos raised concerns regarding proposals to connect the Amadeus Gas Pipeline (AGP) to the east coast gas market. In particular, AGL raised concerns that gas flows on the AGP are likely to increase with the connection of the North East Gas Interconnector (NEGI) such that the initial tariffs set out in the access arrangement are likely to overcharge users on the AGP<sup>8</sup>. Jemena also submitted that the NEGI would increase demand on the AGP and suggested that this additional demand should be accounted for in the demand forecasts or other regulatory mechanism should be

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<sup>6</sup> NGR, r. 74(2).

<sup>7</sup> NGR, r. 74(2).

<sup>8</sup> AGL, *Submission on Amadeus Gas Pipeline, Access Arrangement Revision Proposal*, 2 September 2015, p. 2; Santos, *Submission on Amadeus Gas Pipeline, Access Arrangement Revision Proposal*, 2 September 2015, p. 1.



considered to address this issue (e.g. pass through provisions, the form of control or the length of the access arrangement period).<sup>9</sup>

We recognise that the connection of the NEGI to the AGP may impact on future demand on the AGP. We also agree with APNTNT that there is not sufficient information to reliably forecast the impact of the NEGI on the demand forecasts, given the degree of uncertainty as to the implications of the NEGI for the AGP. We do, however, consider there is merit in providing for a further review of the access arrangement when the implications of the NEGI for services provided on the AGP are more certain. Our draft decision therefore requires a trigger for acceleration of the review submission date, which will allow APTNT, stakeholders and us to consider the implications of the NEGI for the access arrangement as a whole. This is discussed in attachment 12.

## 13.4 Reasons for draft decision

We are satisfied that APTNT's forecasting methodology and the assumptions applied are arrived at on a reasonable basis. We also propose to accept APTNT's demand forecasts and forecast for capacity utilisation are arrived at on a reasonable basis. As such we consider that APTNT's demand forecasts represent the best estimate possible in the circumstances.<sup>10</sup>

A summary of our reasons is below.

### 13.4.1 Forecast methodology and assumptions

We consider that the demand forecast methodology and assumptions adopted by APTNT were arrived at on a reasonable basis in accordance with the NGR for the following reasons:<sup>11</sup>

- the expected average demand for each delivery point is based on an analysis of historic trends in gas volumes and key drivers of demand for each delivery point
- analysis of the maximum demand at each delivery point has taken into account observed historical maximums and the nature of demand at each delivery point (e.g. the demand requirements of the user and whether their demand profile is likely to change over the forecast period).
- the bottom up consideration of demand at each delivery point is reasonable as appropriate consideration has then been given to factors that may cause the future demand growth rate at each delivery point to differ from observed trends.

Further, we note that in relation to total demand (GJ volume), APTNT's actual demand is expected to be closely aligned with forecast demand in the current access

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<sup>9</sup> Jemena, *Submission on Amadeus Gas Pipeline, Access Arrangement Revision Proposal*, 31 August 2015, p. 1.

<sup>10</sup> NGR, r. 74(2).

<sup>11</sup> NGR rr. 74(1), 74(2)(a).

arrangement period, which supports the reliability of APTNT's forecast methodology and assumptions.<sup>12</sup>

### 13.4.2 Minimum, maximum and average demand

Under the NGR, APTNT's access arrangement information (AAI) must include minimum, maximum and average demand for each receipt or delivery point for the earlier access arrangement.<sup>13</sup> We consider that the information contained within the AAI satisfies the requirement of rule 72(1)(a)(iii)(A) of the NGR.<sup>14</sup> We also consider that the inclusion of user numbers for each receipt or delivery point as shown in the access arrangement information satisfy the requirement of rule 72(1)(a)(iii)(B) of the NGR.<sup>15</sup>

### 13.4.3 Forecast pipeline capacity and utilisation

Rule 72(1)(d) of the NGR requires that, to the extent it is practicable to forecast pipeline capacity over the access arrangement period, the access arrangement information should include forecast pipeline capacity and utilisation of pipeline capacity over the access arrangement period. We consider the information contained within the AAI satisfies the requirement of rule 72(1)(d) of the NGR. We have formed this view on the basis that:<sup>16</sup>

- the capacity forecast has taken into account aggregated contracted demand on the pipeline taking into account and any additional capacity that can be delivered within the physical and contractual constraints of the pipeline; and
- utilisation is based on forecast average delivery volumes and the capacity of the pipeline and uses estimates of non-coincident demand based on recent data, where annual growth in non-coincident demand is reasonably assumed to match forecast volume growth.

### 13.4.4 Demand forecasts

#### Total demand (GJ volumes)

In aggregate APTNT has forecast total volumes (GJ) to grow by around 1.8 per cent per annum over the 2016–21 access arrangement period.<sup>17</sup> This compares to 2 per

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<sup>12</sup> The annual average variation between actual total gas volumes (GJ) and forecast is estimated to be within one per cent over the 2011–16 access arrangement period.

<sup>13</sup> NGR, r. 72(1)(a)(iii)(A).

<sup>14</sup> APA Group, *2016–21 Access Arrangement Information*, August 2015, pp. 4-6.

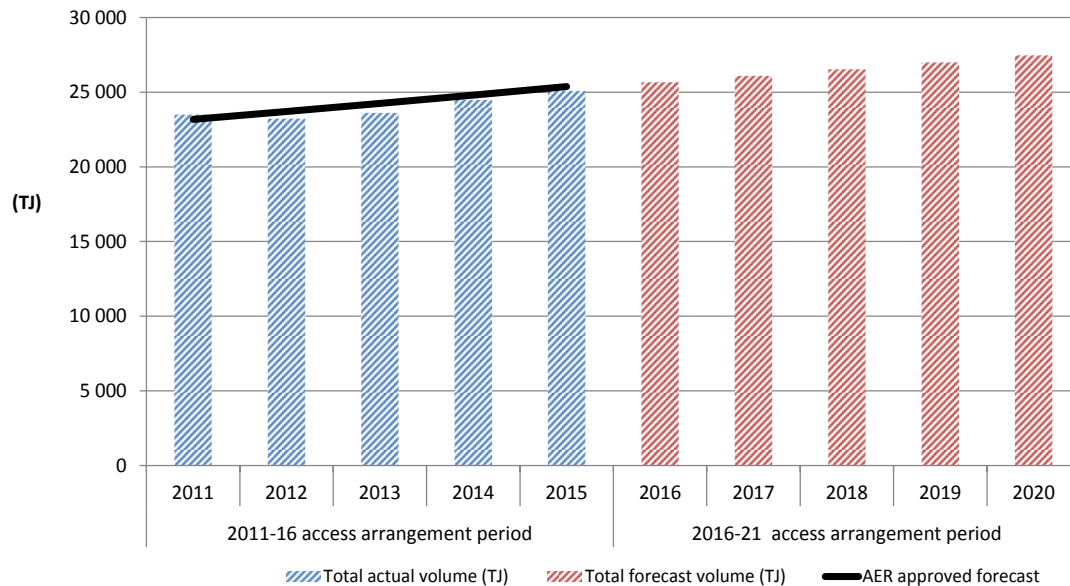
<sup>15</sup> APA Group, *2016–21 Access Arrangement Information*, August 2015, p. 7.

<sup>16</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, pp. 48-49.

<sup>17</sup> This calculation was derived from APA Group, *Regulatory Information Notice response*, August 2015, template 12-Demand.

cent per annum, estimated over the 2011–16 access arrangement period.<sup>18</sup> Figure 13.1 shows actual/estimated volumes compared to the forecast.

**Figure 13.1 Actual/estimated and forecast total demand (TJ/a)**



Source: APA Group, *Amadeus Gas Pipeline, Response to Regulatory Information Notice, template 12 - demand*, August 2015.

In assessing APTNT’s proposed total gas volume forecasts (TJ), we have considered APTNT’s forecasts at each delivery point on the pipeline and compared these with historic volumes at each delivery point. In undertaking this assessment we recognise that given the nature of the end use of the gas at each delivery point, the actual and forecast volume growth differs between each delivery point. We also note that in some instances actual gas delivered at each delivery point has varied significantly from year to year as the end use of gas can be volatile (for example, where end use is for electricity generation peaking load).

We have focused on the Channel Island, Weddell and Alice Springs delivery points as volumes at these locations constitute around 78 per cent of the total volume forecast (TJ).<sup>19</sup> These delivery points supply gas for local electricity generation for domestic, commercial and industrial end users.<sup>20</sup> As stated by APTNT the usage of gas related to electricity generation is likely to follow trends in projections of electricity usage that are affected by electricity demand drivers such as:<sup>21</sup>

<sup>18</sup> This calculation includes an estimate for total gas volumes in 2015–16.

<sup>19</sup> This calculation is based on actual 2014–15 data in the AAI.

<sup>20</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, pp. 46–47.

<sup>21</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 46.

- appliance use and efficiency; and
- population growth.

APTNT’s slightly lower forecast annual growth rate for total volume (TJ) for the AGP over the 2016–21 access arrangement period is consistent with:

- The increased use of more efficient electricity generation units at the Weddell delivery point and the displacement of some electricity generation base load at the Channel Island delivery point.
- The expected continuation of relatively stable demand at the Channel Island delivery point from the replacement of older electricity generation units at the Channel Island delivery point with more effective units.
- An initial reduction in the usage forecast at the Alice Springs delivery point below historical demand to reflect a change in gas supply arrangements with the development of an alternative gas source.
- Expected lower usage from slower population growth and economic growth in the Northern Territory compared to the 2011–16 arrangement period as set out in Table 13.1.

**Table 13.1 NT Gross State Product and population growth (% change)**

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
GSP	4.2	4.3	6.5	4.5	4.5	4.5	3.0	3.0	3.0	3.0
Population	1.9	2.0	1.7	1.7	1.7	1.7	1.7	1.7	n/a	n/a

Source: [www.budget.nt.gov.au](http://www.budget.nt.gov.au); [www.treasury.nt.gov.au/Economy/population projections/Pages/default.aspx](http://www.treasury.nt.gov.au/Economy/population%20projections/Pages/default.aspx)

Note: (n/a) not available.

On the basis that the evidence outlined above suggests that growth in aggregate total gas volumes will be lower over the 2016–21 access arrangement period, we consider that the total demand forecasts have been arrived at on a reasonable basis and represent the best possible forecast in the circumstances.

### Maximum demand (GJ/day)

APTNT submitted (as summarised in Table 13.2 ) that it has adopted a number of approaches to forecast maximum demand depending on the nature of demand at each deliver point as follows:

**Table 13.2 Maximum daily demand forecasting approach by delivery point**

Delivery point	Forecasting approach
Tennant Creek, Pine Creek and Elliot	APTNT has forecast maximum daily demand in line with gas requirements to fuel the maximum output of electricity generators installed at these sites.
Townend Road	APTNT has forecast maximum daily demand based on plant design and is not expected to grow over the forecast period.
Darwin City Gate	APTNT has forecast maximum daily demand based on historical values without forecast growth, in line with the characteristics of load at this site.
Daly Waters	APTNT has forecast maximum daily demand to reflect the recent expansion at the MacArthur River lead, silver and zinc mine, without further forecast growth over the forecast period.
Pine Creek	APTNT has forecast maximum daily demand based on historical values without forecast growth.
Katherine and Alice Springs	APTNT has forecast maximum daily demand based on historic observed demand growing at the same rate as forecast volumes over the forecast period.
Weddell and Channel Island	APTNT has forecast maximum daily demand at the start of the forecast period based on observed historical maximum daily demands at each delivery point. This demand is then forecast to grow at the same rate as forecast volumes for these delivery points over the forecast period (2.2 per cent per annum).

Source: APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 49.

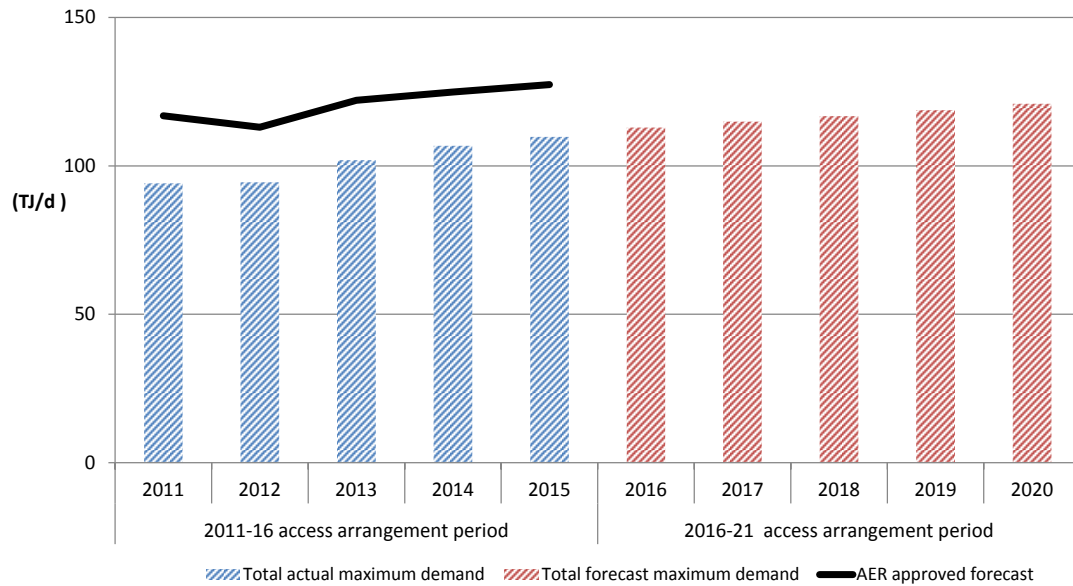
We note that APTNT has taken into account the gas usage characteristics and drivers of demand at each delivery point. We also note as outlined in Table 13.2 that APTNT in forecasting maximum demand has assumed that for some delivery points there is a positive relationship between forecast growth in maximum demand and growth in forecast volumes (average daily demand). A review of past trends indicates that typically there is a positive correlation between maximum demand and volumes as assumed by APTNT. However, a review of past trends indicates that the annual growth in maximum demand and volumes are not necessarily consistent.

To test the reliability of APTNT’s assumption that historical maximum demand will grow at the same rate as forecast annual volumes we have compared past maximum demand annual growth rates with the forecast maximum demand annual growth rates. In aggregate across all delivery points, APTNT has forecast maximum demand to increase by 2 per cent per annum over the 2016–21 access arrangement period. This compares to zero annual average growth estimated over the 2011–16 access arrangement. However, growth in aggregate maximum demand is estimated to be 4 per cent per annum over the 2011–16 access arrangement period if the step decrease in maximum demand between 2010–11 and 2011–12 is excluded.<sup>22</sup> Figure 13.2 shows

<sup>22</sup> These calculations include APTNT’s maximum demand estimate for 2015–16. Note there was a step decrease in maximum demand at the Channel Island delivery point between 2010–11 and 2011–12.

APTNT’s actual/estimated annual maximum demand compared to forecast annual maximum demand.

**Figure 13.2 Actual/estimated and forecast maximum demand (TJ/d)**



Source: APA Group, *Amadeus Gas Pipeline, Response to Regulatory Information Notice, template 12 – demand*, August 2015.

Given the observed volatility associated with short term trends regarding annual growth in maximum demand we have had regard to the long term trend. Overall APTNT’s proposed forecast annual growth in maximum demand is consistent with the long term annual growth of 2.4 per cent per annum for maximum demand. On this basis we consider that the aggregate maximum demand forecasts have been arrived at on a reasonable basis and represent the best forecasts possible in the circumstances.

### 13.4.5 Forecast user numbers

We accept APTNT’s forecast user numbers for the 2016–21 access arrangement period and those forecasts have been arrived at on a reasonable basis. APTNT has submitted that there is no basis for assuming that there will be additional users on the AGP at each delivery point.<sup>23</sup> APTNT submitted that:<sup>24</sup>

- similar to the 2011–16 access arrangement period, the capacity of the AGP is again expected to be fully contracted for the 2016–21 access arrangement period.

<sup>23</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 56.

<sup>24</sup> APA Group, *Amadeus Gas Pipeline, Access Arrangement Revision Proposal, Submission*, August 2015, p. 56.

- there are no identified opportunities for additional supply of gas outside the prevailing firm contract, and therefore no prospects of additional users on the AGP; and
- in the past, users other than the foundation shipper have only contracted for short periods of time associated with the limited availability of firm contracting arrangements and the nature of the users, which are generally short term mining operations.

We accept that as the AGP is expected to be fully contracted for the access arrangement period such that the likelihood of additional users is limited. We recognise that others users in addition to the foundation shipper have contracted for short periods (on a non-firm basis). However, given the expected contractual arrangements, we consider that it is unlikely that there will be additional users demanding significant quantities of gas over the 2016–21 access arrangement period.