Access Arrangement Information

1 July 2014 - 31 December 2019 (AA4)

Submitted to the
Economic Regulation Authority (ERA)

March 2014

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1. Executive summary

1.1 Overview

ATCO Gas Australia submits the fourth revision to the access arrangement for reference services for the Mid-West and South West Gas Distributions Systems (Network). The revised access arrangement covers the period 1 July 2014 to 31 December 2019 (herein referred to as the AA4 period or 'AA4'). This is the first revision to the access arrangement since the Network was acquired by ATCO Group on 29 July 2011.

The next five years is an important period for the development of the domestic gas market in Western Australia. With a rising population and several world-leading liquefied natural gas projects scheduled to commence production in the North West of the state, there is a unique opportunity to harness the potential of this growing market and abundant gas supply by investing appropriately in the Network now and helping customers appreciate and utilise natural gas as a cleaner and more sustainable alternative to coal-fired electricity.

As an experienced operator of regulated utilities, ATCO recognised this opportunity in Western Australia and acquired WA Gas Networks (WAGN). ATCO is a privately-owned international group of companies with approximately $16 billion in assets, employing more than 9,800 people in utilities, structures and logistics, energy and technologies. ATCO Gas (Canada) has supplied gas in Canada since 1912. Its entry into the WA market is part of its long term plan for sustainable growth by developing, building, owning and operating energy infrastructure assets, utilising expertise developed over many years across ATCO's worldwide operations.

ATCO purchased WAGN with the intent to grow the Network and offer Western Australian consumers greater choice and competition in their energy supply. ATCO commenced operating the Network as ATCO Gas Australia on 1 August 2011, mid-way through the current access arrangement period. In its first full year of operations ATCO Gas Australia installed 152 km of additional pipe, connecting 13,500 new customers and offering innovative services such as connection points for co-generation facilities in Perth hospitals.

ATCO Gas Australia's long term strategy is to increase throughput across the Network, encouraging wider use of gas in homes and commercial businesses whilst continuing to support the rapidly-expanding Perth metropolitan area. Despite the progress that has been made since acquiring the Network, this access arrangement review provides the platform for ATCO Gas Australia to fully execute its strategy, investing in and operating the network to deliver long term benefits for customers.

The access arrangement revisions proposed in this submission will enable ATCO Gas Australia to:

- Maintain the safety of customers, the community and its workforce
- Improve reliability and service

- Provide greater access to gas supply for customers
- Set up the business to deliver real price reductions over the longer term

The total investment required to deliver these benefits is $1,059.5 million, comprising $453.8 million in operating expenditure and $605.7 million in capital investment over the five and a half years of AA4.

The proposed amount of revenue recovered through reference tariffs to cover this investment is $1,139.4 million. This includes recovery of capital and a return on investment to cover debt and equity costs of 7.09% and 10.7% respectively. ATCO Gas Australia proposes the tariff increases required to collect the target revenue are similar in each year across the period, resulting in a real average annual tariff increase for customers of 1.6%.

ATCO Gas Australia submits a weighted average cost of capital (WACC) of 8.53%. This will provide a nominal return on investment commensurate with efficient financing costs and the risks involved in operating and investing in the Network to provide reference services. Consistent with the new National Gas Rules' (NGR) requirement to apply a nominal rate of return, ATCO Gas Australia proposes not to inflate its capital base continually, instead adopting transitional arrangements to mitigate short term price impact of the switch to a nominal capital base. ATCO Gas Australia's proposal eliminates the risk of double-counting inflation and results in a lower price path in the long term.

These revisions are discussed further in the following sections.

1.2 Expenditure proposal

ATCO Gas Australia's network investment strategy takes a sustainable approach to maintaining and operating the Network. ATCO Gas Australia's focus is on keeping customers, the public and the workforce safe, improving service and addressing legislative requirements. Aligned with this, ATCO Gas Australia seeks to grow the customer base and consumption in order to reduce unit costs to all customers over time.

ATCO Gas Australia will invest $605.7 million in capital and $453.8 million in operating expenditure. This will provide for a safe and reliable gas distribution network that complies with legal and regulatory requirements. This also includes the costs of marketing activities that will promote greater use of natural gas and increase the number of customer connections, helping create a more competitive WA energy market.

The increase in forecast expenditure (capital investment and operating expenditure) compared to the current access arrangement period (AA3) are driven primarily by the requirements of the Safety Case and the need to lift investment levels to grow the customer base and ensure potential new connections can be accommodated at least cost and without reducing service levels to current customers.

Increases in forecast capital and operating expenditure improve safety, reliability, and access to natural gas for all customers. The increased volumes anticipated in this access arrangement, assisted through marketing efforts, result in a relatively low annual increase in real customer tariffs (1.6 %).

1.2.1 Safety

Safety is driven by the *Gas Standards (Gas Supply and System Safety) Regulations 2000 (WA)*, which requires the production of a Safety Case. The Safety Case documents the process and procedures the network operator must employ to ensure the safe and reliable operation of the Network and must be reviewed and accepted by Energy*Safety.*

ATCO Gas Australia's first Safety Case was accepted by Energy*Safety* in July 2011 and fully implemented in January 2013.[1] It maps out the safety activities the Network operator must conduct to reduce safety risks to as low as reasonably practicable. The Safety Case requirements are factored into ATCO Gas Australia's Asset Management Plan, which identifies specific programmes of work that will reduce asset performance risk to as low as reasonably practicable and ensure assets at the end of their operating life are replaced.

ATCO Gas Australia supports the Safety Case approach as it provides transparency and ensures accountability for safety performance while considering costs, risk and ATCO Gas Australia's other commitments. Executing the activities required in the Safety Case and the Asset Management Plan (AMP) will ensure customers and the public experience a safe gas supply now and in the future.

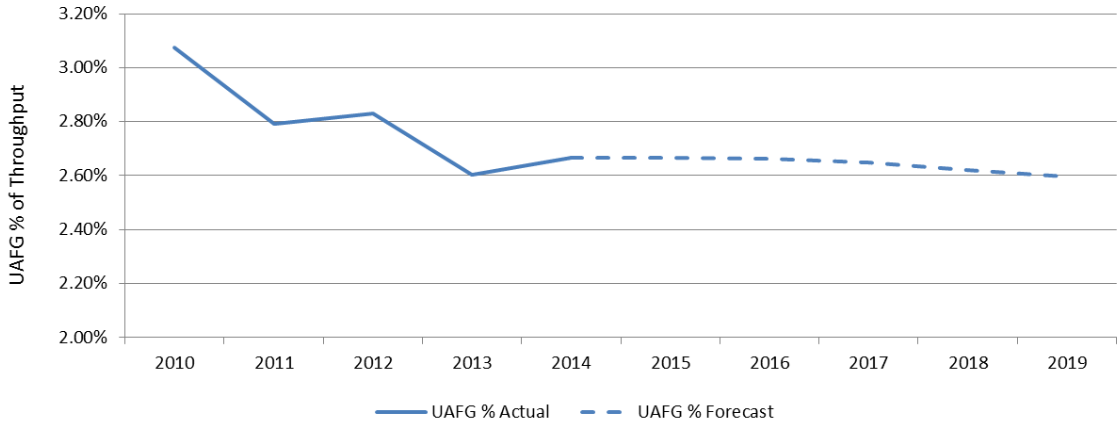
1.2.2 Improving reliability and service

During the AA4 period ATCO Gas Australia will reduce the amount of unaccounted for gas (UAFG) in the Network. UAFG is attributable to measurement error and gas lost to leakage. UAFG costs customers approximately $12 million per annum.

ATCO Gas Australia will invest in leak inspection, pipeline repairs and replacement and will install temperature compensated meters to improve the measurement accuracy and reduce UAFG. In 2014 ATCO Gas Australia will seek to negotiate a new, competitive gas purchase arrangement to replace UAFG. ATCO Gas Australia seeks to pass the variations in these costs through haulage tariffs.

[1] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011

Figure 1: UAFG rate: 2010 to 2019



Addressing UAFG will also help reduce price pressures in the future, contributing to long-term unit cost reductions for all customers.

ATCO Gas Australia will invest $27.4 million of capital and $67.1 million of operating expenditure to replace the aged IT systems and assets inherited when it acquired the Network. Many of these IT systems are no longer fit for purpose and must be upgraded or replaced to allow ATCO Gas Australia to maintain its business support capability and provide service to its 683,000 customers. Further, ATCO Gas Australia expects to add approximately 15,000[2] new customers to the Network during each year of the AA4 period. New retailers have also entered the market, adding to complexity of transactions.

This growth needs robust IT infrastructure and services to support the comprehensive data needs of the business and ensure that the regulatory and market reporting requirements are met. The proposed investment will bring new IT functionality to improve network management and operation, which will support customer growth.

1.2.3 Growth

ATCO Gas Australia will invest $232.5 million of capital expenditure to support growth in the Network and customer base during the AA4 period.

ATCO acquired the Network in 2011 with a view to providing cost-competitive service and harnessing the growth potential in Western Australia. When ATCO Gas Australia reviewed the market in 2011 it became apparent the previous Network owners had undertaken minimal activities to grow the customer base.

Despite average gas consumption per customer declining over the last decade, Western Australia's population and economy has grown and with it the market potential for customer connections, particularly in the residential sector. With a number of large liquefied natural gas projects set to begin domestic supply in the next five years, Western Australia has a

[2] Total new customers less the number of disconnections each year

unique opportunity to maximise its competitive advantage by ensuring infrastructure is in place to deliver this new supply and promote natural gas as a cleaner and more sustainable alternative to coal-fired electricity.

Action should be taken now if Western Australia is to fully capture this opportunity, including being on the ground when new residential and industrial developments occur. ATCO Gas Australia has identified a range of marketing activities that will increase the number of connections to the Network and arrest the decline in average consumption per customer. This will generate more efficient use of Western Australia's abundant natural gas resource and result in lower prices to all customers over the long term. This increase of gas use (especially air-conditioning) will help reduce reliance on electricity and mitigate peak loads.

In summary, ATCO Gas Australia will:

- Invest in activities designed to increase awareness of the benefits of gas use
- Promote the use of gas appliances
- Identify areas that can be connected to the Network economically
- Increase the coverage of the network to improve access to more customers

ATCO Gas Australia will work closely with developers, retailers and builders to identify low cost opportunities to grow gas usage, increase Network utilisation and decrease costs to new and existing customers. ATCO Gas Australia will seek to make the connection process more efficient and identify opportunities where new customers can be connected for minimal cost.

ATCO Gas Australia is confident its proposed growth and marketing activities will arrest the recent decline in average consumption and increase the number of customers connected to the Network, whilst more than covering the costs incurred in connecting people to the Network. The proposed marketing expenditure will result in a positive net present value, thereby delivering decreased tariffs to customers in the medium to long term.

ATCO Gas Australia expects a 12.3% increase in new connections during the AA4 period, comprised of 341 large industrial customers[3] and 82,105 residential customers[4]. Without the proposed growth and marketing initiatives, new connections would only increase by 10%, resulting in higher costs per customer and a significant opportunity missed.

[3] Customers from the A1, A2, B1 tariff class.

[4] Includes customers form the B2 and B3 tariff class less the numbers of disconnections each year.

1.2.4 Legislative requirements

Several legislative and regulatory changes will affect ATCO Gas Australia's costs of service provision during the AA4 period, in particular:

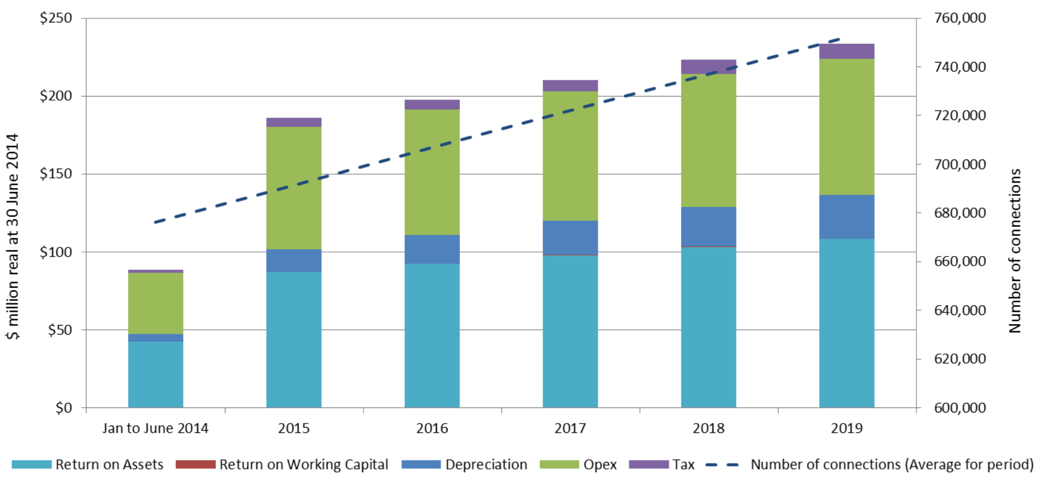
- Changes to the superannuation legislation, which increased the superannuation guarantee to 9.25% from 1 July 2013, further increasing to 12% by 2019
- Significant reforms to the Privacy Act regarding management and disclosure of personal information and direct marketing, which came in to effect in March 2014
- Changes to the Fair Work Act, which will influence flexible working arrangements, anti-bullying and right of entry provisions
- The State Government has indicated it will implement the bulk of the work place health and safety legislation already in place in all other Australian States (except Victoria) during 2014. While the legislation will largely replicate the same duties and responsibilities as the existing *Occupational Safety and Health Act 1984 (WA)*, there are new requirements that will affect ATCO Gas Australia

This proposal only includes costs associated with the changes in the superannuation legislation. Costs associated with other legislative changes will be assessed as new information becomes available. Once the impacts are known they will be incorporated later in this process or as a cost pass through event during AA4.

1.3 Cost of providing service

The total revenue to be recovered through reference tariffs for the AA4 period is $1,139.4 million. Figure 2 shows the composition of total revenue in each year and provides a comparison to the expected growth in connections over the same period[5].

Figure 2: Total revenue for AA4



ATCO Gas Australia proposes that the tariff increases required to collect the target revenue are uniform across the period, resulting in a real average annual increase in price of 1.6%.

[5] Note that the period commences on 1 July 2014 so the chart shows target revenue for only half a year.

ATCO Gas Australia will continue to provide the reference, non-reference and ancillary services offered under the existing access arrangement. However, modifications are proposed to tariff structures that will ensure the standing charges paid by all customers cover the costs of connection. This means that the overall charges to existing customers will not increase as a result of new customers connecting in the future. The increase in the standing charge will be offset by a decrease in consumption charges, which will offset the increase in the fixed charge to the majority of existing customers.

These tariff modifications are discussed in Chapter 12 (Reference tariffs) of this access arrangement information.

1.3.1 Application of a nominal rate of return

On 29 November 2012 the Australian Energy Market Commission (AEMC) issued its final determination on changes to the NGR concerning the determination of rates of return, and the ‘return on’ building block for covered gas networks.

The new rule 87 of the NGR requires application of a rate of return on a nominal vanilla basis which requires that the cost of inflation is able to be recovered through revenue in the period it is incurred. Like most network service providers, before the new rule 87 of the NGR came into effect, an allowance for inflation was added to the value of the capital base. Applying a nominal rate of return to an inflated capital base would result in recovering an amount of revenue for inflation twice.

The Australian Energy Regulator (AER) addresses the double count of inflation by using the PTRM (post tax revenue model) for determining revenue. The PTRM applies an inflated rate of return to an already-inflated capital base and then subtracts an amount accounting for the double application of inflation from the depreciation allowance. However, this defers recovery of depreciation to future periods and results in a rate of return equivalent to a real return. Applying the PTRM also carries potential for greater price increases in the future, as revenue amounts for depreciation in future periods would be higher than if depreciation was collected evenly from the outset.

ATCO Gas Australia considers a more efficient method of addressing this double-counting problem would be to not apply inflation, moving to a ‘full nominal’ capital base. By not indexing the network service provider’s asset base and applying straight line depreciation, a nominal rate of return is achieved, meeting the requirement of the Rule 87 change and removing a redundant step from the revenue calculation.

An outcome of this full nominal solution is that the depreciation allowance is collected earlier, which leads to potentially larger price increases in the short term; however, it delivers a lower price path over time than the indexing of the capital base.

ATCO Gas Australia is conscious of managing price impact on customers[6], therefore to mitigate short-term price increases resulting from the full nominal approach, ATCO Gas Australia proposes a transition over more than one regulatory period to reduce the price impact in the short term without forgoing lower prices in the long term.

Making this change will ensure that the price of ATCO Gas Australia’s service remains competitive while meeting the long term interests of customers and delivering a lower price path over time. This issue is discussed further in Chapter 9 (Capital base).

[6] In accordance with its obligation under s7 of the *National Gas Access (WA) (Local Provisions) Regulations 2009*

1.4 Return on investment

The allowed rate of return objective is set out at rule 87(3) of the NGR

> *87(3) The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services (the allowed rate of return objective).*

ATCO Gas Australia submits that the rate of return that meets this objective is 8.53% (nominal post tax), comprised of a return on debt of 7.09% and return on equity of 10.70%.

When calculating the rate of return, ATCO Gas Australia considered a range of accepted financial models and market information to ensure that the estimate of the return on debt and equity achieve the allowed rate of return objective. These included the Sharp-Lintner Capital Asset Pricing Model (SL CAPM), Fama French and dividend discount models.

The current Rate of Return Guidelines[7] (the Guidelines) state that only the SL CAPM is a relevant model to calculate the cost of equity. However, ATCO Gas Australia found that the Guidelines do not have regard to other relevant models and evidence and the input parameters do not represent the best estimates. Using the SL CAPM with poorly estimated parameters results in a return on equity considerably lower than would be commensurate with a benchmark efficient network service provider carrying a similar level of risk as ATCO Gas Australia. In fact, the approach proposed in the guideline produces a return on equity substantially lower than any other information model or estimate identified.

As a result, ATCO Gas Australia considers applying SL CAPM alone does not meet the NGR' allowed rate of return objective or the requirements of rule 87(5) of the NGR. For these reasons ATCO Gas Australia's proposal departs from the Rate of Return Guidelines.

There can be significant implications from adopting too low a return on equity. If the return on equity is too low, there is substantial risk that the network operator will not attract sufficient capital to invest in the network putting at risk sustainable efficient investment required to maintain future service capability to meet the need of customers over the longer term. This is especially pertinent for privately-owned businesses and their customers with multiple shareholders seeking sound investment returns with many investment options.

ATCO Gas Australia is not a government owned utility business. It is a privately owned utility company that must compete for capital. Like most private investors, ATCO share owners have choices in respect of their investments. As such, ATCO Gas Australia must compete with ATCO's other entities as well as other investments outside ATCO for funding.

ATCO investors take their responsibility seriously to keep utilities safe and reliable over a long period together with the community and for the benefit of customers. Where other investment options are more attractive than ATCO Gas Australia, investment in the Network may decrease to *only* that required to meet the safety and reliability requirements prescribed in the Safety Case.

Should investors deem the rate of return too low, there is a very real chance they could direct funds away from ATCO Gas Australia, meaning its proposal to invest in growing the customer base and achieving long-term real price reductions for customers would be compromised. As a result, the opportunity to provide a competitive energy supply to the Western Australian energy market for the long term benefit of customers would be forsaken.

[7] ERA Rate of Return Guidelines, 16 December 2013.

Despite the narrow scope of the current Rate of Return Guidelines, ATCO Gas Australia considers the NGR provides sufficient flexibility for regulators to apply a rate of return that recognises the realities faced by privately-owned network operators and other similar entities. ATCO Gas Australia therefore submits a 10.7% return on equity drawn from a weighted estimate of several well established financial models (including SL CAPM), market estimates and regression analysis. This provides a rate of return that satisfies the rate of return objective.

ATCO Gas Australia has also departed from the Guidelines in relation to estimating the cost of debt to take account of new information, adopt an appropriate term when estimating debt costs and choosing not to introduce an annual adjustment of the debt risk premium which would increase the risk faced by ATCO Gas Australia and impose additional costs on customers.

ATCO Gas Australia has considered expert evidence and financial markets, which show that investors in businesses of similar risk are receiving returns significantly higher than those currently being determined for rate regulated entities in Western Australia. The returns determined in Western Australia are even lower than those delivered by economic regulators for businesses of similar risk in other states of Australia, or comparable firms in Canada and the United States.

1.5 Conclusion

ATCO Gas Australia submits that the proposed revisions to the access arrangement comply with *National Gas (Access) Act (WA) 2009* and the requirements of the NGR (version 19, January 2014).

ATCO Gas Australia is committed to Western Australia for the long term. ATCO Group purchased the Network with a view to increasing competition in an energy market that is yet to meet its full potential. With a proven track record of efficient investment across its global portfolio and a corporate focus on sustainable growth and the long term interest of customer rather than maximum growth in the short term only, ATCO is confident it can work effectively with energy industry peers, the Government and regulatory bodies to help create a more customer-focused and competitive domestic energy market.

The opportunity to improve the energy sector is here now. Continued investment and pursuit of economic growth will improve security of energy supply to all customers on the Network and ultimately all Western Australians. Expanding the Network's reach and connecting it to new sources of supply will provide the diversity to respond to customer expectations and requirements in the supply, reliability and safety of the Network.

Furthermore, economic expansion will enable a sustainable gas supply and reduce the cost of gas supply to customers into the future. The revisions proposed for the AA4 period will enable ATCO Gas Australia to execute this strategy and allow customers to continue to enjoy a safe and reliable gas supply, setting the platform for long term benefits.



2. Context and document structure

2.1 Key messages

- ATCO Gas Australia is submitting its access arrangement revisions consistent with the National Gas Objective and in compliance with the National Gas Rules
- ATCO Gas Australia has used its well-established business planning and asset management process when developing its access arrangement revisions. This planning process considers performance over AA3, challenges expected during AA4 and corporate objectives
- ATCO Gas Australia met with customers and interested parties when developing its access arrangement revisions. Feedback from these stakeholders has been factored into the revisions where appropriate
- There have been significant changes to the National Gas Rules concerning rate of return since the last access arrangement revisions for the Network. This has meant that a change in approach to determining target revenue is required.
- ATCO Gas Australia proposes the AA4 to be five and-a-half years long, from 1 July 2014 until 31 December 2019, with tariff changes coming into effect on 1 January each year. This will align the access arrangement period with ATCO Gas Australia's financial planning and reporting cycle, which will simplify regulatory reporting to the ERA
- ATCO Gas Australia proposes a revision commencement date of 1 January 2020 and a review submission date of 1 September 2018
- ATCO Gas Australia has provided financial information on a **real** (June 2014) basis throughout this submission unless otherwise identified

2.2 National Gas Rules requirements

On 1 August 2011, following the acquisition by ATCO Limited through wholly owned subsidiary entities of all the issued shares in the entity WA Gas Networks Pty Ltd (WAGN) (ABN 90 089 531 975) (formerly Alinta Gas Networks Pty Ltd),ownership and operation of the Network passed to the ATCO Limited group of companies and as the covered pipeline service provider for the Network, commenced trading as ATCO Gas Australia. Subsequently, on 3 July 2012, WAGN was renamed ATCO Gas Australia Pty Ltd. Section 132 of the *National Gas Access (Western Australia) Law* requires a covered pipeline service provider to submit revisions to the access arrangement to the ERA for approval under the National Gas Rules (NGR).

ATCO Gas Australia's current access arrangement covers the period 1 January 2010 to 1 July 2014. ATCO Gas Australia is required to submit revisions to its access arrangement on or before 17 March 2014[8]. The current access arrangement and associated tariffs remain in effect until the revised access arrangement is approved by the ERA and an implementation date is agreed. The ERA's final determination will not occur before the AA4 commencement date of 1 July 2014.

[8] The submission date was revised from 30 June 2013 due to transitional provisions that were introduced as a result of the AEMC's rule change to rule 87 of the NGR.

Under rule 52 of the NGR , ATCO Gas Australia must, on or before the review submission date of an applicable access arrangement, submit an access arrangement revision proposal to the ERA. The access arrangement proposal must:

a) *set out the amendments to the access arrangement that the service provider proposes for the ensuing access arrangement period; and*

b) *incorporate the text of the access arrangement in the revised form.*

As part of the access arrangement proposal, this access arrangement information document sets out the rationale for proposed revisions and satisfies the *specific requirements for access arrangement information relevant to price and revenue regulation* set out in rule 72 of the NGR (see section 2.2.1 below).

The revised text for the proposed amendments is incorporated in the revised access arrangement accompanying this document.

2.2.1 National Gas Objective and Rule 72 requirements

The National Gas Objective is:

> *…to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.* [9]

ATCO Gas Australia considers that the revisions in this access arrangement proposal satisfy this objective.

Rule 72 of the NGR provides specific requirements for access arrangement information relevant to price and revenue regulation. To assist the reader, Table 1 provides a list of the specific requirements and a cross reference to the section of this access arrangement information that satisfies each requirement.

[9] Section 23, *National Gas Access (WA) Act 2009*.

Table 1: NGR specific requirements for access arrangement information

NGR	Requirement	Chapter
Rule 72(1)(a)	The access arrangement information must include the following: i. capital expenditure (by asset class) over the earlier *access arrangement period*; and ii. operating expenditure (by category) over the earlier *access arrangement period*; and iii. usage of the pipeline over the earlier *access arrangement period* showing minimum, maximum and average demand, and customer numbers in total and by tariff class.	Chapter 7 Appendix 2A Chapters 5
Rule 72(1)(b)	Explanation of how the capital base is arrived at, and demonstration of how the capital base increased or diminished over the earlier access arrangement period.	Chapter 9
Rule 72(1)(c)	Projected capital base over the access arrangement period, including: i. a forecast of conforming capital expenditure for the period and the basis for the forecast; and ii. a forecast of depreciation for the period including a demonstration of how the forecast is derived on the basis of the proposed depreciation method	Chapters 8 and 9
Rule 72(1)(d)	To the extent practicable, forecasts of pipeline capacity and of the utilisation of pipeline capacity over the access arrangement period, and the bases on which those forecasts have been derived.	Appendix 2A
Rule 72(1)(e)	A forecast of operating expenditure over the access arrangement period, and the basis on which the forecast has been derived.	Chapter 6
Rule 72(1)(f)	Key performance indicators used to support expenditure to be incurred over the access arrangement period.	Chapter 3
Rule 72(1)(g)	The proposed return on equity, return on debt and allowed regulatory return, for each year, including any departure from the *Rate of Return Guideline* and reasons for the departure.	Chapter 10
Rule 72(1)(ga)	The proposed formula to be used to estimate the cost of corporate income tax.	Chapter 11
Rule 72(1)(h)	The estimated cost of corporate income tax, including the proposed value of the imputation credits.	Chapter 11
Rule 72(1)(i)	Efficiency gains or losses carried over as a result of the operation of an incentive mechanism in the earlier access arrangement period.	Not applicable
Rule 72(1)(j)	The proposed approach to setting tariffs	Chapter 12
Rule 72(1)(k)	The rationale for the reference tariff variation mechanism.	Chapter 12
Rule 72(1)(l)	The rationale for any incentive mechanism.	Chapter 13
Rule 72(1)(m)	The total revenue to be derived from pipeline services for each year of the access arrangement period.	Chapter 11

2.2.2 Criteria for approval and use of regulatory discretion

When considering revisions to the access arrangement, the NGR provides that for a particular provision, the ERA has either:

- **No discretion** – which means the ERA must accept ATCO Gas Australia's proposal. The ERA has no discretion in relation to rule 50(2) of the NGR
- **Limited discretion** – which means the ERA must approve the element of the proposal if it complies with the NGL and is consistent with applicable criteria prescribed by the NGL. The ERA's discretion is limited in relation to rules 79, 89, 91 and 94 of the NGR
- **Full discretion –** which means the ERA has discretion to withhold approval if a preferable alternative exists that complies with the requirements of the NGL and is

consistent with applicable criteria prescribed by the NGL. The ERA has full discretion in relation to all rules of the NGR other than those stated above

2.3 ATCO Gas Australia's approach to preparing the proposed revisions

2.3.1 Business planning and review

ATCO Gas Australia's proposed revisions to the access arrangement are drawn from its business planning process (discussed in more detail in Chapter 3 of this document). ATCO Gas Australia sets clear strategic and business objectives for the organisation, which are reviewed annually. These objectives take into account risk, historical and forecast performance, external environment, legislative requirements and future demand.

Forecast expenditure is developed using ATCO Gas Australia's Asset Management Policy and Asset Management Strategy, which in turn drives short and long term business plans covering IT, human resources, legal, regulatory and resource functions.

2.3.2 Engagement with interested parties

ATCO Gas Australia sought input from interested parties during the development of the access arrangement revisions. ATCO Gas Australia provided an overview of the proposed investment plan and issues expected to arise during the AA4 period to the following stakeholders:

- Government agencies and Minsters
- Retailers
- Major end users
- Building industry and developer organisations
- Energy*Safety*

These discussions provided useful feedback, which has been considered and incorporated in to the proposed access arrangement revisions where appropriate. ATCO Gas Australia will continue to liaise with these interested parties throughout the access arrangement review process.

2.4 Significant changes to the National Gas Rules since the last Access Arrangement

Since the last revisions to the current Access Arrangement, there have been significant changes to the NGR.

On 15 November 2012 the Australian Energy Marketing Commission (AEMC) issued its final determination on changes to the NGR. The changes impact the determination of rates of return and consequently the return building block for covered gas networks.

The revised rule 87(5)(a) of the current NGR (Version 19) states:

> *in determining the allowed rate of return, regard must be had to:*
>
> a) *relevant estimation methods, financial models, market data and other evidence.*

ATCO Gas Australia considers that rule 87(5)(a) of the NGR requires regulators to consider a broad cross-section of data, rather than using a narrow approach or single method or model.

As alluded to in in the Executive Summary, the ERA's *Rate of Return Guidelines* suggests the SL CAPM is the only relevant pricing model. ATCO Gas Australia considers the SL CAPM is only one of many relevant models and there is substantially more information that must be considered to ensure compliance with rule 87(5)(a) of the NGR. ATCO Gas Australia has therefore departed from the Guidelines to comply with the NGR.

Further discussion in respect of the application of rule 87 of the NGR is provided in Chapter 10 (Rate of return) of this access arrangement information.

Revised rule 87 of the NGR also now require regulators to apply a nominal rate of return. Consistent with revised rule 87 of the NGR, ATCO Gas Australia is proposing not to inflate the capital base in the future and has proposed transitional arrangements to mitigate price impacts. Further discussion on this issue is provided in Chapter 9 (Capital base).

2.5 Length of the access arrangement period

Rule 50 of the NGR, provides that the length of an access arrangement is given effect by proposing a date by which revisions for the next regulatory period will commence. ATCO Gas Australia proposes the revisions to the access arrangement apply for a five and a half year period from 1 July 2014 to 31 December 2019.

To ensure a decision by the ERA for the period commencing 1 January 2020 occurs with sufficient time for the arrangements to be settled and to be in place for this date, ATCO Gas Australia proposes the **review submission date** (the date which ATCO Gas Australia will submit its proposed revisions to the access arrangement for the fifth access arrangement period) is 1 September 2018.

ATCO Gas Australia proposes a five-and-a-half year access arrangement period to be consistent with the calendar year and in turn, ATCO Gas Australia's financial planning and reporting. Aligning the period with the calendar year will simplify adjustments and comparisons between financial and regulatory reporting required by the ERA. Tariff variations would therefore occur from 1 January of every year.

2.6 Basis on which financial information is provided

The financial information provided in this Access Arrangement information is provided on a **real** basis (June 2014) unless otherwise identified.

2.7 Document structure

This access arrangement information is structured as follows:

- Chapter 3 – **Business overview, planning and performance**: an overview of ATCO Gas Australia, its business planning process for the AA4 period and proposed KPIs for the period
- Chapter 4 – **Services to be provided**: an outline of the services to be provided during AA4 including the reference services, non-reference services and changes to the template haulage contract
- Chapter 5 - **Demand**: an overview of forecast demand including customer numbers and consumption for the system by tariff class
- Chapter 6 - **Operating expenditure**: presents the forecast operating expenditure requirements for AA4, including business support, network, marketing and IT expenditure
- Chapter 7 - **Past conforming capital expenditure**: presents the past capital expenditure for the AA3 period compared to the AA3 forecast and assessment against the requirements for conforming capital expenditure
- Chapter 8 - **Capital expenditure**: presents the forecast capital expenditure for the AA4 period, consisting of sustaining network capital expenditure, growth capital expenditure, structures and equipment capital expenditure and Information Technology capital expenditure
- Chapter 9 - **Capital base**: an outline of the determination for the capital base for AA4 including the establishment of the opening capital base and the projected capital base, including depreciation and capital contributions
- Chapter 10 - **Rate of return**: presents ATCO Gas Australia's approach to forecast rate of return
- Chapter 11 - **Total revenue**: presents the calculation of the total revenue required for the period, including the form of revenue control
- Chapter 12 – **Reference tariffs**: outlines the tariff structure and methodology
- Chapter 13 – **Incentive mechanisms**: outlines the proposal in relation to incentive mechanisms
- Chapter 14 - **Fixed principles**: reasons for retaining and introducing fixed principles

3. Business overview, planning and performance

3.1 Key messages

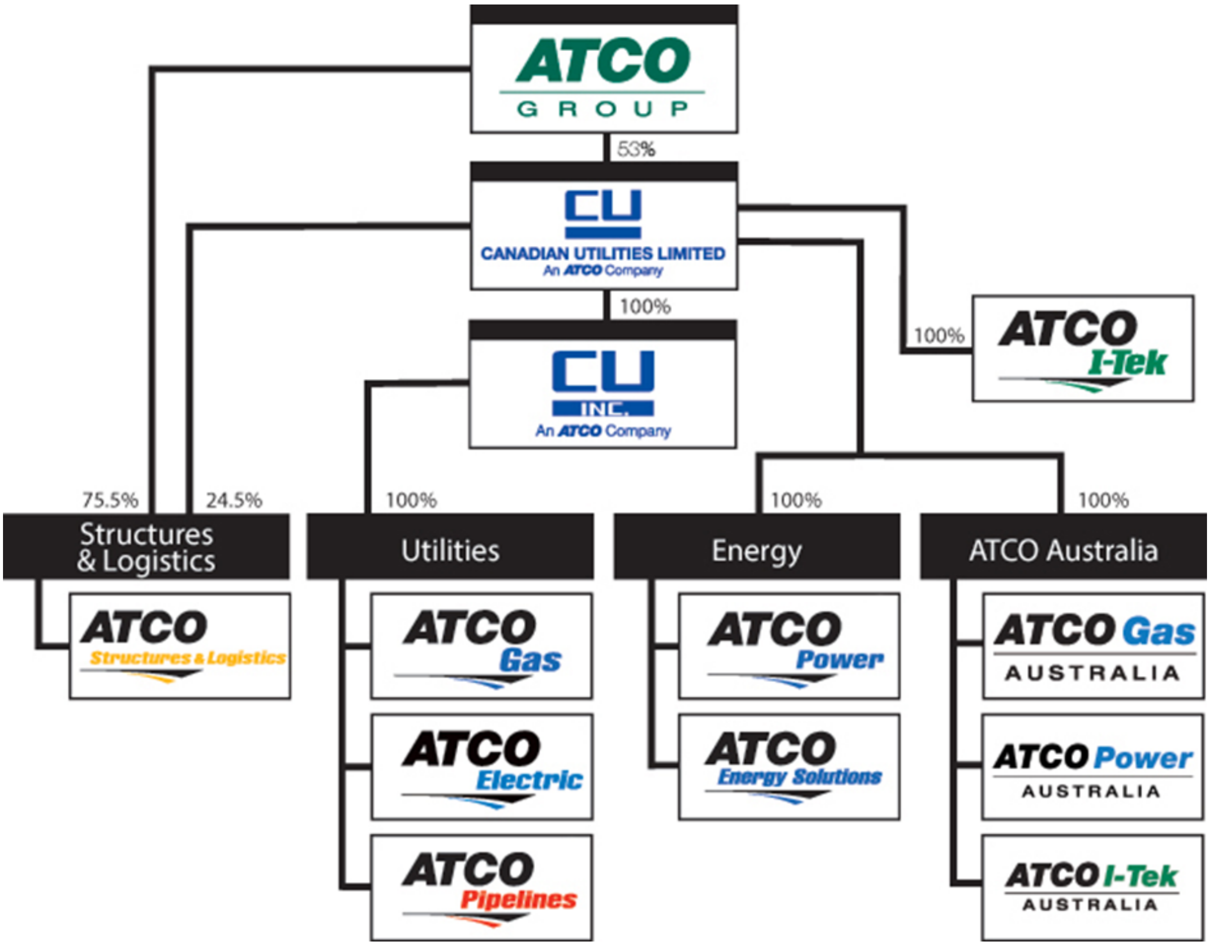
- ATCO Gas Australia is a part of ATCO, which has substantial experience in operating regulated utilities
- ATCO Gas Australia undertakes an annual business planning process, which establishes the plan for the next five year period. This process has informed this access arrangement proposal
- The business plan is supported by a robust asset management and network planning approach. ATCO Gas Australia's asset management plan and Safety Case are provided at Appendix 1 and Appendix 2 of this access arrangement information
- ATCO Gas Australia proposes eight KPIs to be included in the access arrangement proposal. These KPIs cover customer service, network integrity and expenditure performance

3.2 Who is ATCO?

ATCO Group is a diversified, Canadian-based, international group of companies focused on sustainable growth and achievement with approximately $16 billion in assets and more than 9,800 people actively engaged in Structures and Logistics (manufacturing, logistics and noise abatement), Utilities (pipelines, natural gas and electricity transmission and distribution), Energy (power generation, natural gas gathering, processing, storage and liquids extraction), and Technologies (business systems solutions).

As can be seen in the corporate organisation chart shown below, ATCO Gas Australia is part of the ATCO group of companies. ATCO Gas Australia is a privately owned subsidiary of Canadian Utilities Limited principally controlled by ATCO Ltd.

Figure 3: ATCO organisation chart



ATCO's long term success has come from the ability to combine exceptional operational experience, built from 100 years of service, with strong in house project delivery processes and a proven track record in delivering major projects. Globally, ATCO's utility capital program allocates approximately $2 billion per year to support an experienced team of engineers, asset accountants and commercial managers. ATCO's ability to leverage these people and resources ensures that its local or global teams can provide an unmatched level of service delivery anywhere in the world.

In April 2010, the ATCO Group Board of Directors approved an Australian growth strategy modelled after ATCO Group's existing Canadian enterprise of diverse yet complementary businesses to support the development of natural resources.

In January 2011, ATCO launched a new company – ATCO Australia. Under Managing Director & Chief Operating Officer, Steven Landry, ATCO Australia is focused on originating, developing, owning and operating energy infrastructure projects, drawing upon the expertise of ATCO Power, ATCO Pipelines, ATCO Gas, ATCO Electric, ATCO Energy Solutions and ATCO Structures & Logistics.

In July 2011, ATCO purchased the largest reticulated gas infrastructure in Western Australia through the acquisition of WAGN. The $1.1 billion purchase of what is now called ATCO Gas Australia, is one of the largest acquisitions in ATCO's history. ATCO Gas Australia is a gas distribution utility that serves the Perth metropolitan area and major towns and cities throughout the state of Western Australia. Its combined networks constitute approximately 13,500 km of natural gas pipelines connecting more than 683,000 customers.

ATCO Australia also includes ATCO Power Australia, which has three power stations operating in Brisbane, Adelaide and Karratha. In January 2011, these plants were transferred from ATCO Power, which operates 15 power generating facilities in Canada and the United Kingdom, to ATCO Power Australia.

While ATCO Australia's existing energy infrastructure does not include significant high voltage electrical transmission assets. ATCO provides a development and operational role for the transmission of electricity in Alberta, Canada. ATCO are currently engaged in the development phase of the East Alberta Transmission Line, a $400 million project, and nearing the execution phase for the Hanna Regional Transmission Development, an $800 million project.

As a successful owner and operator of energy infrastructure, ATCO Australia's key advantage is in developing high quality fit-for-purpose energy infrastructure and building robust business relationships with its customers, suppliers and contractors. Atco Australia's project management systems ensure projects are completed on budget, on schedule, and operate as designed, both reliably and economically, over the entire life of the asset. ATCO Australia, as part of the ATCO Group, utilises local knowhow as well as leveraging expertise from across the organisation's global footprint.

ATCO Gas and ATCO Pipelines operations are located in Canada and dovetail well with operations in Australia.

- **ATCO Gas (Canada)** – Located in Alberta, Canada, ATCO Gas (Canada) has delivered natural gas to municipal, residential, business and industrial customers for more than a century. ATCO Gas (Canada) operates approximately 39,000 km of natural gas distribution pipelines and provides service to 1.1 million customers in nearly 300 communities. ATCO Gas' delivery rates are among the lowest in Canada.

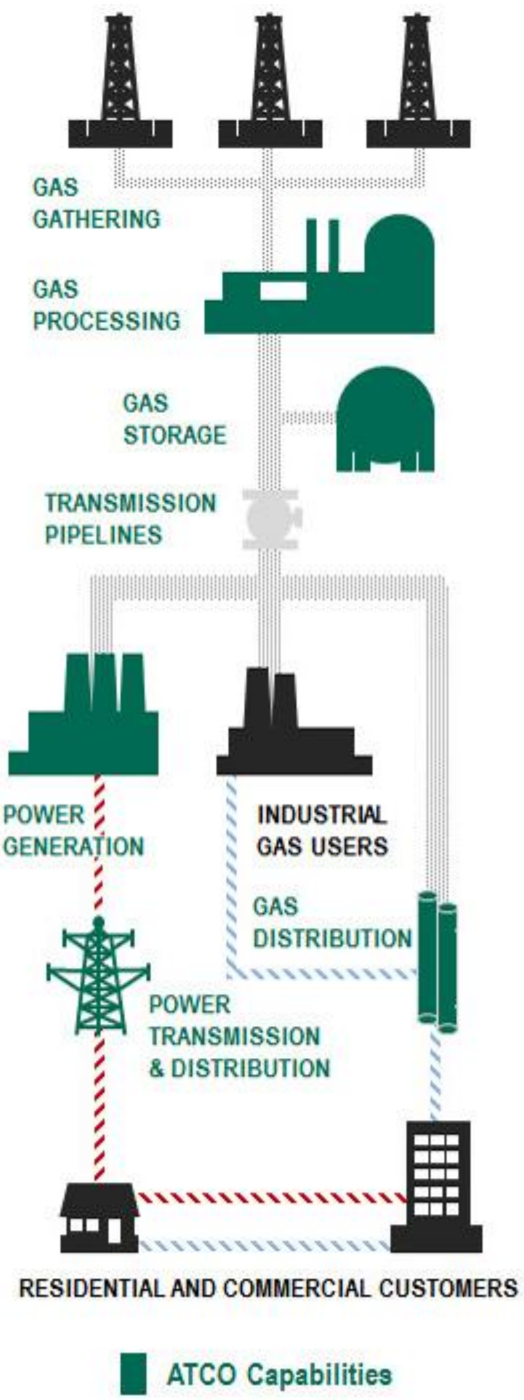
- **ATCO Pipelines** - Also based in Alberta, Canada, ATCO Pipelines owns and operates approximately 8,500 km of high-pressure transmission natural gas pipelines operating at pressure up to 9,800 kPa. The high-pressure transmission natural gas pipeline network provides service to nearly 4,000 receipt and delivery points

- **ATCO Gas Australia** - ATCO Gas Australia owns, operates and maintains the largest reticulated gas infrastructure in Western Australia. The gas reticulation networks serve Geraldton, Kalgoorlie, Albany, Bunbury, Busselton, Harvey, Pinjarra, Brunswick Junction, Capel and the Perth greater metropolitan area including Mandurah. These combined networks cover approximately 13,500 km, connecting about 683,000 end users to natural gas and, in the Albany network, liquefied petroleum gas (LPG). ATCO Gas Australia was formed on 29 July 2011, when ATCO Ltd. through 100% owned entities, acquired 100% of the shares in WAGN from Brookfield Infrastructure Group and DUET Group. WAGN was subsequently renamed ATCO Gas Australia Pty Ltd

ATCO Gas (Canada) and ATCO Pipelines' operations and regulatory framework are very similar to ATCO Gas Australia's. ATCO's entry into the Western Australian market is part of its long term plan for sustainable growth by developing, building, owning and operating energy infrastructure assets, utilising expertise developed over many years across ATCO's worldwide operations.

Together, ATCO in Canada and Australia have the following capabilities within the energy and utility industries. At ATCO Gas Australia, the business is able to draw on the significant experience, assets and resources of the ATCO group of companies worldwide.

Figure 4: ATCO Capabilities



ATCO's Electricity Generation, Transmission, and Distribution:

- ATCO operates and has ownership in three gas-fired power stations in Australia, located in Western Australia, Queensland & South Australia
- Globally, ATCO owns and/or operates 18 power plants with a combined capacity of approx. 4,900MW
- ATCO owns more than 72,000km of electricity transmission and distribution lines

ATCO's Gas Distribution Utility Assets:

- ATCO owns, operates and maintains the largest reticulated gas infrastructure in Western Australia with the combined networks covering approximately 13,500km
- ATCO's Western Australian distribution network connects more than 683,000 customers
- Globally, ATCO owns and operates more than 50,000km of gas distribution lines
- Globally, ATCO's utility companies (gas and electric) serve nearly 2 million customers in 300 communities

ATCO's Gas Gathering, Processing and Storage Assets:

- Globally, ATCO has ownership interest in seven natural gas gathering and processing facilities as well as four natural gas liquid extraction facilities
- Processing capacity of 1.8 billion cubic feet per day
- Ownership and operation of 40bcf of storage capacity

ATCO's Transmission Pipeline Assets:

- Globally, ATCO owns and operates approximately 8,500km of natural gas pipelines and transmission facilities
- 19 compressor sites
- Over 4,100 receipt and delivery points on ATCO's transmission pipeline systems
- Peak delivery of 3.8bcf per day to customers

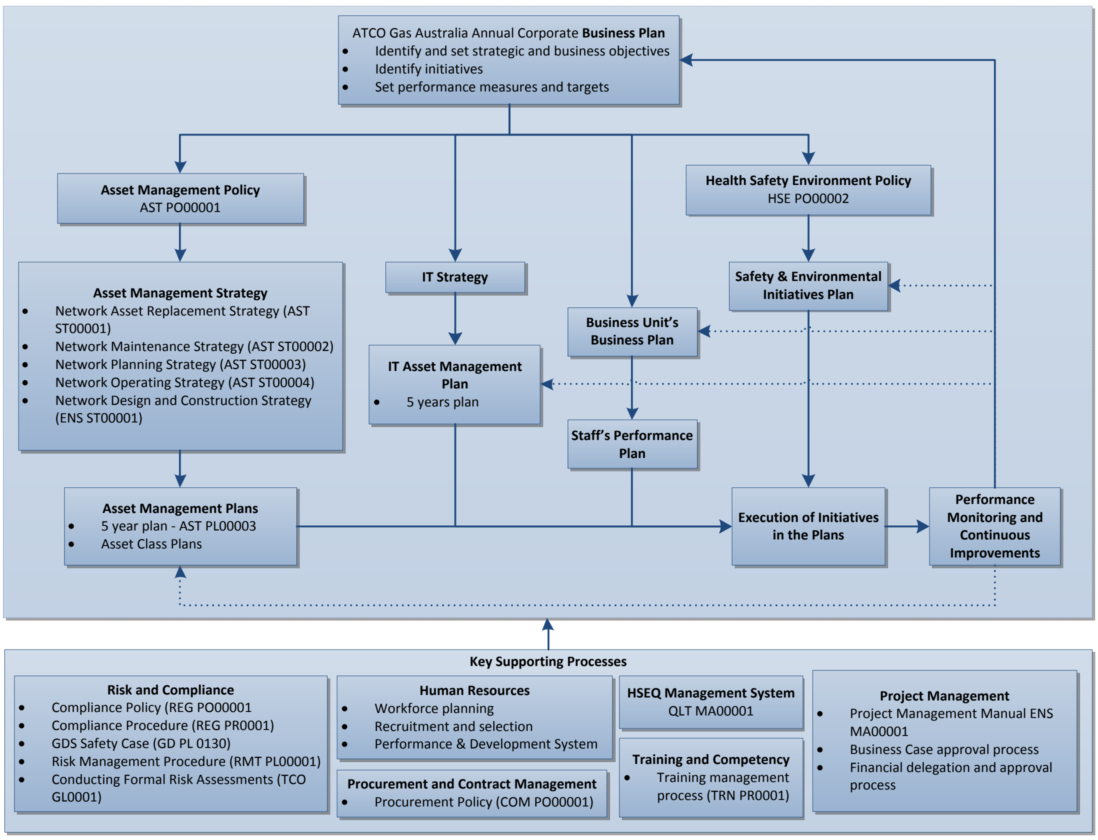
Since acquiring the Network in 2011, ATCO Gas Australia has significantly expanded the Network, adding 42,000 new customers and supporting the rapidly-expanding Perth suburbs. ATCO Gas Australia's vision is to grow the business and increase competition in the Western Australian energy market, whilst maintaining a safe and reliable gas supply, for the long term benefit of customers. ATCO Gas Australia has already commenced marketing activities and a television advertising campaign to help achieve this vision and is seeking to complement this with sustainable investment over the AA4 period. Forecast operating and capital expenditure is provided in Chapters 6 and 8, respectively, of this document.

3.3 ATCO Gas Australia’s business planning process

ATCO Gas Australia has developed the revisions in this access arrangement proposal, particularly the operating and capital expenditure forecasts, using information generated via its annual business planning process. ATCO Gas Australia’s annual business planning takes into account risk, historical and forecast performance, the external environment and future demand. Action plans are then developed to set out the plans, programs and strategies to meet the objectives. Measureable performance indicators and targets are established to monitor the organisation’s performance.

ATCO Gas Australia’s corporate objectives include growing connections and throughput growth whilst maintaining operational excellence and efficiency, and achievement of these objectives is supported by ATCO Gas Australia’s AMP, which is developed as part of the network planning process. The AMP is attached at Appendix 2. Figure 5 provides an overview of ATCO Gas Australia’s business planning process.

Figure 5: ATCO Gas Australia's business planning process



3.3.1 Asset management

ATCO Gas Australia’s AMP[10] is an important part of the annual planning process and considers asset management activities required over a five-year time frame, from which annual maintenance and capital works programs are developed. This AMP is supported by individual asset class plans and is designed to provide prudent and efficient management of the network assets.

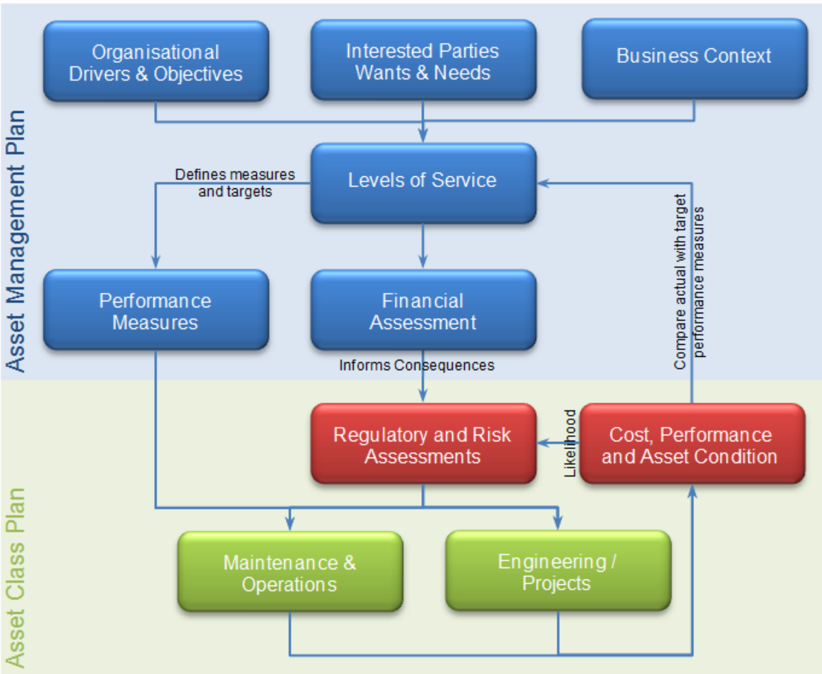
[10] Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014

The AMP:

- Identifies the levels of service required for the network
- Sets lifecycle asset management objectives, strategies and targets that promote continual improvement
- Outlines activities, plans and programs to deliver the asset management objectives and targets
- Monitors and measures asset performance and condition
- Ensures investment in lifecycle activities are prudent and efficient based on a whole-of-life approach

Figure 6 provides an overview of the interaction of key elements in the asset management planning process.

Figure 6: Key elements in asset management planning



ATCO Gas Australia schedules the review and development of the AMP to ensure the coming year's agreed capital and operating expenditure is approved by the end of the annual budget cycle. Although the current AMP projects forward for the five years of AA4, it is likely new projects will be added and some planned projects will change in the latter years.

3.3.2 Safety Case

Under the provisions of Part 4, Division 3 of the *Gas Standards (Gas Supply and System Safety) Regulations 2000* (GSSS Regulations) made under the requirements of the *Gas Standards Act 1972,* the network operator was required to submit a Safety Case. This was submitted by WAGN and received acceptance by the Director of Energy*Safety* on 28 July

2011[11]. The Safety Case was implemented over an 18 month period to January 2013 and is due to be revised during 2014.

The Safety Case provides a road map for the systems that the network operator must put in place for the safe operation of the Network. It describes systems for design, construction, operation, maintenance, training and supervision to manage risks arising from potential Network hazards. The Safety Case is regularly updated and complies with the requirements of AS 2885.1-2007 Pipelines – Gas and liquid petroleum Part 1: Design and construction, AS 2885.3:-2001 Pipelines – Gas and liquid petroleum Part 3: Operations and maintenance and AS/NZS 4645.1:2008 Gas Distribution Networks Part 1: Network Management and is audited by Energy*Safety.*

3.4 Key performance indicators for the AA4 period

Rule 72(1)(f) of the NGR requires access arrangement information to include:

> *… the key performance indicators to be used by the service provider to support expenditure to be incurred over the access arrangement period.*

ATCO Gas Australia has selected eight key performance indicators (KPIs) that reflect the performance of the network in delivering haulage services and are key drivers for capital and operating expenditure. These indicators are categorised as customer service, network integrity and expenditure. The customer service KPIs and UAFG are reported to the ERA annually as required under ATCO Gas Australia's distribution licence.

Table 2 sets out and describes the KPIs and AA4 target performance level.

Table 2: AA4 key performance indicators

KPI	Description	AA4 target
Domestic customer connection within timeframes	Measures the percentage of new customer connections to established domestic dwellings on the distribution network provided within any applicable regulated time limit. Note: A payment of $40 per (max $120) to affected end user if connection not completed within 5 business days. Conditions and exceptions apply.	>97%
Attendance to broken mains & services within 1 hour	Measures the percentage of attendance to broken mains and services within 1 hour of service request being received. This indicator is included in ATCO GAS AUSTRALIA's Safety Case and is covered by the Guarantee Service Level scheme. Note: A payment of $25 per event is made to an affected end user if attendance within 1 hour is not achieved.	>97%
Attendance to loss of gas supply within 3 hours	Percentage of attendance to loss of gas supply within 3 hours of service request being received. This indicator is included in ATCO GAS AUSTRALIA's Safety Case, and is also covered by the Guarantee Service Level scheme. Note: A payment of $25 per event is made to an affected end user if attendance within 3 hours is not achieved.	>97%
Total public reported gas leaks per 1 km main	Total number of confirmed gas leaks reported by the public (excluding third party damage) per kilometre of main.	<0.8

[11] Appendix 01: The safety case is officially known as "WAGN Gas Distribution System Safety Case" is likely to be re-named "ATCO Gas Australia Gas Distribution System Safety Case by the end of 2014 when the next revisions are accepted by Energy Safety.

KPI	Description	AA4 target
SAIFI	SAIFI (System Average Interruption Frequency Index) is the number of supply interruptions experienced by the average customer as a result of sustained interruptions. SAIFI is calculated as: (Σ Number of customers interrupted) / Number of customers served.	<0.005
Unaccounted for gas (UAFG) Rolling 12 Months % (4mths reporting lag)	UAFG is the difference between the amount of gas injected into the distribution system at all transfer points and the amount of gas withdrawn from the distribution system at all distribution supply points, which may include, but is not limited to: Leakage or other actual losses, discrepancies due to metering inaccuracies and variations of temperature, pressure and other parameters.	<2.9%
Operating expenditure per km of main	Total operating expenditure per year per total km of main.	$6,068
Operating expenditure per customer connection	Total operating expenditure per year per total number of customer connections.	$116

Note:performance data includes Albany and Kalgoorlie consistent with the information reported to the ERA in line with ATCO Gas Australia's annual compliance reporting requirements.

Historical performance and rationale for including these KPIs in the access arrangement proposal is provided below.

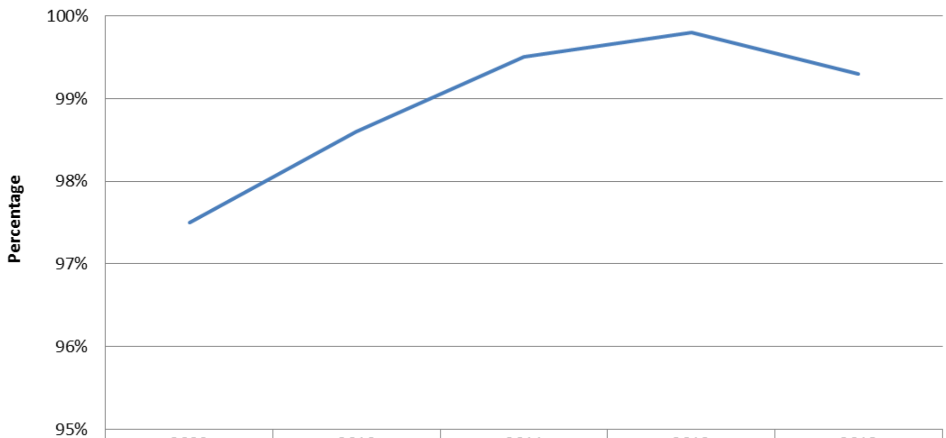
3.4.1 Customer service KPIs

(a) Domestic customer connection within timeframes

During the AA4 period, ATCO Gas Australia aims to increase the number of customers connected to the network and ATCO Gas Australia will undertake marketing activities to promote the use of natural gas and increase customer connections (discussed further in section 6.7.3(d) Business development and marketing). Reporting against this KPI will help ensure ATCO Gas Australia maintains connection times within customers' expected timeframes despite the forecast increase in connections.

Figure 7 shows ATCO Gas Australia's performance against this indicator during AA3.

Figure 7: Domestic customer connection within timeframe historical performance



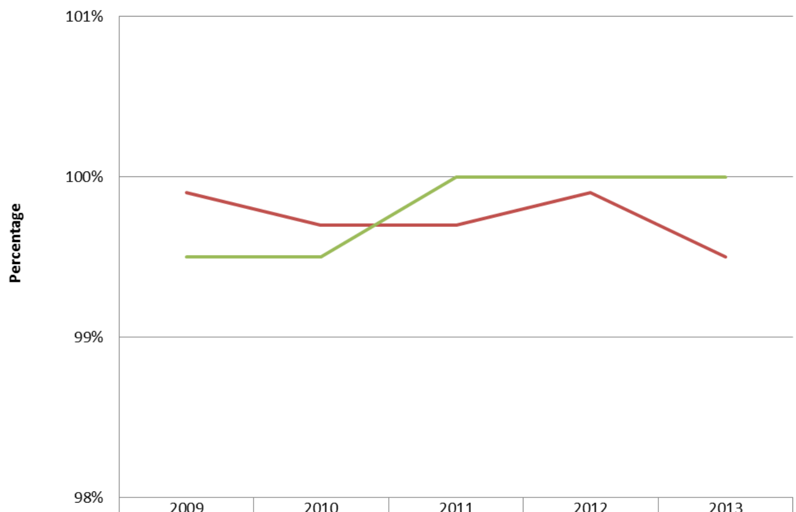
	2009	2010	2011	2012	2013
Domestic customer connection within timeframes	97.5%	98.6%	99.5%	99.8%	99.3%

(b) Attendance to broken mains and services within 1 hour & attendance to loss of gas supply within 3 hours

To ensure the safety of end users connected to the Network and the public, ATCO Gas Australia must respond to broken mains and services and loss of gas supply promptly and within the prescribed KPIs timeframes contained in the Safety Case. ATCO Gas Australia therefore proposes to report against these two KPIs, which will help ensure a high standard of fault response and safety performance is maintained.

Figure 8 shows ATCO Gas Australia's performance against these indicators during AA3.

Figure 8: Attendance to broken mains and services within 1 hour, and loss of gas supply within 3 hours historical performance



	2009	2010	2011	2012	2013
Attendance to Broken Mains & Services within 1 hour.	99.9%	99.7%	99.7%	99.9%	99.5%
Attendance to Loss of gas supply within 3 hours	99.5%	99.5%	100.0%	100.0%	100.0%

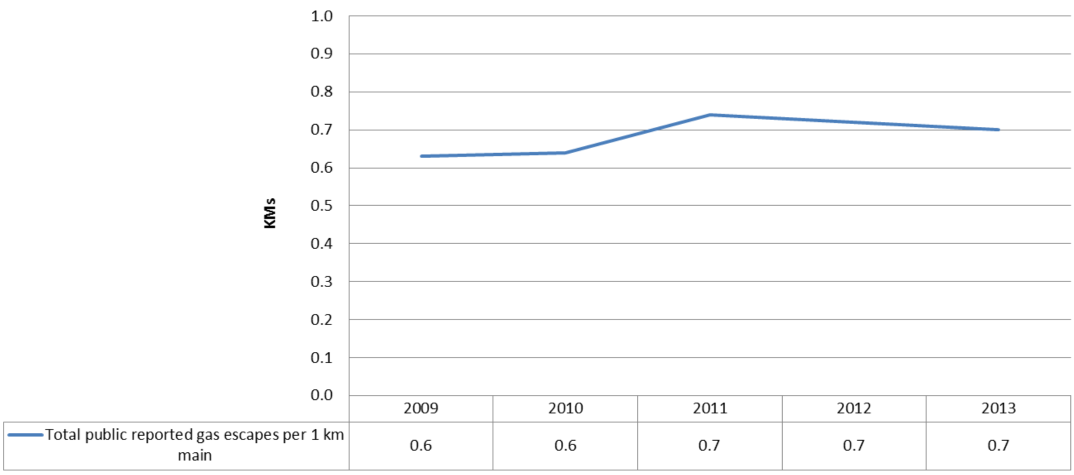
3.4.2 Network integrity KPIs

(a) Total public reported gas leaks per 1 km main

This indicator is chosen as it is more likely to reflect the performance of the Network and maintenance activities than the number of leaks reported by ATCO Gas Australia in total. This is due to the fact that because the leak survey activity will increase over AA4, which will result in the business reporting more leaks but will not necessarily reflect the effect that the maintenance activities are having. However, the additional remediation work and preventative maintenance should reduce the amount of leaks reported by the public compared to prior years, therefore it is submitted that public reporting is a more appropriate measure.

Figure 9 shows ATCO Gas Australia’s performance against this indicator during AA3.

Figure 9: Total public reported gas escapes per 1 km main historical performance



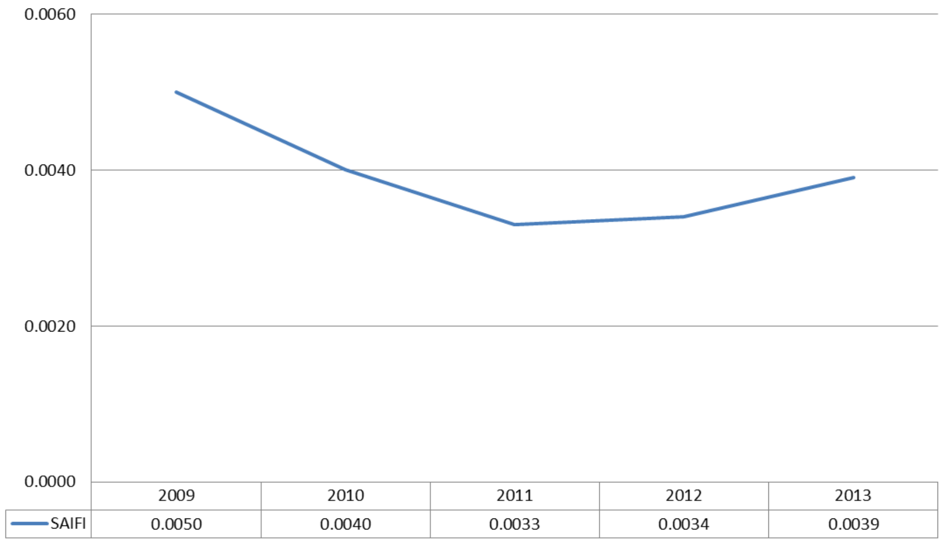
(b) SAIFI

SAIFI[12] is an industry accepted measure of the reliability and security of gas supply. During the AA4 period, ATCO Gas Australia will continue to invest in the Network, including installation of high pressure pipelines, interconnections and associated pressure reduction infrastructure to provide supply security for customers.

[12] The System Average Interruption Frequency Index (SAIFI) is commonly used as a reliability metric to indicate the average number of interruptions that a customer would experience in a year.

Figure 10 shows ATCO Gas Australia’s performance against this indicator during AA3.

Figure 10: System Average Interruption Frequency Index (SAIFI) historical performance

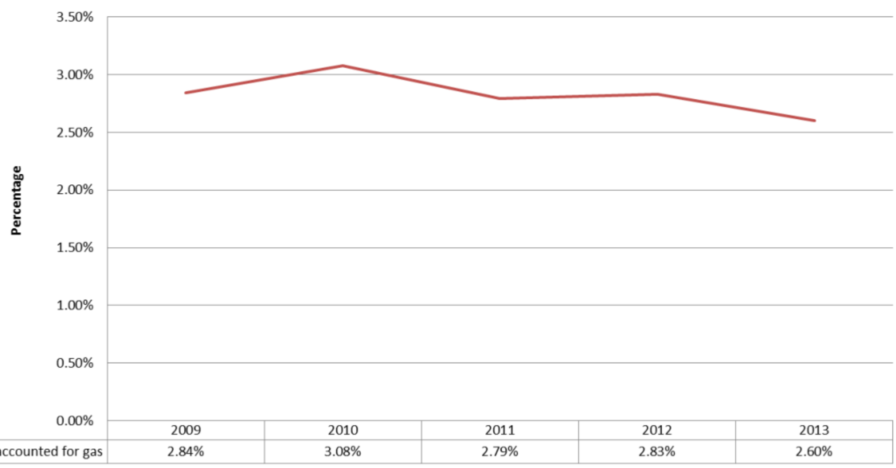


(c) Unaccounted for gas (UAFG) rolling 12 months %

UAFG is a cost of providing services. During AA4, ATCO Gas Australia will continue its UAFG reduction initiatives as supported by the Safety Case and the AMP and improve metering accuracy to customers. These initiatives will ensure continued compliance with GSSS Regulations and reduce the cost of UAFG to as low as reasonably practicable over the long term. Reporting against this KPI will help ATCO Gas Australia maintain its commitment to reducing the cost of UAFG.

Figure 11 shows ATCO Gas Australia’s performance against this indicator during AA3.

Figure 11: Percentage of unaccounted for gas historical performance



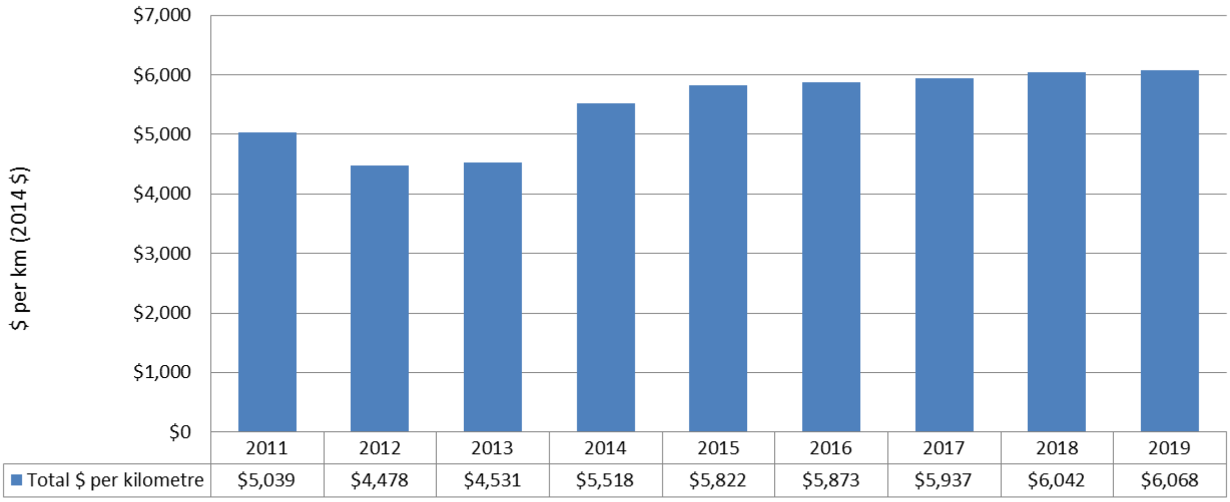
3.4.3 Expenditure KPIs

Expenditure measures are normalised for certain characteristics of a business that might contribute to a higher or lower operating cost. ATCO Gas Australia has chosen operating costs per kilometre and operating costs per connections to ensure the additional operating costs associated with additional kilometres of network and additional customers are properly incorporated in measures of efficiency.

(a) Operating costs per kilometres

Operating costs per km are expected to increase over the AA4 period as a result of the investment in programs required to mitigate safety risks and to support Network growth. The operating cost per km over the AA3 period is shown in Figure 12.

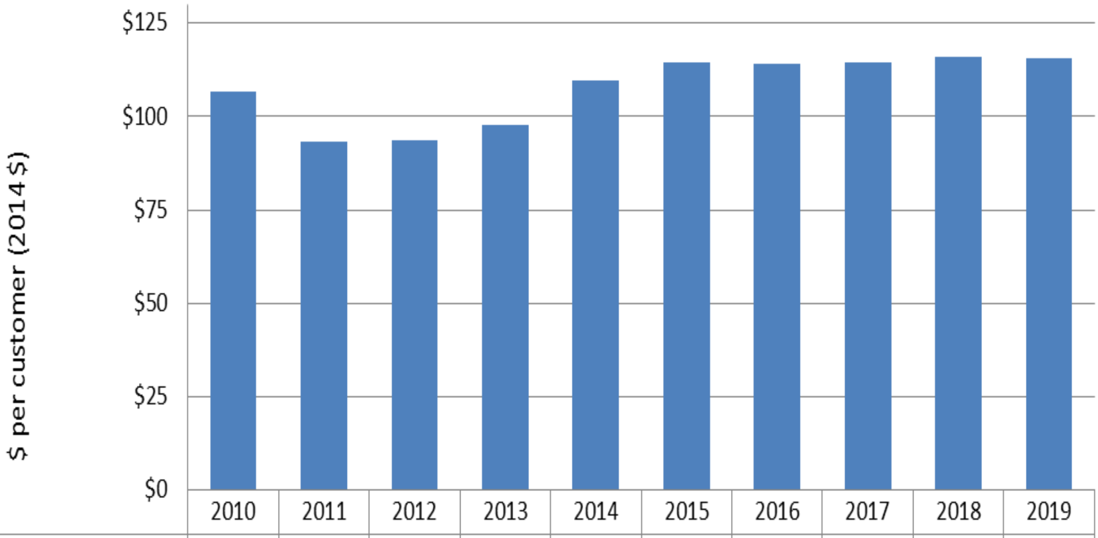
Figure 12: Operating expenditure per km of main historical performance



(b) Operating cost per customer connection

The operating cost per connection would be expected to be higher where a business has less customer connections per kilometres of main. Operating cost per customer connection will rise until 2015 when ATCO Gas Australia expects to achieve a sustainable level of operating costs to support the business and service capability of the Network. Beyond 2015, operating costs per customer connection will remain relatively constant.

Figure 13: Operating expenditure per customer connection historical and forecast performance



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total $ per customer	$106.54	$93.38	$93.65	$97.83	$109.45	$114.55	$113.92	$114.54	$115.96	$115.71

4. Services to be provided

4.1 Key messages

- ATCO Gas Australia will provide reference services A1, A2, B1 and B2 on the same basis as in AA3
- ATCO Gas Australia has modified the definition of the B3 reference service to allow a larger meter to be utilised for these customers, reducing the connection costs for residential customers that plan to have a large gas load
- ATCO Gas Australia will continue to offer non-reference (services that have different terms and conditions to the reference services) and ancillary reference services (such as disconnection and reconnection services) on the same basis as in AA3
- ATCO Gas Australia proposes minor changes to the Template Haulage Contract for reference services. These minor amendments clarify terminology and reflect recent changes to legislation

4.2 National Gas Rules requirement

Rule 101 of the NGR states:

(a) A full Access Arrangement must specify as a Reference Service:

(i) at least one pipeline service that is likely to be sought by a significant part of the market; and

(ii) any other pipeline service that is likely to be sought by a significant part of the market and which the [ERA] considers should be specified as a reference service.

(b) In deciding whether to specify a pipeline service as a reference service, the [ERA] must take into account the revenue and pricing principles.

4.3 Reference services

ATCO Gas Australia will offer five pipeline services as reference services during the AA4 period. These reference services are labelled A1, A2, B1, B2 and B3.

ATCO Gas Australia will also continue to offer five Ancillary Reference Services

Apart from the inclusion of an additional meter type in the definition of reference service B3, these services are substantially the same as those offered by ATCO Gas Australia during the AA3 period.

The proposed reference services are described below.

4.3.1 Service A1

Reference service A1 is unchanged. A1 is a pipeline service under which ATCO Gas Australia delivers gas to a user at a delivery point on the Network, where the following preconditions were met at the time the user (then a prospective user), submitted an application for the service:

- The prospective user is reasonably expected to take delivery of 35 TJ or more of gas during each year of the haulage contract; and

- The prospective user is reasonably expected to require a contracted peak rate of 10 GJ or more per hour; and
- The prospective user requests user specific delivery facilities

The other terms and conditions under which reference service A1 is provided are set out in the Template Haulage Contract, attached at Annexure E of the Access Arrangement document.

4.3.2 Service A2

Reference Service A2 is unchanged. A2 is a pipeline service under which ATCO Gas Australia delivers gas to a user at a delivery point on the Network, where the following preconditions were met at the time the user (then a prospective user), submitted an application for the service:

- Either (or both)
  - The prospective user is reasonably expected to take delivery of 10 TJ or more of gas, but less than 35 TJ of gas, during each year of the haulage contract, or is reasonably expected to require a contracted peak rate of less than 10 GJ per hour; and
  - An Above 10 TJ Determination was, or was likely to have been, made under the Retail Market Rules; and
- The prospective user requests user specific delivery facilities.

The other terms and conditions under which reference service A2 is provided are set out in the Template Haulage Contract.

4.3.3 Service B1

Reference Service B1 has been changed to include a standard $18m^3/h$ meter for connections to the medium / low pressure network where suitable. This is to allow flexibility for the development of additional meter options and to encourage the take up of connections at a lower overall costs to connect for similar reasons to those explained below in reference services B2 and B3. B1 is a pipeline service under which ATCO Gas Australia delivers gas to a user at a delivery point on the Network, where the following preconditions were met at the time the user (then a prospective user), submitted an application for the service:

- Either the prospective user is reasonably expected to take delivery of less than 10 TJ of gas during each year of the haulage contract, or is reasonably expected to require a contracted peak rate of less than 10 GJ per hour; and
- The prospective user requests user specific delivery facilities.

The other terms and conditions under which Service B1 is provided are set out in the Template Haulage Contract.

4.3.4 Service B2

Reference service B2has been changed to include a standard meter with a badged capacity of $12m^3/h$ or greater and less than $18m^3/h$. Reference service B2 continues to include a standard $12m^3/h$ meter. This is to allow flexibility for the development of additional meter options and to encourage the take up of connections at a lower overall cost to connect for similar reasons to those explained below in reference service B3. B2 is a pipeline service under which ATCO Gas Australia delivers gas to a user at a delivery point on the medium pressure/low pressure[13] parts of the Network using standard delivery facilities which include a standard 12 m^3/h meter. Most end use customers who receive reference service B2 consume less than 1 TJ of gas per year and are small use customers as defined in the National Gas Access (WA) (Local Provisions) Regulations 2009 (Local Provisions).[14]

The other terms and conditions under which reference service B2 is provided are set out in the Template Haulage Contract.

4.3.5 Service B3

Reference service B3 is a pipeline service under which ATCO Gas Australia delivers gas to an end use customer at a delivery point on the medium pressure/low pressure parts of the Network using standard delivery facilities. End use customers who receive B3 reference services consume less than 1 TJ of gas per year, and are small use customers as defined in the Local Provisions.[15]

ATCO Gas Australia has changed the definition of reference service B3 to include an additional meter option. This is to allow flexibility for the development of additional meter options and to encourage the take up of connections at a lower overall cost to connect. In the current access arrangement, B3 services are provided utilising a standard 8 m^3/h meter (AL8 meter[16]). For the AA4 period ATCO Gas Australia proposes B3 services will also include the ability to utilise a 10 m^3/h meter (AL10 meter).

An AL10 meter increases the load that can be delivered to the customer. Currently, if a residential customer's load is too large for an AL8 meter they have to take reference service B2 instead (which uses a 12 m^3/h meter). Switching to reference service B2 carries a $500 connection charge to cover the cost of the larger connection, meter box and meter.

ATCO Gas Australia proposes this $500 cost can be eliminated for many customers by offering an AL10 meter instead. The AL10 meter fits in the same size meter box as the AL8, with a minimal incremental cost. Offering this meter will allow existing B3 customers to increase consumption without changing to the B2 service. It also reduces connection costs for new larger residential customers. Reducing barriers to increased gas use improves the efficiency of higher consumption connections and reduces the costs to be recovered by all other customers.

In consideration of the consumption and typical appliance profile of recent B2 customer connections, ATCO Gas Australia identified a portion of these customers that would be adequately serviced by the AL10 meter. ATCO Gas Australia forecasts approximately 1% of new reference service B3 connections will choose an AL10 meter. The B2 customer connection forecasts also reflect this adjustment. The impact on customer numbers has been considered when determining the reference tariff.

The definition of Reference Service B3 in the (THC) has been amended. The other terms and conditions under which reference service B3 is provided are also set out in the (THC).

[13] The medium pressure/low pressure parts of the Network are those operating at nominal pressures of less than 300 kPa. This includes the high pressure regulators that reduce the pressure of gas below 300 kPa for subsequent flow into medium pressure/low pressure parts of the Network.

[14] Section 4(b).

[15] Section 4(b).

[16] Some existing B3 customers will have a 6m^3/hr meter (AL6 meter).

4.3.6 Ancillary reference services

In addition to the pipeline haulage reference services above, there are specific services that may be requested by the market. These are known as ancillary reference services.

During AA4, ATCO Gas Australia will continue offering the same ancillary reference services that apply in the current access arrangement period. These are:

- **Apply meter lock service** – where a lock is applied to a valve that comprises part of the delivery facility to prevent gas from being received at the relevant delivery point. This service is available for reference service B3 users
- **Remove meter lock service –** where a lock that was applied to a valve to prevent gas from being received at the relevant delivery point is removed. This service is available for reference service B3 users
- **Deregistration service –** where a delivery point is permanently deregistered by removing the delivery facility permanently, removing the delivery point in accordance with the Retail Market Rules and removing the delivery point from the delivery point register. This service is available for all reference service users
- **Disconnection service** – where a delivery point is physically disconnected and prevents gas from being delivered to the delivery point. This service is available in respect of delivery points at which a user is provided with reference service B2 or B3
- **Reconnection service** – where the delivery point is reconnected to allow gas to be delivered to the delivery point. This service is available in respect of delivery points at which a user is provided with reference services B2 or B3

Ancillary reference tariffs reflect the actual cost to ATCO Gas Australia of providing each service and therefore delivers the appropriate price signal. ATCO Gas Australia has recalculated prices for these services to reflect costs. These prices are detailed in Chapter 12 (Reference tariffs) and reflected in Annexure C of the Access Arrangement.

4.4 Non-reference services

ATCO Gas Australia negotiates commercial terms and conditions, including prices, for pipeline services that are not included within the scope of reference services. These are known as non-reference services (see Chapter 11 (Total revenue)) and will be agreed with individual customers.

4.5 Template Haulage Contract

Rule 48(1)(d)(ii) of the NGR provides that a full access arrangement must specify for each reference service *the other terms and conditions on which the reference service will be provided*.

Consistent with rule 48(1)(d)(ii) of the NGR, the other terms and conditions for providing reference services are specified in the THC, which is submitted as part of this access arrangement proposal.

ATCO Gas Australia has inserted footnote references to outline, where necessary and useful, the applicable legislative, technical and commercial considerations behind the relevant provisions of the THC and to explain the basis of the proposed drafting where relevant. This is intended to provide information to assist Prospective Users and interested parties in their understanding of relevant clauses in the THC and to promote more efficient negotiation processes.

ATCO Gas Australia is proposing amendments to the THC, which consist mainly of re-formatting, clarification of terminology used, and to reflect legislative changes. The proposed revised THC attached at Annexure E of the Access Arrangement.

A summary of the proposed THC amendments is set out below:

- Minor semantic and structural amendments are proposed to the THC. These changes are intended to remove duplication between clauses and to logically re-order provisions that may be better grouped together or arranged in a particular sequence.

- ATCO Gas Australia has provided a separate Glossary to be used for the access arrangement and the THC. This is intended to provide a uniform reference point for all documents comprising the access arrangement.

- ATCO Gas Australia is proposing minor amendments to clauses in the THC that refer to indemnity – clauses 6, 7 and 17. ATCO Gas Australia proposes that these clauses are amended to cover both direct and indirect damage and any loss or damage ATCO Gas Australia may suffer as a result of third party claims. The contractual risk has been allocated between the parties to the contract according to the responsibilities of the parties for their acts or omissions (creation of risk) and their respective abilities to manage or control those risks. Where risks and liabilities are equally shared or controllable, those risks have been allocated equally. The drafting proposed reflects these commercial principles.

- ATCO Gas Australia proposes minor amendments to the provisions regarding confidentiality – clause 21. This is intended to strengthen parties' confidentiality obligations for the mutual protection of both parties and in particular, with increasing gas retail sector competition, the protection of commercially sensitive information

- ATCO Gas Australia has reviewed the THC against the relevant National Gas Access (Western Australia) Legislation and Regulatory Instruments and has been amended or updated as required – these are identified in the Glossary and referred to directly, where relevant, in the footnotes.

- ATCO Gas Australia has taken account of relevant Australian Competition Tribunal decisions[17] and decisions of the AER[18] in respect of similar contract terms, and has reviewed the THC in the light of those decisions.

[17] The relevant decisions reviewed are Application by WA Gas Networks Pty Ltd (No 3) [2012] ACompT 12 – 8 June 2012 and Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013] ACompT 8 18 September, 2013.

[18] Annexure F of the Envestra (Albury) gas distribution network access arrangement: 1 January 2013 – 31 December 2017, 29 April 2013; Part C of the Multinet Gas gas distribution access arrangement: 1 January 2013 – 31 December 2017, 29 April 2013; and Allgas Energy (APT Allgas) gas distribution access arrangement: 1 July 2011 – 30 June 2016, 17 June 2011.

5. Demand

5.1 Key messages

- ATCO Gas Australia has utilised historical consumption and connection information in conjunction with external advice to forecast demand for the AA4 period
- During AA4 the number of customers is forecast to grow at a rate of 2.1%. Consumption per customer during AA4 is forecast to continue to decline, however overall consumption is forecast to grow at 2.1%
- ATCO Gas Australia proposes to move from a heating degree day (HDD) method for normalising the weather impact on demand, to an effective degree day (EDD) method. The EDD method incorporates a greater number of climatic variables affecting consumption and provides a better statistical fit for the consumption behaviour of WA gas users thus achieving an increased consumption forecasting accuracy.[19]
- The EDD methodology was adopted by the Australian Energy Market Operator (AEMO) in 2012[20] and has been accepted by the Australian Energy Regulator (AER) in recent regulatory determinations
- Growth forecasts include the anticipated additional customer connections and consumption ATCO Gas Australia expects to achieve with its proposed marketing activities[21]

5.2 National Gas Rules requirements

The rules most relevant to estimating demand is rule 74 of the NGR which requires that:

1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.

2) A forecast or estimate:

   a) must be arrived at on a reasonable basis; and

   b) must represent the best forecast or estimate possible in the circumstances.

This chapter outlines ATCO Gas Australia's methodology to forecast customer numbers and volumes for the AA4 period. The forecasts are a key input to determine reference tariffs and required capital and operating expenditure. ATCO Gas Australia has obtained advice from Economics Consulting Services (ECS)[22] and Core Energy[23] to forecast new connections and total demand across all tariff classes.

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[19] Envestra South Australia 2011-2016 Access Arrangement decision, Envestra Victoria 2013-2017, Multinet Gas Access Arrangement 2013-2017, SP Ausnet Access Arrangement decision 2013 – 2017.

[20] http://www.aemo.com.au/Gas/Planning/Victorian-EDD-Weather-Standards-Review.

[21] As discussed later in section 5.5.3.

[22] Appendix 03: ATCO Gas Australia Connections Forecast, Economics Consulting Services, May 2013.

[23] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014.

ATCO Gas Australia has forecast its best estimate of demand for the regulatory period, based on the available information at the time of this access arrangement submission.

5.2.1 Tariff classes

There are five categories of connection to the Mid-West and South West Gas Distributions Systems (the Network). These are described in Table 3.

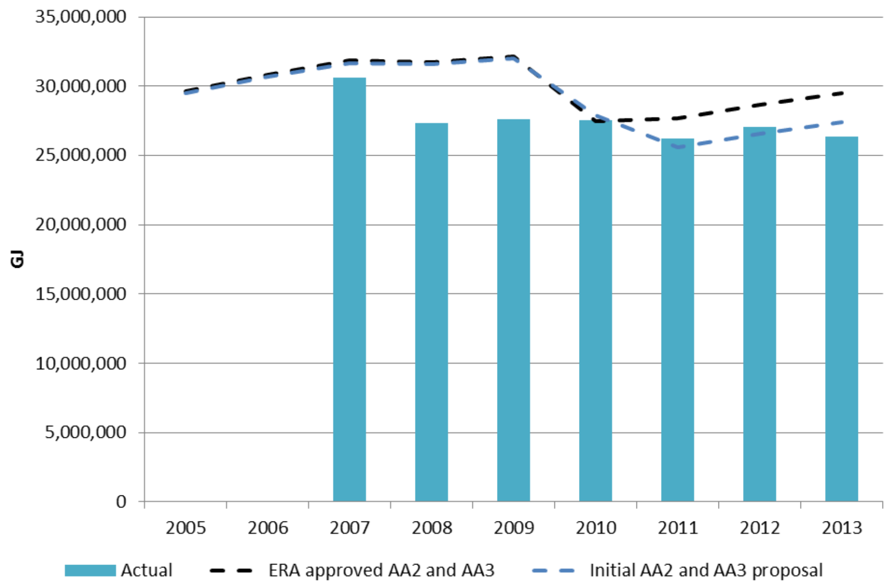
Table 3: Reference tariff services

Tariff classes	Description
A1	typically **large industrial customers** with annual consumption greater than 35 TJ
A2	typically **small industrial customers or large commercial customers** with annual consumption between 10 and 35 TJ
B1	typically **commercial customers** with annual consumption between 0.5 and 10 TJ
B2	typically **small-to-medium businesses** with annual consumption less than 1 TJ
B3	**typically residential customers and some small businesses** with annual consumption less than 1 TJ

5.3 Historical demand and forecast accuracy

On average, volumes over the current access arrangement period (AA3) were 6% lower than the demand forecast approved by the ERA in its AA3 determination[24]. Actual demand was also lower than the initial forecasts proposed by the network operators in the AA2[25] and AA3 submissions[26] (see Figure 14).

Figure 14: Actual and forecast volumes for all customers



[24] http://www.erawa.com.au/cproot/10615/2/20120625%20-%20D90667%20-%20GDS%20-%20ATCO%20-%20Amended%20Access%20Arrangement%20Decision%20-%20incorporating%20Tribunal%20decision.pdf.

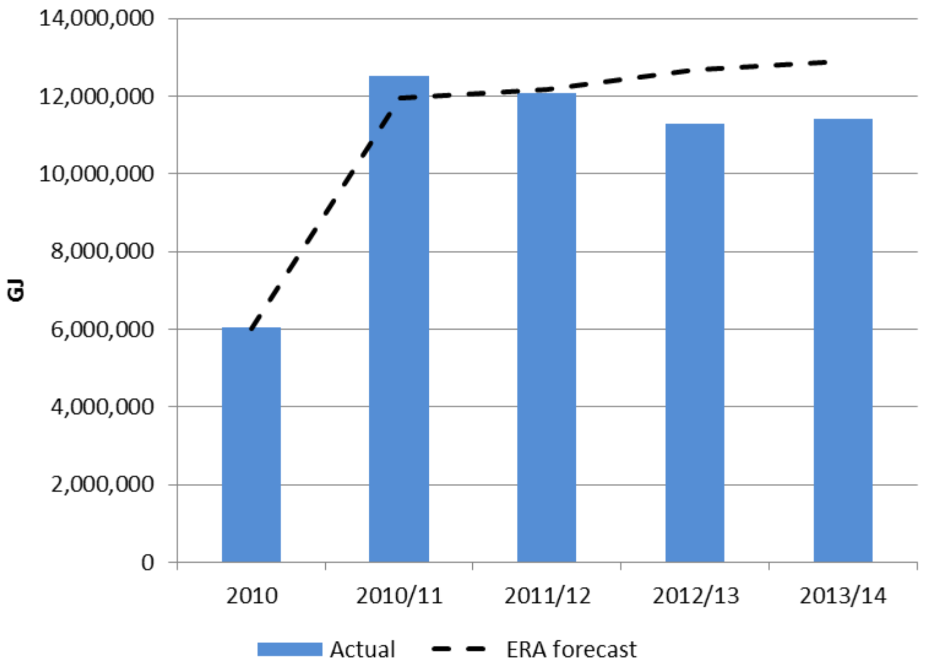
[25] http://www.erawa.com.au/cproot/4267/2/Revised_AAI.pdf.

[26] http://www.erawa.com.au/cproot/8357/2/20100215%20WAGN%20-%20Proposed%20Revisions%20to%20the%20AA%20for%20the%20WAGN%20Gas%20Distribution%20Systems%20Submission%20-%20Public%20Version.pdf.

The volume of gas transported was lower than forecast throughout the AA3 period across all tariff classes. In only two instances (A1 in 2010/11 and A2 in 2011/12) did usage exceed the forecast. The main cause of the overall shortfall was lower than expected usage by A1 (major industrial) and B3 (residential) customers.

Lower A1 usage was primarily the result of the loss of demand from two industrial plants that were shut down. It is understood, as advised by the respective retailers, that the reasons for these closures followed the downturn of the related international commodity prices during 2012 in the AA3 period. Figure 15 shows actual consumption by A1 tariff connections compared to the ERA-approved forecast.

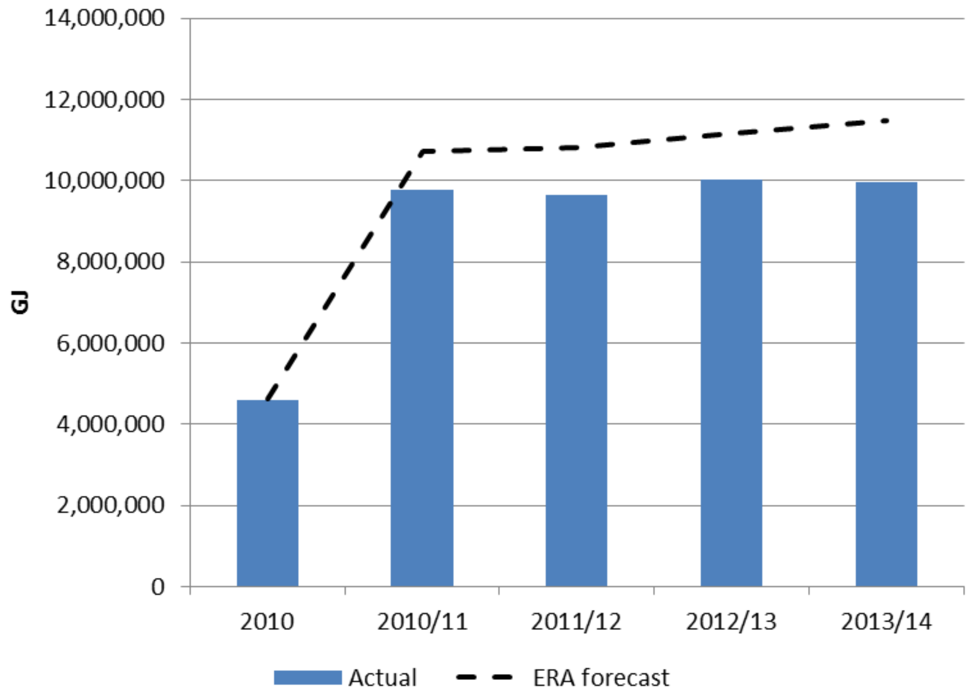
Figure 15: Comparison of ERA approved forecast consumption with actual consumption for A1 customers in AA3[27]



For the B3 connection category (residential and some small businesses), demand was below forecast levels throughout the AA3 period (see Figure 16).

[27] Note 2010 is for the half year only (January 2010 to June 2010). Customer numbers by tariff class in AA3 is provided in Appendix 2A.

Figure 16: Comparison of ERA approved forecast consumption with actual consumption for B3 customers in AA3[28]



Lower B3 usage has been attributed to:

- Weather conditions, with three years of the AA3 period significantly warmer than the 10 year average, as illustrated in Table 4.3 of the report by Core Energy[29]
- The effect of significant retail gas price increases on gas usage. The retail price of gas increased by 21% over the AA3 period
- Further penetration of reverse cycle air-conditioning as a heating alternative, which has been driven by subsidised electricity prices and the advent of solar photovoltaic cells
- Continued subsidisation of electricity prices[30]
- Improved energy efficiency levels in appliances and changes to the building code for new home construction to improve energy efficiency

The extent of the impact of these factors was not included in forecasting consumption for AA3 which has led ATCO Gas Australia to review its forecasting methodology for the AA4 period to take account of these factors.

The implications of overestimating demand forecasts are significant for network service providers. During the AA2 period $50.1 million less revenue than forecast was recovered. In AA3 $51.5 million less revenue was recovered than that determined to be required given

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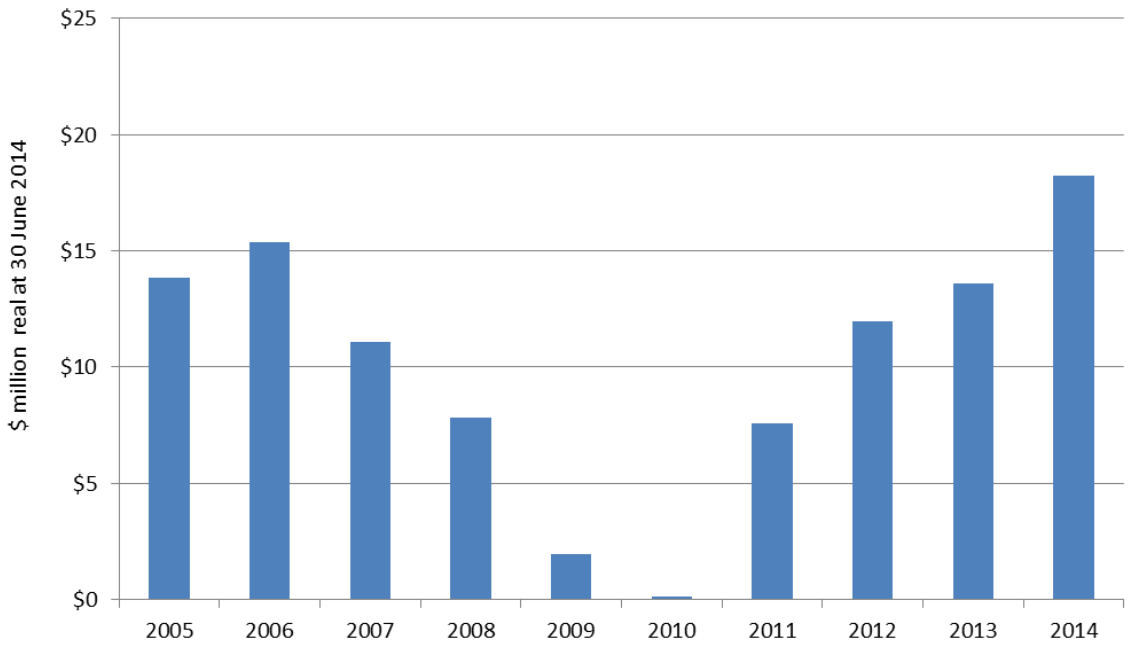
[28] Note 2010 is for the half year only (January 2010 to June 2010).

[29] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014, page 18.

[30] http://www.erawa.com.au/cproot/10639/2/20120704%20Synergys%20Costs%20and%20Electricity%20Tariffs%20-%20Final%20Report.PDF, see also http://www.finance.wa.gov.au/cms/content.aspx?id=15096.

the forecast costs to be incurred. Figure 17 shows the annual under recovery over the last two access arrangement periods.

Figure 17: Under recovery of revenue over AA2 and AA3



To improve the accuracy of demand forecasting in AA4, ATCO Gas Australia engaged Core Energy to help apply a more robust methodology to forecasting gas usage in Western Australia. Core Energy has conducted similar work for other Australian gas distribution businesses and recommended that ATCO Gas Australia employ the EDD (effective degree day) method of weather normalisation. ATCO Gas Australia reviewed the results from Core Energy of the proposed methodology which are as outlined within their attached report.[31] The improved demand forecasting methodology used in this access arrangement proposal is described in the following section.

5.4 Forecast methodology

Similarly to AA3 the gas demand forecast has been developed by using the forecast number of connections by tariff class (A1 to B3) and determining the expected average consumption per connection in each tariff class. However, there are various drivers that directly impact consumption and customer numbers. These drivers can be extremely difficult to predict, for example, energy policy changes or where historical data and observed impacts might not be available.

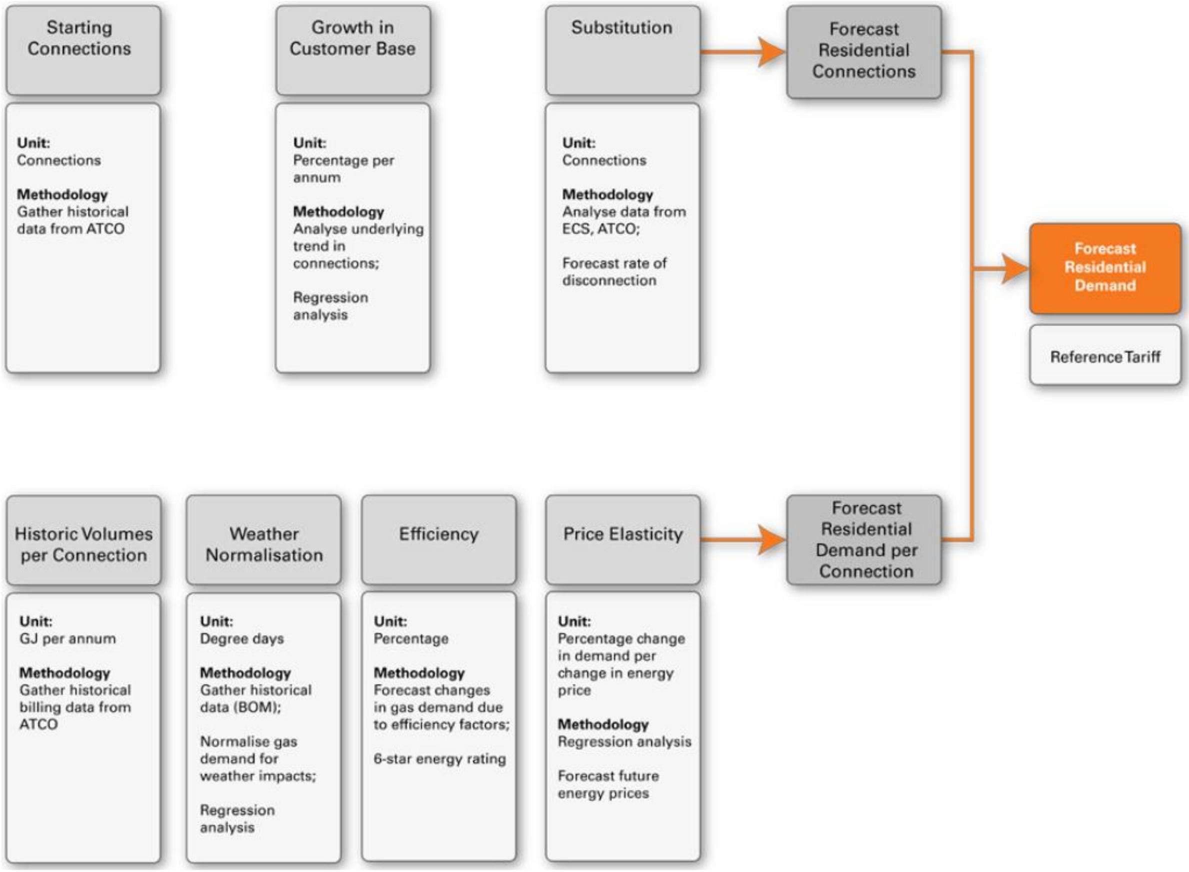
The methodology used by Core Energy accounts for the uncertainty of data by using comprehensive qualitative and quantitative analysis. Core Energy's full methodology is provided in Parts 4 and 5 of their report.[32]

The initial step is to identify factors expected to influence customer demand over the forecast period. Figure 18 illustrates the key factors expected to influence B3 customers' demand over the AA4 period.

[31] Appendix 05: The Use of EDD for Weather Normalisation, CORE Energy Group, January 2014.

[32] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014 from p.16.

Figure 18: Residential demand drivers



The Core Energy Report provides comprehensive analysis of each of these drivers.[33] Two key elements of this analysis are summarised in the following sections.

5.4.1 EDD weather normalisation

One of the most significant improvements to the forecasting methodology being employed for AA4 is the use of EDD (effective degree day) weather normalisation. There is a strong relationship between gas demand and weather. Lower than normal temperatures increase gas demand for heating and hot water. To ensure extreme cold or similar impact one off events do not unduly bias demand forecasts, it is a well-accepted practice by gas distribution businesses to adjust actual gas consumption to remove this bias.

During the past two access arrangements, the forecast demand has been developed using the HDD (heating degree day) weather normalisation method. The HDD method only considers average daily temperature data in the determination of a HDD. Furthermore these heating degree days are defined relative to a base temperature. ATCO Gas Australia's previous demand forecasts used 18°C as the base temperature. The calculation of a HDD is therefore the base temperature minus the average of the daily maximum and minimum temperatures. If the value is less than or equal to zero, that day has zero HDD's. But if the value is positive, that number represents the number of HDD's on that day. The rolling 10 year average of HDD's is used as the baseline HDD forecast.

Adopted by the Australian Energy Market Operator (AEMO)[34], the EDD method extends the concept of HDD by taking other measurable factors that affect consumer behaviour into

[33] Appendix 05: The Use of EDD for Weather Normalisation, CORE Energy Group, January 2014.
[34] Appendix 05: The Use of EDD for Weather Normalisation, CORE Energy Group, January 2014.

consideration in addition to temperature. EDD has been used extensively in the Victorian gas industry since its development in the 1970's. The components included in EDD are:

- Temperature (as measured in degree days)
- Wind chill (the impact of wind velocity to increase heating propensity)
- Insolation (the effect of outside sunshine in lowering heating propensity)
- A seasonal component (the effects of the above factors are more pronounced in winter than summer)

EDD is a more accurate measure for weather normalisation as it utilises a greater range of variables that impact weather and consumption, and results in a framework that fits more closely to actual daily demand. The EDD method captures physiological effects beyond just temperature and provides a more robust insight into the drivers of gas demand.

Statistically, the EDD method is a better estimate because it has a stronger correlation between weather and monthly B3 gas usage. Correlation is a statistical measure that indicates the extent to which two or more variables fluctuate together such as weather and gas consumption. The R coefficient of determination is a statistical measure of how well the regression line approximates the real data points which is represented as r^2. The EDD method has an r^2 of 0.942 compared to 0.919 when using the HDD method[35]. The higher correlation implies the EDD method provides a more accurate method of normalising historical Network demand.

The method used for weather normalisation includes the following steps[36]:

(a) Obtain historical weather data for the Perth Airport weather station from the Bureau of Meteorology. Perth Airport has been chosen as the most appropriate location due to its lower elevation than the Perth Metro site. This lower elevation is more representative of the elevation across the system.

(b) Use regression analysis consistent with the method used by the Australian Energy Market Operator in its '2012 Review of the Weather Standards for Gas Forecasting' to develop an EDD index which best represents gas demand

(c) Use regression analysis to identify an appropriate normalised set of EDD

(d) Calculate abnormal EDD by comparing actual and normalised EDD

(e) Use regression analysis to estimate the sensitivity of each tariff class to EDD

(f) Multiply abnormal EDD by the sensitivity factor to determine abnormal gas demand due to weather

The EDD approach was accepted by the Australian Energy Regulator in respect of Envestra's South Australian[37] and Victorian[38] access arrangements, and SP Ausnet Victorian access arrangements

[35],Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014 p.11.

[36]Appendix 05: The Use of EDD for Weather Normalisation, CORE Energy Group, January 2014, p.12.

[37]http://www.aer.gov.au/sites/default/files/AER%20draft%20decision%20-%20Envestra%20%28SA%29%20access%20arrangement%202011%20to%202016.pdf.

[38] http://www.aer.gov.au/sites/default/files/Envestra_0.pdf.

To ensure greater accuracy Core Energy developed a Western Australia specific temperature of 22.36°C for modelling weather normalised demand. This was necessary to recognise that ATCO Gas Australia's network operates in a much hotter region, on average, relative to other states that also use the EDD method. The WA-specific measure acknowledges that WA consumers may not be accustomed to cooler temperatures and will start using their hot water and space heaters at higher temperatures than would be observed in other states. The WA threshold has been statistically tested by Core Energy and provides the best fit statistically to actual demand.

5.4.2 Gas Price Sensitivity

ATCO Gas Australia's gas demand forecast adopts a long-term price elasticity factor, which is consistent with previous regulatory submissions accepted by the AER. To determine the impact of historical and forecast movements in gas price on demand forecasts the following gas sensitivity methodology was applied[39]:

(a) Identify long-term sensitivity factors accepted in relevant gas price regulatory decisions

(b) Validate long term factors against a derivation of short term sensitivity factors

(c) Apply sensitivity factor against historical data series and future forecasts, having regard to the lagged effect of price increases on demand

(d) Validate the long-term price elasticity estimates, by conducting short-run price elasticity analysis

The forecast considers the combined influence of lagged historical wholesale gas price increases and additional future increases will continue to materially impact gas demand. These increases are based on assumptions of:

- Increasing wholesale gas production costs
- Expiration of lower priced legacy gas contracts, which will be renegotiated at significantly higher prices
- Changes in supply/ demand dynamics of the WA gas market, including linkages to the Asian Liquefied Natural Gas (LNG) export market.

Core Energy has utilised a linear trend in the regression analysis to forecast demand. This methodology assumes all factors that have affected gas demand in the past will continue to affect gas demand in the future. With this in mind, specific adjustments are made before and after the calculation of the statistical trend.

Pre-trend adjustments include:

- Normalising historical demand to account for weather
- Normalising historical demand to account for one-off increases in retail gas prices

Post-trend adjustments include:

[39] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014 p.12.

- Adding the lagged effect of increases in retail gas prices, as well as any future changes in price resulting from:
    - The introduction of a price on carbon in July 2012
    - Wholesale gas price increases
- Adding the effect of 6-Star Building Standards[40] (residential gas demand only) – introduced in May 2011 but not accounted for in the historical trend.
- Adding the impact of new planned marketing initiatives which would not have been accounted for in the historic trend as illustrated in Figure 21.

5.5 B3 demand forecast

The key components of the B3 demand forecasts are:

- Forecast number of connections
- Demand per residential connection

5.5.1 Average residential connections

The majority of Network connections are residential B3 customers. New connections are driven by the number of new dwellings completed, the proportion of those dwellings choosing to connect to gas and the number of existing houses connecting to natural gas. ATCO Gas Australia commissioned Economics Consulting Services (ECS) to prepare a report on the forecast number of new B3 Network connections over the AA4 period. The actual number of new B3 connections has been forecast to flatten from 2016 in line with the expected flattening of the number of new houses forecast to be built. The report is provided at Appendix 6.

Table 4 shows ECS' forecast of new B3 connections for the period 2014 to 2019.

Table 4: ECS' forecast number of new B3 connections 2014 to 2019[41]

	2014	2015	2016	2017	2018	2019	Average annual growth rate
New B3 customers	17,490	17,740	17,760	17,760	17,760	17,760	2.1%

ECS' estimate of the number of new B3 connections was then factored into Core Energy's methodology to forecast demand for the AA4 period. Core Energy applied the following method to determine the number of B3 connections to the Network in each year of the AA4 period[42]:

(a) Obtain ATCO Gas Australia's historical connection data

(b) Obtain forecasts of new connections prepared by ECS and ATCO Gas Australia's connections forecast

[40] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014 p.26.
[41] Excluding the Kalgoorlie and Albany connections included in the ECS report.
[42] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014 p.9.

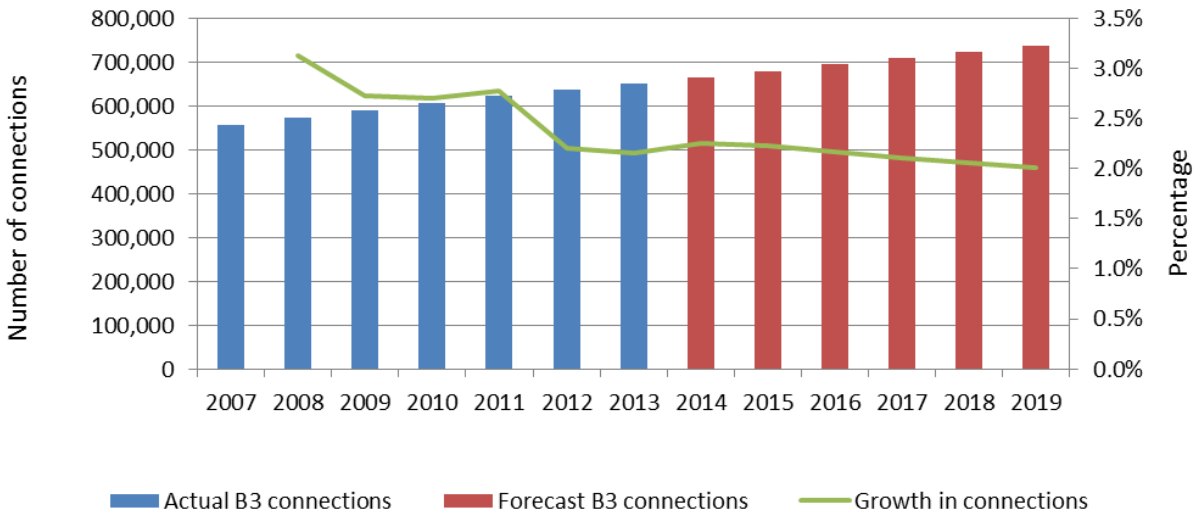
(c) Determine the historical disconnection rate using data provided by ATCO Gas Australia

(d) Forecast connections by applying new connection forecasts and the historical disconnection rate to average connection trend

(e) Adjust connections for the impact of new planned marketing initiatives and the impact of new AL10 metering classifications (the definition of B3 reference tariff service is to include the use of an AL10 meter in AA4 – see Chapter 4 Services).

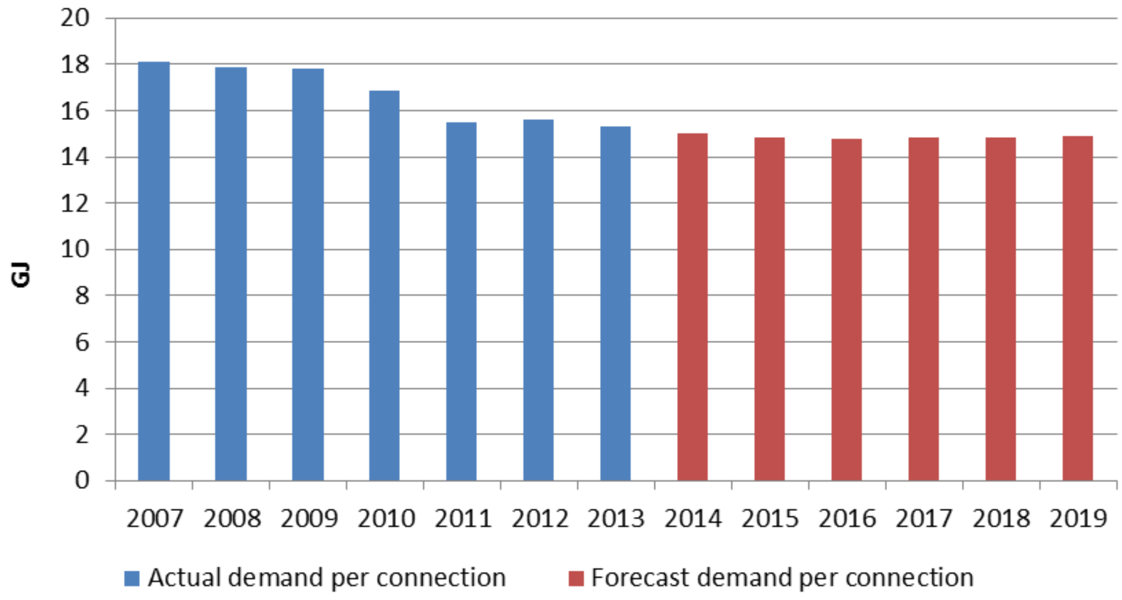
B3 customers are forecast to increase over the AA4 period, with an average growth rate of 2.1%. Figure 19 shows historical and forecast B3 connections and growth rate.

Figure 19: Historical and forecast B3 connections and growth rate



The average consumption for each B3 customer has been falling for some time and a modest decline is expected to continue in AA4 (see Figure 20).

Figure 20: Average consumption for B3 customers over time



This historical decline in average gas consumption (-2.7% from 2007 to 2013) is caused by a range of factors including; wholesale and retail gas price increases, changes to 6-star building standards and the improving energy efficiency of gas appliances.

These factors will continue to have an effect during AA4, however ATCO Gas Australia considers the decline in consumption will be slightly less as a result of the marketing activities ATCO Gas Australia plans to conduct during the period. The forecast impact of these marketing activities is discussed in section 5.5.2 below. The table below represents the forecast connections and average consumption of B3 customers. The connections numbers quoted are net of disconnections.

Table 5: Forecast B3 customers and average consumption per customer

	2014	2015	2016	2017	2018	2019
Forecast new connections	17,740	17,990	18,010	18,010	18,010	18,010
Forecast disconnections	3,133	3,203	3,275	3,346	3,416	3,487
Forecast connection numbers (net of disconnections)	664,763	679,549	694,284	708,948	723,542	738,065
Forecast demand per connection (GJ)	15.0	14.8	14.8	14.8	14.8	14.9

5.5.2 Impact of future marketing on demand forecast

ATCO Gas Australia has identified estimates of average load and customer numbers directly attributable to new planned marketing initiatives across its Network[43]. Core Energy has accounted for future marketing as a post-forecast adjustment to average demand and customer numbers. Table 6 shows the additional forecast demand from B3 customers due to planned marketing initiatives.

[43] The proposed marketing initiatives are discussed in Chapter 6 of this access arrangement information.

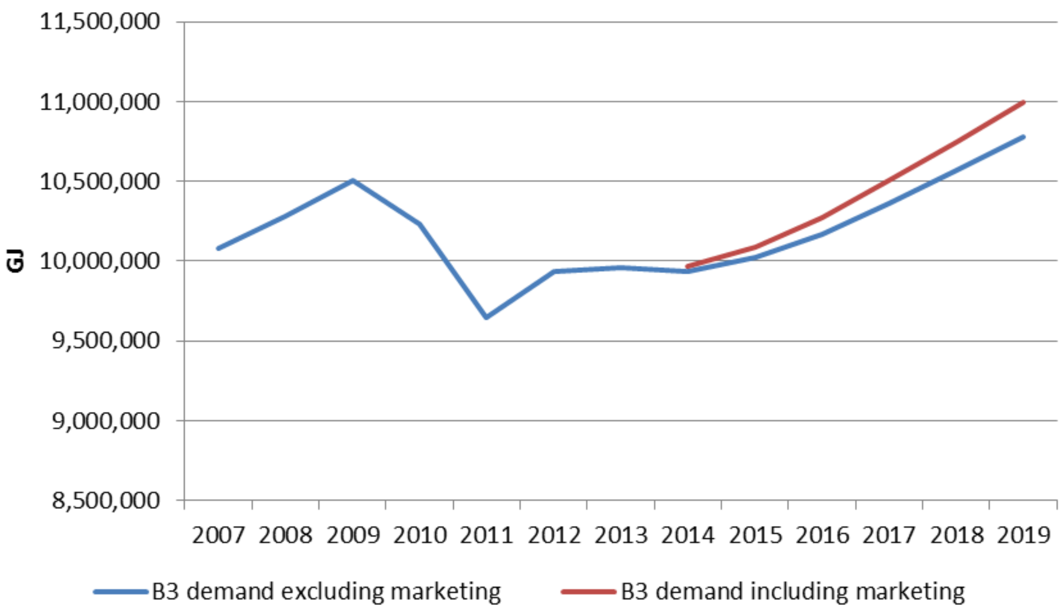
Table 6: Impact of planned marketing initiatives on B3 customer numbers and consumption

	2014	2015	2016	2017	2018	2019
Incremental connections due to marketing	1,515	1,391	1,238	1,196	1,196	1,196
Incremental consumption per customer (GJ)	0.05	0.10	0.15	0.20	0.25	0.30
Cumulative incremental demand due to marketing (GJ)	33,238	67,955	104,143	141,790	180,885	221,420

The marketing initiatives are expected to increase consumption from B3 connections by 1.2% over AA4. ATCO Gas Australia submits that total demand for B3 customers will increase at an average annual rate of 2.0% (customer growth incorporating marketing effort).

The following figure 21 represents the expected impact on forecast demand from the marketing initiatives and the historical and forecast of total B3 demand.

Figure 21: Comparison of B3 demand with and without marketing initiatives



5.6 B1 and B2 demand forecast

B1 and B2 Forecast demand is the product of the forecast number of connections and demand per connection. Average commercial connections are forecast using regression analysis to estimate the historical trend in connection growth, applying this trend to forecast average connections and then adjusting the forecast for the impact of planned marketing activities. The process for forecasting demand per connection is similar to that followed for B3 customers and involves:

- Weather normalisation of total demand to remove the bias of abnormal weather movements on historical demand
- Determining demand per connection by dividing total demand by average connections
- Adjusting historical demand per connection for the effect of specific price increases

- Estimating forecast demand per connection by applying the historical trend identified through regression analysis to existing demand per connection
- Adjusting the forecast demand per connection for factors not encompassed in the historical trend such as the lagged effect of historical increases in retail gas prices, as well as any future changes in prices resulting from the introduction of a price on carbon and the forecast wholesale gas prices

ATCO Gas Australia forecasts total demand from B1 customers is likely to increase at an average rate of 2.0% over the AA4 period. This is a product of a forecast average increase in B1 connections of 4.0% and average decrease in demand per connection of 2.0%.

ATCO Gas Australia forecasts total demand from B2 customers is likely to be flat over the AA4 period. This is due to the combined effect of a forecast 4.4% average increase in B2 connections offset by a forecast 4.2% average decrease in demand per B2 connection (see Figure 22).

Figure 22: Historical and forecast total B1 & B2 demand

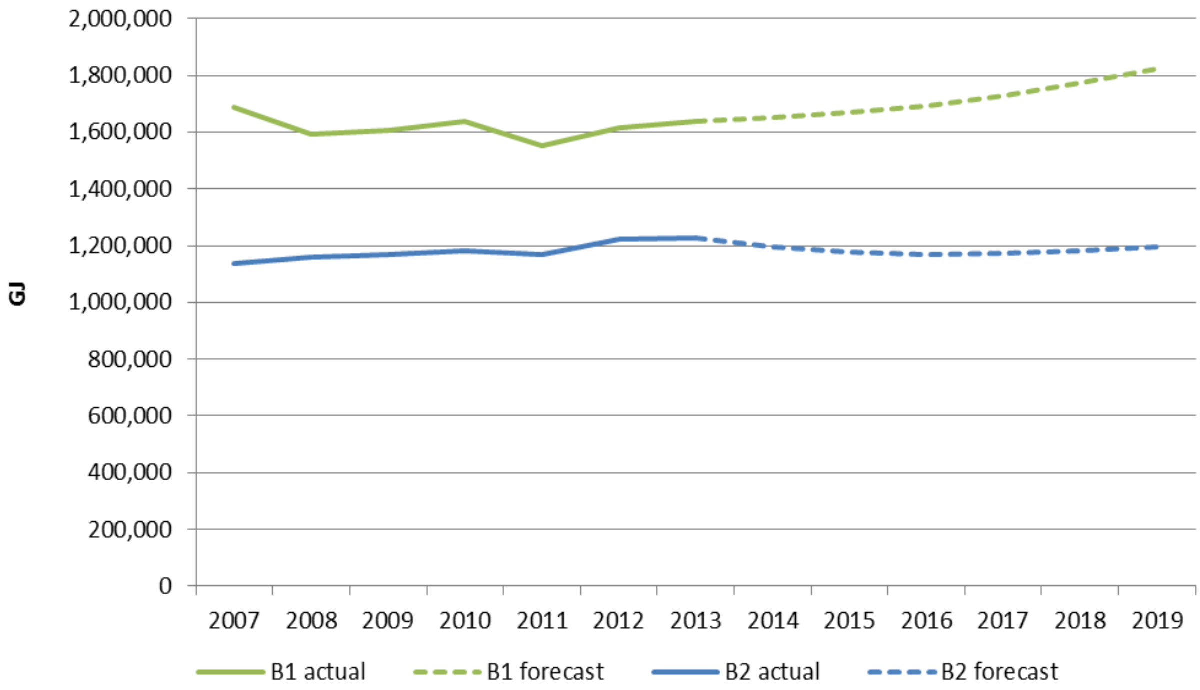


Table 7 shows forecast B1 and B2 connection numbers and demand for the AA4 period.

Table 7: Forecast customer numbers and demand for commercial customers

B1 tariff	2014	2015	2016	2017	2018	2019	Annual average growth rate
Connection numbers	1,410	1,468	1,528	1,589	1,652	1,717	4.0%
Demand (GJ)	1,652,379	1,667,284	1,691,685	1,729,881	1,775,516	1,823,895	2.0%
B2 tariff							
Connection numbers	9,932	10,346	10,792	11,270	11,781	12,326	4.4%
Demand (GJ)	1,194,484	1,177,612	1,169,788	1,173,334	1,183,114	1,195,512	0.0%

5.7 A1 and A2 demand forecast

The forecasting methodology for A1 and A2 customers follows the same general process as that outlined for B1 and B2 customers. However, only the A2 customer segment receives an adjustment for the impact of planned marketing activities. This is because A2 customers are more likely to be influenced by the proposed marketing activities than the major industrial A1 segment as these customers' consumption behaviours are generally linked to processing facilities. The proposed marketing activities do not focus on these customers.

ATCO Gas Australia forecasts total demand increases in both categories of industrial connections over the AA4 period. A1 total demand is forecast to increase at an average rate of 1.8%. This results from a forecast 0.3% average decrease in connections and a forecast 1.9% average increase in demand per connection.

ATCO Gas Australia forecasts A2 total demand is likely to increase at an average rate of 5.5%. This results from a forecast 5.2% average increase in connections and a forecast 0.4% increase in demand per connection.

Figure 23 shows historical and forecast demand for A1 and A2 category connections.

Figure 23: Historical and forecast total A1 & A2 demand

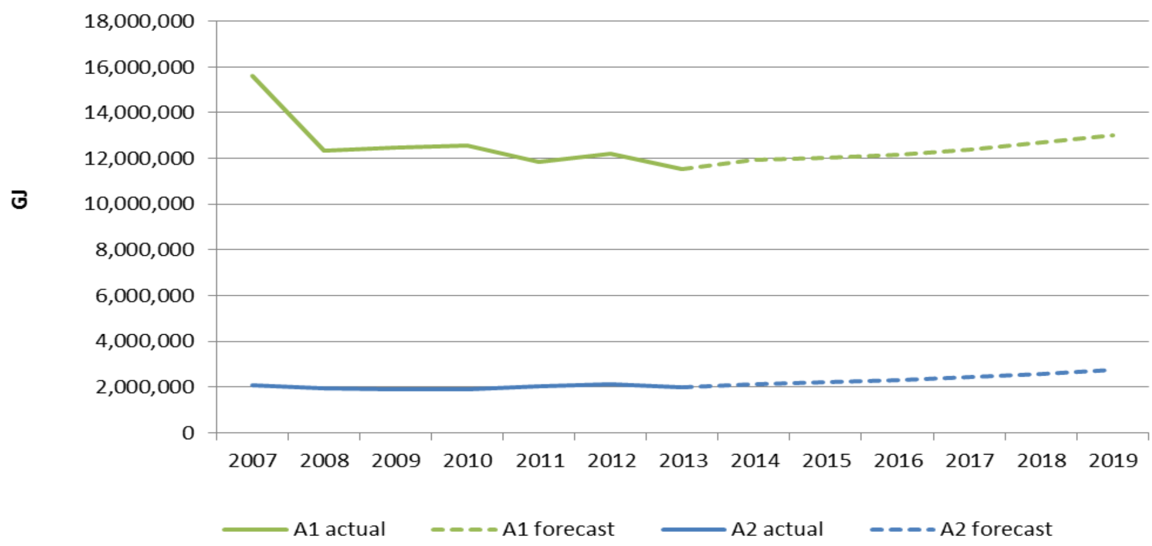


Table 8 shows forecast A1 and A2 connection numbers and demand for the AA4 period.

Table 8: Forecast connection numbers and demand for industrial customers: 2014 to 2019

A1 tariff	2014	2015	2016	2017	2018	2019	Annual average growth rate
Connection numbers	70	70	70	70	70	69	-0.3%
Demand (GJ)	11,922,065	12,029,555	12,143,688	12,370,908	12,673,841	13,008,602	1.8%
A2 tariff							
Connection numbers	112	120	126	132	138	145	5.2%
Demand (GJ)	2,103,786	2,208,644	2,315,018	2,445,268	2,593,941	2,752,930	5.5%

5.8 Overall Demand Forecast

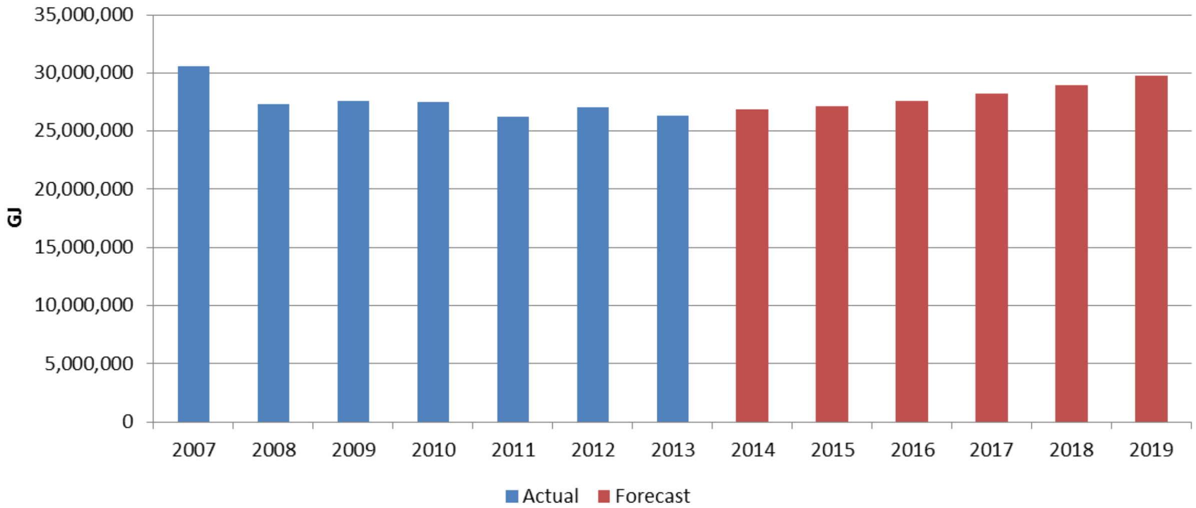
Table 9 summarises ATCO Gas Australia's overall demand forecast (connection numbers and consumption) for the AA4 period and the average annual growth rate for each tariff class.

Table 9: Overall demand and connection number forecasts 2014 to 2019

Tariff class	2014	2015	2016	2017	2018	2019	Average annual growth rate
A1 tariff							
Connection numbers	70	70	70	70	70	69	-0.29%
Demand (GJ)	11,922,065	12,029,555	12,143,688	12,370,908	12,673,841	13,008,602	1.8%
A2 tariff							
Connection numbers	112	120	126	132	138	145	5.2%
Demand (GJ)	2,103,786	2,208,644	2,315,018	2,445,268	2,593,941	2,752,930	5.5%
B1 tariff							
Connection numbers	1,410	1,468	1,528	1,589	1,652	1,717	4.0%
Demand (GJ)	1,652,379	1,667,284	1,691,685	1,729,881	1,775,516	1,823,895	2.0%
B2 tariff							
Connection numbers	9,932	10,346	10,792	11,270	11,781	12,326	4.4%
Demand (GJ)	1,194,484	1,177,612	1,169,788	1,173,334	1,183,114	1,195,512	-0.0%
B3							
Connection numbers	664,763	679,549	694,284	708,948	723,542	738,065	2.1%
Demand (GJ)	9,970,563	10,089,375	10,274,990	10,501,759	10,747,244	10,999,195	2.0%
Total							
Connection numbers	676,287	691,553	706,799	722,009	737,183	752,322	2.2%
Demand (GJ)	26,843,277	27,172,470	27,595,169	28,221,150	28,973,656	29,780,135	2.1%

Actual and forecast total consumption is presented in figure 24 below.

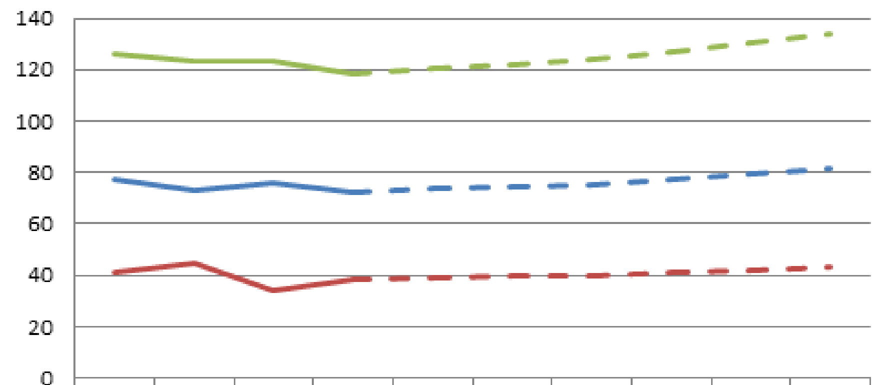
Figure 24: Historical and forecast total demand for all customers: 2007 to 2019



5.8.1 Pipeline usage

The forecast demand and connection numbers are expected to increase the minimum, average and maximum demand over the AA4 period.[44]

Figure 25: Actual and forecast demand 2010 to 2019



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Avg demand (TJ/day)	77.33	73.21	75.8	72.5	73.54	74.45	75.40	77.32	79.38	81.59
min (TJ/day)	41.37	44.85	33.96	38.19	39.02	39.50	40.00	41.02	42.12	43.29
Max (TJ/day)	126.21	123.1	123.46	118.18	120.83	122.31	123.88	127.03	130.42	134.05

[44] It is not practicable to provide pipeline utilisation for the Network as indicated in Appendix 2A.

6. Operational Expenditure

6.1 Key messages

- ATCO Gas Australia forecasts operating expenditure of $453.8[45] million during the AA4 period.
- Key drivers of the operating cost increase are:
    - Requirements of the Safety Case, leading to an increase in programmes associated with mitigating safety risks to consumers, the workforce and the public
    - An increase in workforce and support to maintain existing services and deliver additional activities, including those arising from growth in the network and customer connections and support for ongoing operational efficiencies
- Operating expenditure forecasts have been developed using a bottom-up build. The forecast approach considers past activities and costs, external cost estimates and specific activities required during the period
- Operating expenditure is split into the following categories:
    - **Corporate costs –** headquarter costs which include executive, strategic and business support functions such as human resources, finance, regulation, risk, legal, internal audit, insurance, corporate communications, treasury, and corporate secretarial
    - **Network operating costs –** costs to run the Network based on the AMP and asset class strategies designed to reduce the life cycle costs of assets whilst maximising asset performance and reducing risk to *as low as reasonably practicable* in accordance with the Safety Case
    - **Unaccounted for gas (UAFG) costs** - the cost of gas required to match the difference between the metered inputs to and outputs from the Network. These costs are driven by gas leakage, metering and measurement differences and the wholesale cost of gas
    - **IT operating costs** - are developed from the IT asset management strategy to efficiently and effectively manage the maintenance and replacement of legacy assets whilst identifying specific projects to support the growth of the business, meet Safety Case and network asset management requirements and deliver improved productivity and efficiency in network and corporate operations.
- ATCO Gas Australia compares favourably with its peers in relation to operating costs per customer and per kilometre
- ATCO Gas Australia forecasts a reduction in UAFG over the AA4 period from 2.67 per cent in 2014 to 2.6% in 2019, however the cost of UAFG may increase due to the increase in the wholesale cost of gas and the increase in network throughput arising from growth in customer connections

[45] $3.8 million of operating costs includes ancillary reference services. These services are discussed in Chapter 12.

6.2 Forecasting method

Each year, ATCO Gas Australia prepares a five-year expenditure forecast. Costs are developed as part of the business planning process and supported each year by the annual budget process. The annual budget process ensures the business manages within budget and manages required variations.

Operating costs are categorised into four main cost drivers, which are:

- Corporate costs
- Network operating costs
- UAFG
- IT costs

The method for forecasting each cost category is slightly different, but is largely based on a bottom-up assessment. In summary:

- **Corporate costs** are forecast based on each business unit identifying the resources and support required to deliver on the Network and business objectives. The costs are estimated based on previous costs and known information about changes in costs and new costs.
- **Network operating costs** are forecast by identifying the inspection, operating and maintenance activities necessary to deliver the requirements of the Safety Case[46] and AMP[47]. Costs are developed using a combination of historical unit costs, market tested rates and forecast resource requirements to deliver the reference services to the growing customer base.
- The **cost of UAFG** is forecast by applying the forecast UAFG percentage to the expected network throughput at a predicted wholesale gas price.
- **IT costs** are forecast by undertaking a review of the Network and business requirements over the period, developing the IT Strategy[48] and IT Asset Management Plan[49] to deliver these requirements. Cost estimates are based on a combination of historical costs and information about changes in costs and new costs.

The forecast operating costs are consolidated using spread sheet models. Each cost centre manager is required to approve their cost centre budget to ensure there is accountability and ownership for the information provided.

ATCO Gas Australia's most recent business planning process covered the proposed AA4 period and the current business plan budget covers the 2014 financial year (January to December 2014). The business planning process usually occurs in the third quarter of the financial year. Actual results are reported against budget on a monthly and year-to-date (YTD) basis.

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[46] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

[47] Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014.

[48] Appendix 06: ATCO Gas Australia Technology Strategy.

[49] Provided in confidential Appendix 30: ATCO Gas Australia IT AMP, March 2014.

ATCO Gas Australia has reviewed activities required to operate the Network, including obligations resulting from the Safety Case[50] and required corporate support functions. ATCO Gas Australia considers operating expenditure on these activities during the AA3 period is not at the level required to operate the Network sustainably or meet ongoing business requirements. It has therefore developed a plan for the AA4 period to address this.

Also, ATCO Gas Australia has commenced research and planning for a gas marketing strategy aimed to increase awareness of the benefits of natural gas and increase the number of connections. This strategy includes an assessment of the required increase in resources dedicated to marketing and business development as well as specific marketing campaigns and incentives to encourage the use and connection of natural gas. A plan has been developed for the AA4 period to address this increased effort.

6.3 Forecast operating expenditure summary

For AA4, ATCO Gas Australia forecasts $453.8 million[51] of operating expenditure is required to sustainably operate and maintain the business to deliver gas distribution services. This is a 30.5% increase in operating costs compared to AA3 on an annualised basis. The cost increase is driven by:

- Requirements of the Safety Case, leading to an increase in programmes associated with mitigating safety risks to consumers, the workforce and the public
- An increase in workforce and support to maintain existing services and deliver additional activities, including those arising from growth in the network and customer connections and support for ongoing operational efficiencies

Table 10 shows forecast operating costs by category for the AA4 period.

Table 10: Forecast operating cost for 2014 to 2019

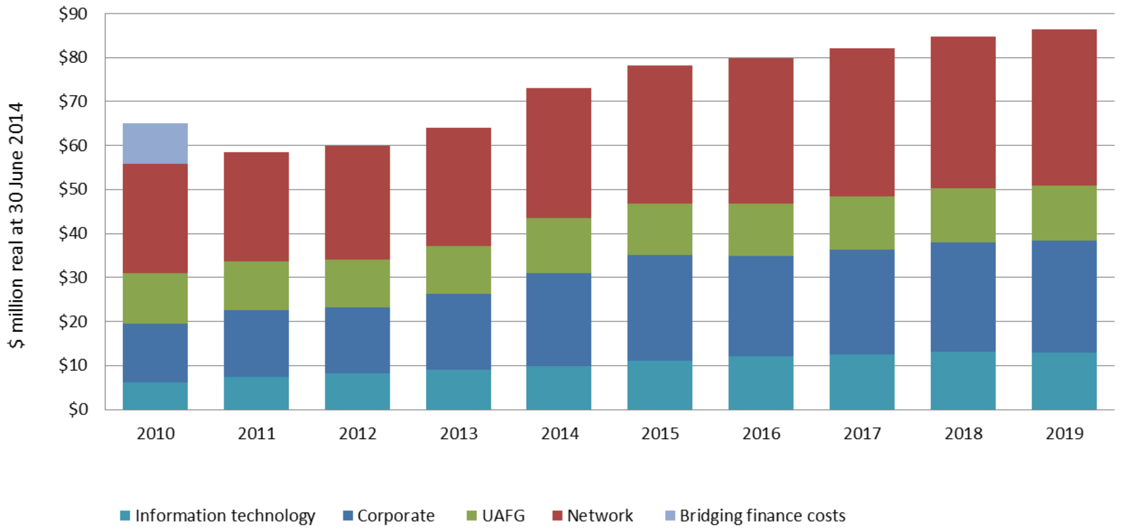
$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	TOTAL
Network	15.3	31.4	33.0	33.6	34.5	35.3	**183.1**
UAFG	6.9	11.7	12.0	12.2	12.4	12.6	**67.7**
Corporate	11.5	23.9	22.8	23.6	24.8	25.5	**132.2**
Information technology	5.3	11.1	12.1	12.6	13.1	12.9	**67.1**
Total operating expenditure	**38.9**	**78.2**	**79.8**	**82.0**	**84.8**	**86.3**	**450.0**

[50] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

[51] $3.8 million of operating costs includes ancillary reference services. These services are discussed in Chapter 12.

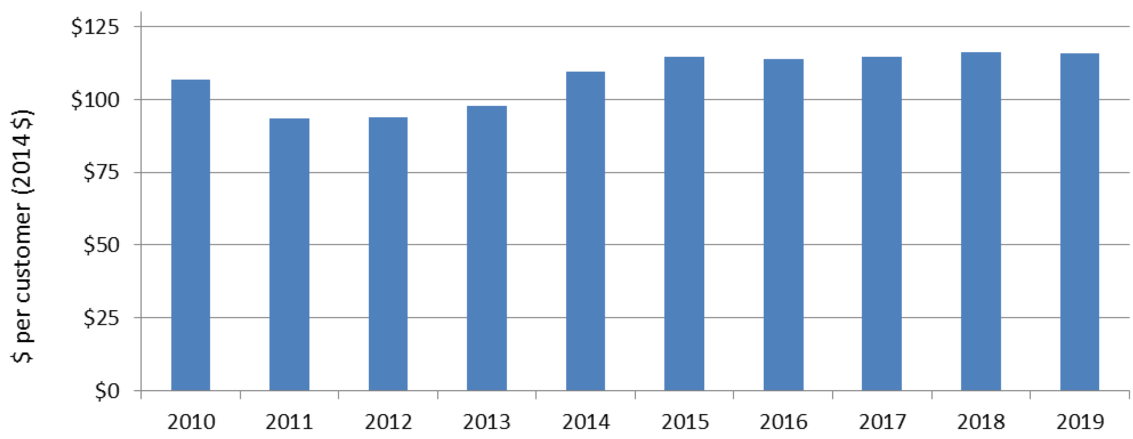
Figure 26 shows historical and forecast operating costs[52].

Figure 26: Actual and forecast operating costs 2010 to 2019



Since ATCO acquired the Network in 2011, the operating costs have increased due to the implementation of the Safety Case and the accelerated extension of the network to new areas. The increases reflect the need to increase expenditure to meet Safety Case requirements and thereby reduce the risks associated with the growing Network to as low as reasonably practicable. ATCO Gas Australia considers it will achieve a sustainable level of operating costs in 2015 and would expect operating costs per customer to stabilise in subsequent years as more customers join the Network. This movement in operating costs per customer over the period is illustrated in the chart below.

Figure 27: Operating cost per customer 2010 to 2019



[52] Operating expenditure for AA3 is provided in table form in Appendix 2A.

6.4 National Gas Rules requirements and other legislation

The National Gas Rules require that operating expenditure must be such as 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.[53]

The operating costs forecast by ATCO Gas Australia reflect those that must be incurred to comply with legislation and regulations governing the workplace, corporate reporting and tax, regulatory reporting requirements, technical, quality and safety requirements and to comply with all applicable laws.

For example, the *Gas Standards (Gas Supply and System Safety) Regulations 2000* (GSSS) establish the requirement for a Safety Case Regime which requires documentation of the process and procedures ATCO Gas Australia will employ to ensure the safe and reliable operation of the Network. The Safety Case:

- must be accepted by Energy*Safety*
- be complied with by the network operator
- be reviewed by the network operator to ensure continuous improvement on an ongoing basis, to reduce risks associated with the Network to as low as reasonably practicable.

The Safety Case drives considerable investment and activities during the remainder of AA3 and in to AA4. Revisions to the Safety Case must be submitted to Energy*Safety* during 2014. Before being able to revise the Safety Case, ATCO Gas Australia must review the formal safety assessment (FSA) of the entire Network, which will include all of the Network's materials, fittings and equipment, and associated operational practices.

A number of other legislative and regulatory changes also affect ATCO Gas Australia's costs of service, in particular:

- Significant reforms to the *Privacy Act* regarding management and disclosure of personal information and direct marketing that came into effect from March 2014
- Changes to the *Fair Work Act* affecting the rights of employees to request flexible working arrangements and from 1 January 2014, in relation to anti-bullying and right of entry
- Changes to the superannuation legislation that have resulted in an increase in the superannuation guarantee to 9.25 per cent from 1 July 2013, presently legislated to further increase to 12% by 2019
- Changes to industrial relations laws foreshadowed for 2014 by the Federal Government
- Work Health and Safety (WHS) Legislation - the State Government has indicated that during 2014 it will implement the bulk of the work place health and safety legislation already in place in all other Australian States (except Victoria) and the Commonwealth. While the Work Health and Safety (WHS) Legislation will largely replicate the same duties and responsibilities as the existing Occupational Safety and Health Act 1984 (WA), there are new requirements that will directly affect ATCO

[53] Rule 79(1)(a) NGR.

Gas Australia. The new legislation will require ATCO Gas Australia to ensure that management, employees, contractors and customers are aware of and comply with the new legislation, regulations and codes.

Only the changes to superannuation legislation outlined above have been reflected in this submission. The other legislative and regulatory changes have not been reflected in the submission as their impact on costs cannot be accurately estimated at this time.

6.5 Efficient cost comparisons with peers

ATCO Gas Australia achieves the lowest sustainable cost of delivering pipeline services by adopting competitive processes wherever possible and implementing cost effective and sound contract and project management approaches. The Procurement Policy[54] outlines ATCO Gas Australia's approach to purchasing labour, materials and advisory services. The policy is designed to maximise the value to ATCO Gas Australia when purchasing goods and services by encouraging competition in procurement processes and endeavouring to obtain goods and services at the lowest overall cost whilst maintaining minimum standards.

Another way that ATCO Gas Australia ensures its estimated and actual costs reflect the lowest sustainable cost of delivering reference services is to undertake regular reviews of the actual costs incurred compared to the estimates and review these against changes in the market. ATCO Gas Australia also compares its costs to other gas distribution network businesses to continually review efficiency and cost outcomes.

ATCO Gas Australia compares favourably to its peers on a number of comparative measures. Although ATCO Gas Australia's operating costs are forecast to rise during AA4 as a result of the increased costs necessary to support the provision of services, the cost per customer and cost per kilometre remain at the lower end of the range of comparable peers.

In 2012, Economic Insights prepared a report on efficiency performance for the three Victorian gas distribution businesses – Envestra Victoria, Multinet and SP AusNet over the period 1999-2010[55]. The report presented a range of partial productivity performance indicators to compare the operating and capital input efficiency performance of these businesses. The report included information and comparisons for ATCO Gas Australia.

For three of the four operating expenditure indicators, ATCO Gas Australia was represented in the bottom half of the 14 companies compared, performing comparatively better for operating cost per customer.[56]

ATCO Gas Australia commissioned ACIL Allen to undertake a similar benchmarking analysis with updated information in early 2014.[57] This analysis showed that compared to other utilities, ATCO Gas Australia has the lowest operating costs per kilometre and consistently the lowest or second lowest operating cost per customer. The operating expenditure plus capital expenditure per kilometre indicator continues to be the lowest of the nine distribution businesses in the sample.

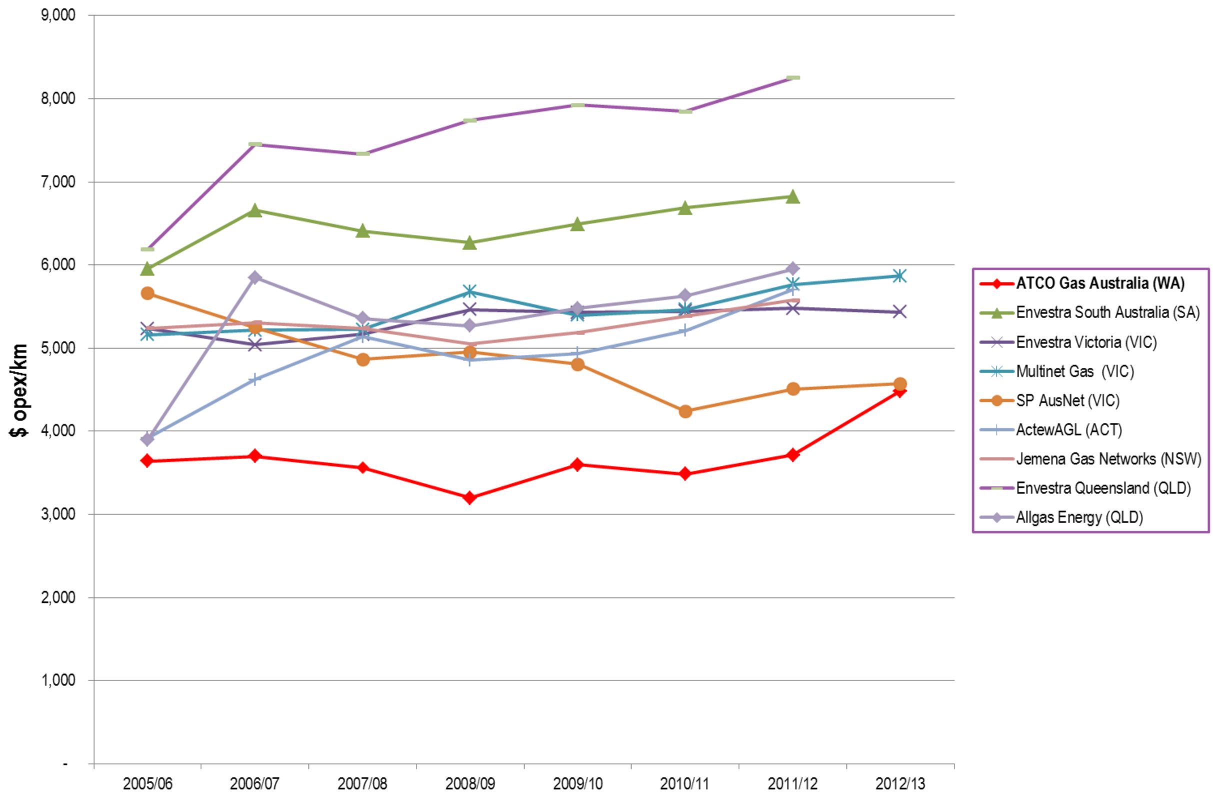
[54] Appendix 07: ATCO Gas Australia Procurement Policy, September 2012

[55] Appendix 08: Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators, Economic insights Pty Ltd, March 2012

[56] Appendix 08: Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators, Economic insights Pty Ltd, March 2012, pg 12

[57] Appendix 9: Gas Distribution Benchmarking, ACIL Allen Consulting, March 2014

Figure 28: Operating expenditure per kilometre: ACIL Allen Gas Distribution Benchmarking Report[58]



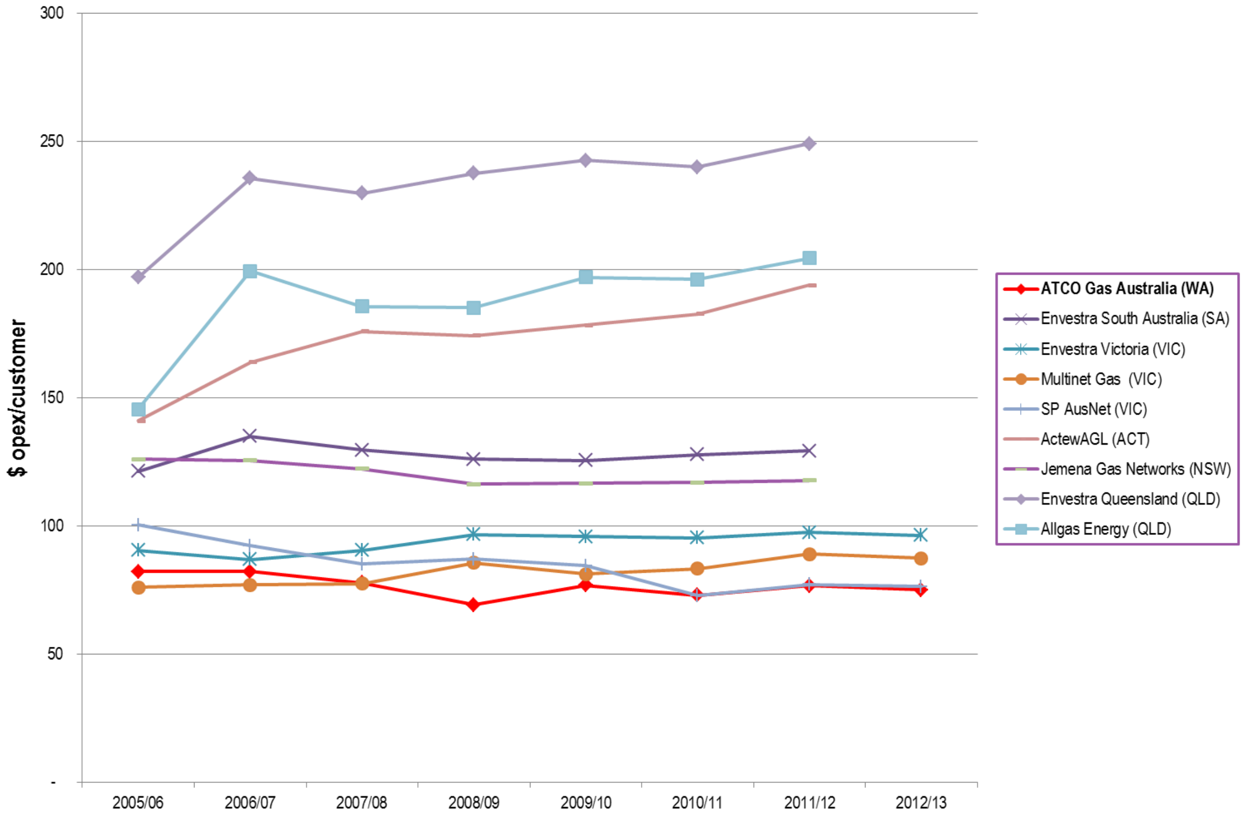
Note: Opex in $Dec 2013

ATCO Gas Australia's operating cost per kilometre increased in 2012/13 and this higher level is forecast to continue into AA4. This reflects the increased investment required to deliver a safe and reliable service and to sustainably grow the provision of services. These drivers for investment are most likely to impact on the costs per kilometre.

As is shown in the following figure 29, operating costs per customer are the lowest compared to the other gas distribution businesses. The costs per customer are forecast to increase until 2015 before achieving sustainable levels for the remainder of AA4. Despite the forecast increases, the costs per customer are expected to continue to compare favourably with other gas distribution businesses.

[58] Appendix 9: Gas Distribution Benchmarking, ACIL Allen Consulting, March 2014. Operational Expenditure included in ACIL Allen report do not include UAFG for comparison purposes.

Figure 29: Operating expenditure per customer: ACIL ALLEN Gas Distribution Benchmarking Report[59]

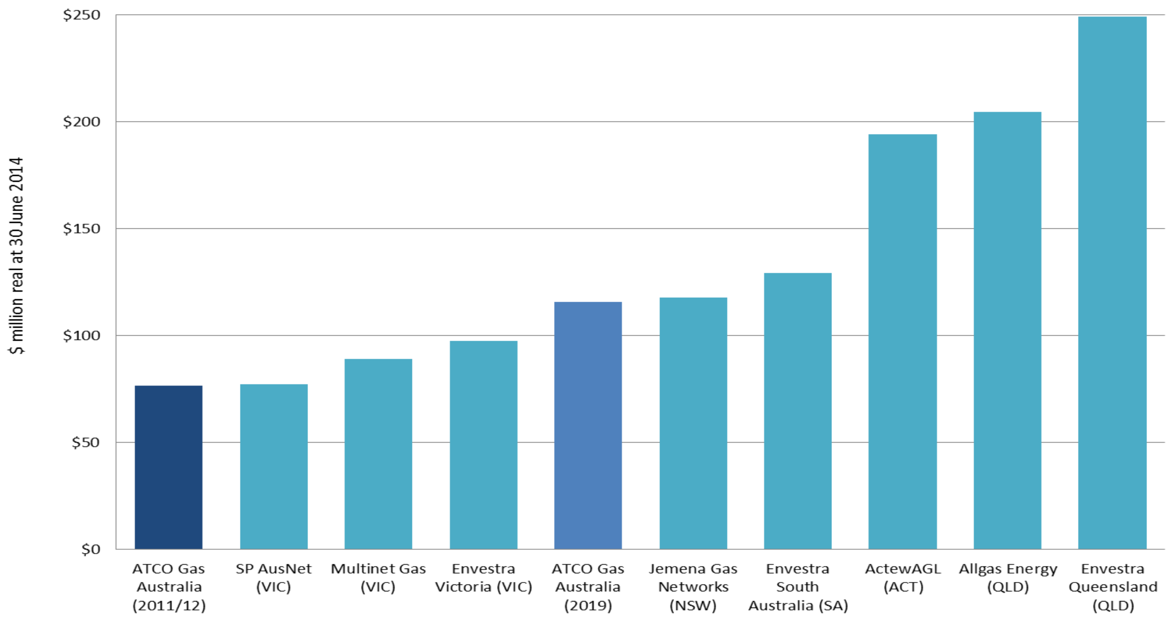


Note: Opex in $Dec 2013

To consider the impact of the forecast operating expenditure on performance compared with its peers, ATCO Gas Australia compared the data from the Economic Insights report with the forecast operating costs at the end of the AA4 period in 2019. The following chart shows that the forecast operating costs per customer at the end of the AA4 period in 2019 continue to compare favourably with other gas distribution network businesses.

[59] Appendix 9: Gas Distribution Benchmarking, ACIL Allen Consulting, March 2014.

Figure 30: Operating cost per customer benchmark



6.6 Cost escalators

Recent experience in Australia shows that many of the costs of doing business are growing faster than general price movements in the economy. In recent regulatory decisions the ERA and AER have each recognised that external factors such as the commodities boom and skill shortages have a significant impact on the efficient costs of a business. When this is the case, cost escalation at the level of the consumer price index (CPI) may not reasonably reflect realistic movements of some of the materials and labour costs faced by network service providers. Therefore, input cost escalation that might be expected above CPI are incorporated into expenditure forecasts.

ATCO Gas Australia has incorporated forecast movements in the cost of labour above CPI into expenditure forecasts but no increases above CPI for material costs. ATCO Gas Australia expects that labour costs will increase by an average additional 2% above CPI each year over the AA4 period based on an assessment of statistical analysis, market intelligence and experience and the impact of the changes to superannuation.

Table 11 sets out the forecast impact of cost escalation on operating expenditure forecasts.

Table 11: Costs associated with escalation in labour: 2014 to 2019

$ million real at June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Labour escalation	-	0.7	1.3	2.0	2.8	3.6

6.6.1 Labour cost escalation

ATCO Gas Australia has estimated increases in labour costs based on its experience and processes for achieving balanced remuneration outcomes. In forecasting labour costs ATCO Gas Australia balances statistical evidence, market intelligence and actual experience. ATCO Gas Australia's forecasts encompass all employees covered by enterprise bargaining requirements, individual contracts and awards.

Labour costs are difficult to forecast due to volatility in economic markets. ATCO Gas Australia expects this volatility to continue throughout AA4, however to a lesser degree than that experienced during the current access arrangement period. ATCO Gas Australia's labour escalation forecast is based on a qualitative process, which its Human Resources department follows annually. This process ensures remuneration levels are efficient, fair and reflect the market. The methodology incorporates the composition of ATCO Gas Australia's current and expected workforce.

ATCO Gas Australia's assessment has taken into consideration:

- The ATCO Gas Australia and Communications, Electrical and Plumbing Union (CEPU) Enterprise Agreement 2013, which operates until 31 December 2015
- Expectations in regards to the ATCO Gas Australia and CEPU Enterprise Agreement 2016
- Expected increases for salaried employees based on:
  - observed market practice
  - salary survey evidence from the HayGroup, Mercer and Ausrem
  - WA Wage Price Index (WPI) forecasts
- Legislated increases in the superannuation guarantee rate

Under the current industrial relations framework, ATCO Gas Australia has employees engaged under both union negotiated Enterprise Agreements and common law contracts. The majority of the common law contract employees are also covered by an industry or occupation specific Modern Award. Modern Awards apply to employees in the national workplace relations system and are legislated under the *Fair Work Act 2009 (Cwth).* In general terms, around a third of the workforce are employed under the Enterprise Agreement and the remaining two thirds under common law contracts.

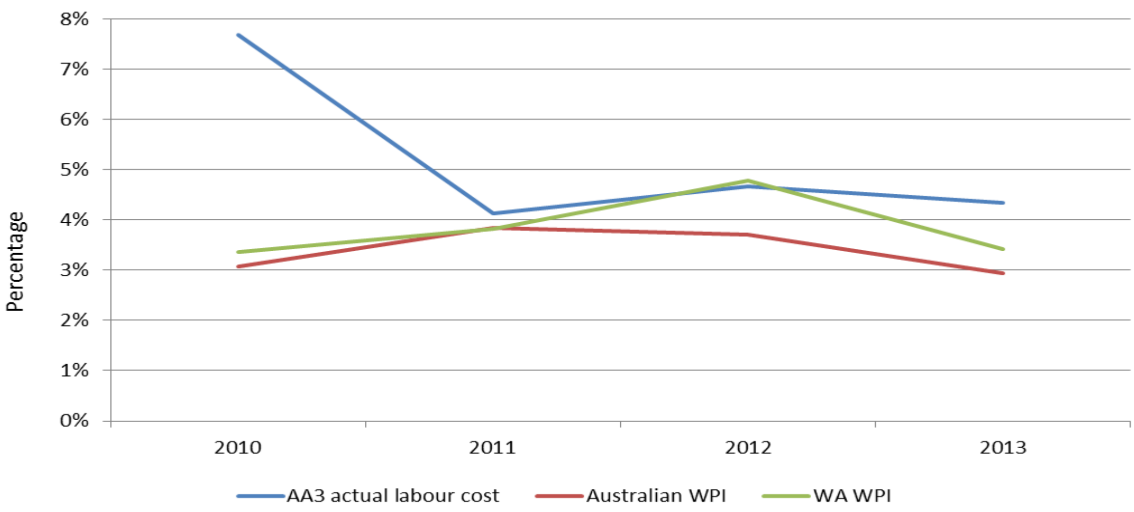
The Enterprise Agreement has historically been renegotiated every 3 years, with the current agreement due to expire on 31 December 2015. ATCO Gas Australia endeavours to renegotiate these agreements in an effective and efficient manner. During the 2012 negotiations, ATCO Gas Australia undertook a desktop review of comparative rates of pay for other gas utility organisations across Australia. This research identified that the rates for ATCO Gas Australia employees were on par with similar gas distribution businesses in Australia.

ATCO Gas Australia employees engaged under common law contracts are subject to a remuneration structure that utilises the HayGroup protocols and is supported by subscription to the PayNet Pearl salary database. Using the comprehensive market data provided through this subscription, ATCO Gas Australia targets remuneration to the midpoint of the market. Using remuneration market data gained from the HayGroup's substantive database along with general market data for Australia and WA, ATCO Gas Australia works to provide annual increases to remain in touch with the local market and to be able to continue to attract and retain quality employees, including for those positions where a skills shortage exists such as engineering and professional services. Consideration of this information ensures ATCO Gas Australia is generally able to attract and retain quality employees while still operating efficiently.

If ATCO Gas Australia is unable to remain competitive in the employment market then the identified risks and costs associated with increased turnover and increased time to recruit will be incurred. Increased turnover directly correlates to increased recruitment costs. Increased vacancy rates can result in a risk to the business of resources having to be relocated from business critical positions.

ATCO Gas Australia utilises statistical data from the Australian Bureau of Statistics (ABS), Chamber of Commerce and Industry WA (CCIWA) and Department of Treasury, such as the WA wage price index (WA WPI).[60] This statistical data is used to assist with the annual remuneration reviews and Enterprise Agreement negotiations. However, the experience over the current access arrangement has been that the actual growth in labour costs has outstripped the increases in Australian and WA wage price indices. The following graph shows the percentage change in labour costs experienced by ATCO Gas Australia during the AA3 period compared to the Australian and WA wage price indices.

Figure 31: Comparison of actual labour costs and labour indices for 2010 to 2013



As a result of the divergence between the growth in labour costs experienced by ATCO Gas Australia and observed labour price indices, forecast labour cost escalation has not relied solely on statistical forecasts. While ATCO Gas Australia has incorporated some consideration of statistical evidence into its forecast, the business has relied on market intelligence as well as labour market data and recruitment experience to arrive at labour cost escalation forecasts.

Historically, ATCO Gas Australia has been able to attract and retain quality talent by remaining up to date with market movements. However, there is a risk of having to find alternate methods of filling these positions, such as using agency personnel or consultants, all of which are much more expensive options. These alternative methods also impede the benefits derived from a permanent workforce such as the retention of knowledge and staff development.

If ATCO Gas Australia is unable to pay competitive remuneration for the field based employees required, those covered by the Enterprise Agreement, the risks to the business are significant due to the high demand for similar skills in the construction and mining industries. There is also a risk that Enterprise Agreement employees may take industrial action.

60 http://www.abs.gov.au/ausstats/abs@.nsf/mf/6345.0/

6.6.2 Superannuation

In July 2011, the Australian Government announced that the superannuation guarantee rate would be gradually increased to 12%.[61] The change was implemented to ensure that the prosperity and opportunities resulting from the commodity boom are shared amongst all Australians and to addresses issues raised by an ageing population and low private and national savings[62]. Legislated superannuation increases, as shown in the table below, have been incorporated into the forecast labour costs.

Table 12: Forecast superannuation guarantee rate

Year	Rate (%)	% increase
2013-14	9.25	0.25
2014-15	9.50	0.25
2015-16	10.00	0.50
2016-17	10.50	0.50
2017-18	11.00	0.50
2018-19	11.50	0.50
2019-20	12.00	0.50

ATCO Gas Australia has incorporated the impact of the superannuation increases, statistics and other market information to estimate the forecast labour cost escalation during AA4 at 2% above inflation in each year.

6.7 Corporate costs

ATCO Gas Australia forecasts that $132.2 million is required to support the business over the AA4 period in corporate operating costs.

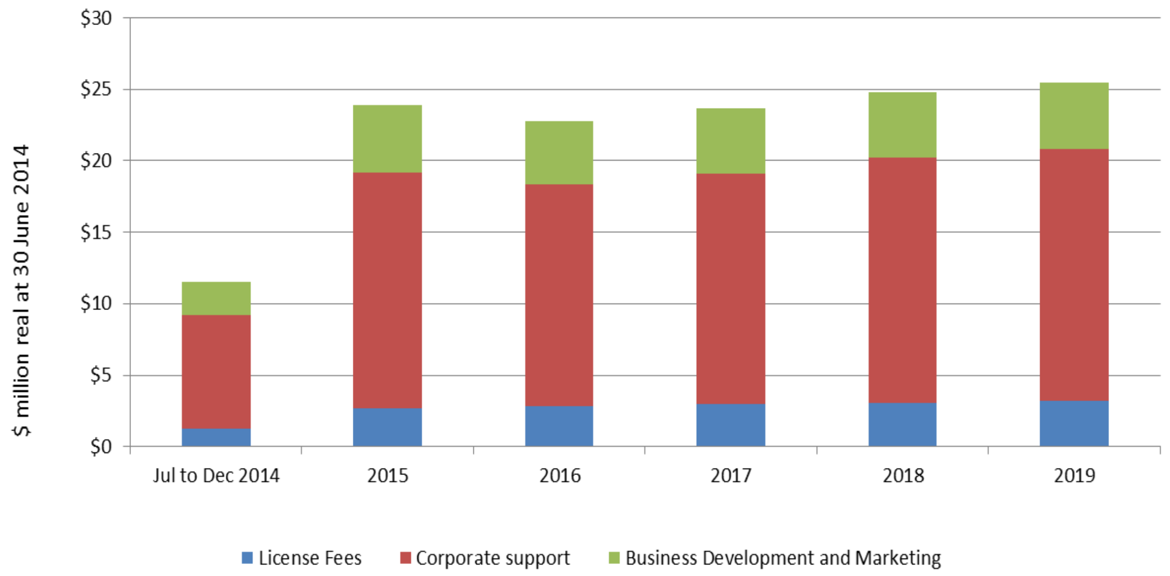
ATCO Gas Australia is proposing a significant change in its business development and marketing costs during the AA4 period. In addition, licence fees are payable by ATCO Gas Australia to government agencies and regulators. Therefore these categories of costs are discussed separately to corporate support costs. Please seesections 6.7.2 and 6.7.3 below.

Figure 32 shows the forecast corporate cost over AA4.

[61] *Superannuation Guarantee (Administration) Act 1992.*

[62] http://www.futuretax.gov.au/content/FactSheets/downloads/Fact_sheet_SG_rate_increase.pdf.

Figure 32: Actual and forecast corporate costs: 2011 to 2019



The following table presents the corporate costs by category.

Table 13: Forecast corporate operating costs for 2014 to 2019

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Corporate support costs	7.9	16.5	15.5	16.2	17.2	17.6	90.8
Business development and marketing	2.3	4.7	4.5	4.5	4.6	4.7	25.3
Licence fees	1.3	2.7	2.8	2.9	3.1	3.2	16.1
Total operating expenditure	**11.5**	**23.9**	**22.8**	**23.6**	**24.8**	**25.5**	**132.2**

6.7.1 Corporate support costs

ATCO Gas Australia forecasts corporate support costs of $90.8 million for the AA4 period. Corporate support is provided locally where the expertise and capacity exists, and from the ATCO Group otherwise. These costs cover the following corporate support functions:

- **Finance and tax** – These are the costs to manage the day to day transactional requirements of the business, manage ongoing compliance with legislation, regulations and standards and provide management with timely and accurate information. The provision of these services requires accounts payable, accounts receivable and debt collection management, financial accounting and reporting, control procedures, tax compliance, fringe benefits tax (FBT), management accounting and reporting, planning, budgeting and forecasting.

- **Human resources** - These are the costs associated with providing employee support and recruitment services, workforce planning, ensuring compliance with relevant workforce legislation and industrial relations, payroll and personnel administration, training and development support and management and performance management

- **Legal and regulatory** - Legal costs include the provision of in house general legal support across the business and the management of all external legal matters including the engagement and management of external lawyers as required. Regulatory costs are those associated with managing and reporting on compliance obligations, risk and servicing the access arrangement process including tariff variations and cost pass through processes. These costs have increased in 2013 and will again in 2014 as a result of increased requirements associated with the access arrangement revisions process.

- **Information Technology** - These are the costs associated with the development and delivery of the IT strategy and asset management plan. The function includes developing and delivering the IT strategy and IT Asset Management Plan, managing IT contracts, ensuring disaster recovery support and business continuity plan requirements, IT investment governance and managing the storage, archive and retrieval of business information. A common IT strategy across ATCO results in higher efficiency and lower costs.

- **Executive support and governance** - These are the costs associated with the President and executive support and includes the costs associated with services provided by the ATCO group of companies such as planning, strategy, treasury and debt management, tax planning and specialist tax advice.

- **Internal audit –** These are the costs associated with operational and financial audits. A robust internal audit function is important and a standard component of large organisations. Regular internal audits are necessary to review processes and activities which pose high financial or business risk.

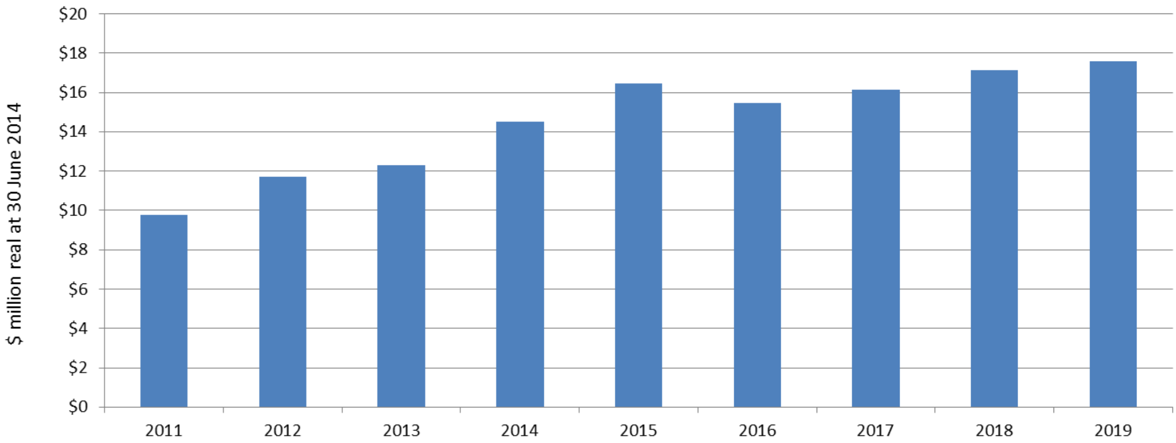
- **Insurance –** Insurance costs are those involved in managing the ATCO Group insurance programs. Insurance is of particular importance to utilities such as ATCO Gas Australia with large capital investment. The purchase of external insurance is a standard corporate practice to mitigate risk and also enables the timely repair to property and equipment in the event of damage and contributes to the delivery of reliable service.

- **Company secretarial –** The company secretarial function includes coordinating Board events and preparing the official records, minutes and resolutions of board meetings. The company secretarial function also maintains corporate documents and records, the costs related to the board of directors and general corporate maintenance. The company secretarial function also provides a formal governance structure and documentation required for a company the size of ATCO Gas Australia.

- **Corporate communications –** Corporate communication costs are for internal and external communication services, website content management, event and incident communication and information management.

The figure below presents the corporate support costs over the period 2011 to 2019.

Figure 33: Corporate support costs 2011 to 2019



Corporate support costs have been increasing since 2011. Corporate support costs during the periods prior to acquisition were less than required to maintain the full provision of corporate services ATCO Gas Australia believes are required to support the forecast growth of the network and customer base over the AA4 period. The key drivers for this difference are explained below. Corporate support costs over the AA4 period will increase in 2014 and 2015 and then remain relatively steady. The key drivers for the increases in corporate costs are Access Arrangement costs and intercompany support costs:

- Access Arrangement costs -These costs have increased in 2014 and are forecast to increase again in 2015 as a result of increased requirements associated with the Access Arrangement revisions process. These costs are forecast to decrease in 2016 and increase again in 2018, in line with the timing of ATCO Gas Australia's next Access Arrangement revision submissions due at the end of AA4 in 2019.

- Intercompany Support costs- These charges are for the provision of resources that support the portfolio of assets owned by ATCO (including ATCO Gas Australia) and provide the benefit of access to in-house expertise and economies of scale in accessing the skills and information from those resources. ATCO provides ATCO Gas Australia with access to highly skilled shared executive and corporate resources, providing strategic advice, corporate and executive management, governance (including compliance and internal audit), insurance, capital markets, tax, finance and treasury functions. ATCO also has a detailed and rigorous compliance and governance structure with substantial performance reporting and monitoring and governance requirements. It is cost effective to access a share of these experienced highly skilled resources rather than seek to directly employ them. The current intercompany support arrangements are substantially broader in scope and scale to those in place under prior ownership of ATCO Gas Australia. This reflects the significant changes to the process of review, compliance and governance required by ATCO.

The corporate costs associated with services provided by the ATCO Group include strategic business advisory services (including IT and HR), company secretarial, corporate communications, insurance, internal audit, corporate governance, treasury and debt management, tax planning and specialist tax advice. These costs are of two types.

1. Direct costs – those incurred by ATCO directly on behalf of an entity, where these costs are allocated directly to the entity receiving the benefit of the services.

2. General and public costs – those which benefit the totality of the businesses within the ATCO Group, including its Australian businesses, and in particular, ATCO Gas Australia. These costs are allocated based on a simple average of each company's total assets, percentage of revenue and total labour cost. This allocation model is referred to as the Massachusetts method.

To allow time for a proper assessment of the intercompany support costs required to support ATCO Gas Australia, ATCO initially applied the intercompany support cost methodology approved in AA3 from acquisition, and assessed the costs required to support ATCO Gas Australia over the first year of operation from July 2011 to June 2012. The assessment of ATCO Gas Australia's requirement for corporate services was completed in June 2012 during the 2013 business planning process, but the updated intercompany corporate costs were only charged to ATCO Gas Australia from January 2013.

The level of the ATCO executive and corporate services resources accessed and used by each company generally correlates to the size and growth of the operation (total assets), total turnover (revenue) and workforce size and cost (total labour). ATCO applies the Massachusetts method to allocate corporate costs across all of it utility businesses[63].

The American Gas Association defines the "Massachusetts method" as;

> *A method used to allocate costs incurred by a parent company on behalf of its affiliates to those affiliates. The "Mass Formula" has three parts using the allocation factors (ratios comparing the affiliate to the company as a whole) of gross plant, gross revenues, and labor, which are added together and then divided by three to arrive at a simple average of the three factors. This formula attempts to weight various aspects of each of the affiliates so that a fair distribution of the overhead cost is allocated*[64]

6.7.2 **Licence fees**

ATCO Gas Australia is required to pay $16.1 million in licence fees to the following agencies and departments as a requirement of operating the Network:

- Energy*Safety*
- Economic Regulation Authority
- Energy Industry Ombudsman
- Retail Energy Market Company (REMCo)
- Department of the Mines and Petroleum
- Office of the Gas Disputes Arbitrator

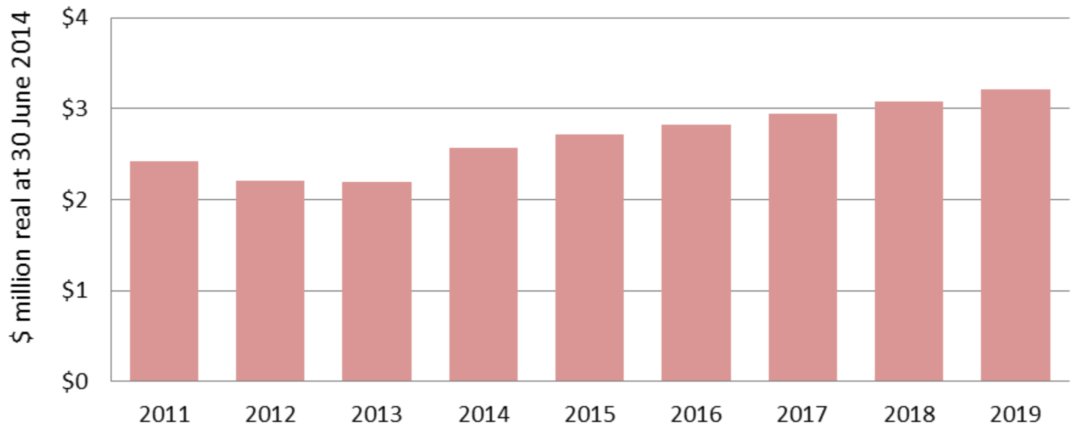
[63] The use of the Massachusetts method has been approved by the Alberta Utilities Commission (AUC) and is applied across all ATCO utility businesses. Specifically, in approving the use of the Massachusetts method for the purpose of allocating corporate costs, the AUCs decision must result in rates and a tariff that are just and reasonable under the Gas Utilities Act of Alberta, Canada.

[64] http://www.aga.org/Kc/glossary/Pages/M.aspx

- Department of Regional Development and Lands

These costs are not able to be managed by ATCO Gas Australia, Therefore it is proposed they remain as a pass through cost so that where the costs increase, ATCO Gas Australia can recover the increase and where the costs decrease, customers only pay the reduced amount. Figure 34 shows the actual and forecast licence fee costs.

Figure 34: Actual and forecast licence fees 2011 to 2019



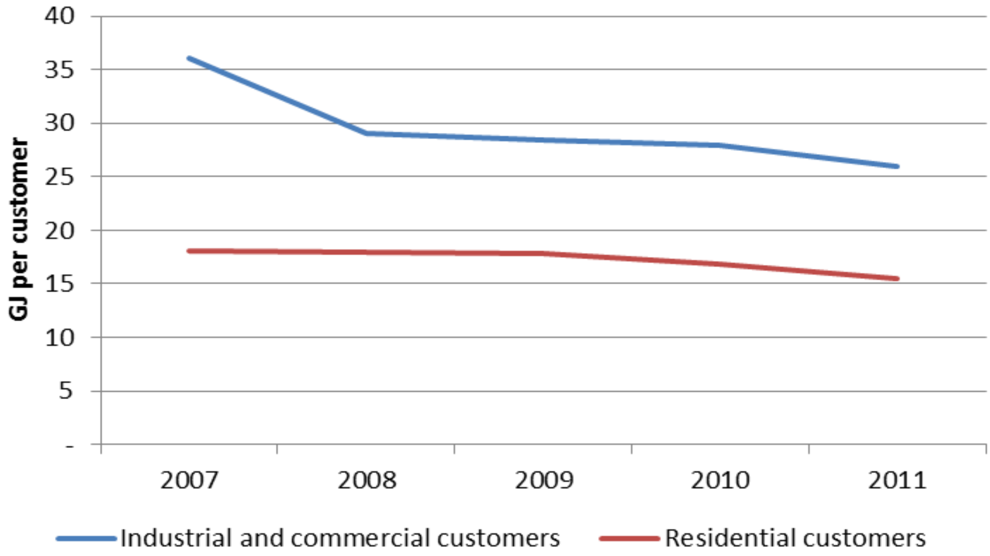
6.7.3 Business development and marketing

ATCO Gas Australia will spend $25.3 million in business development and marketing costs over the AA4 period. These costs will cover the following functions:

- Develop and execute initiatives to grow connection and throughput growth
- Commercial management
- Business case development and evaluation
- Stakeholder relationship development and management with retailers, builders, commercial, residential land developers and customers

These costs over the AA4 period are required to execute ATCO Gas Australia's strategy to grow the use of the Network in response to an observed decline in the average consumption per customer (see Figure 35) and only marginal growth rates in new connections.

Figure 35: Consumption per connection 2007 to 2011



If consumption per connection continues to decline and growth in new connections remains slow, the cost per connection is likely to rise over time thereby further dampening demand. In 2012, ATCO Gas Australia reviewed the state of the market and identified opportunities to grow consumption and customer numbers such that this would reduce the costs to customers over time improving the competitiveness of gas as a fuel source.

(a) Addressing declining consumption

ATCO Gas Australia recognises the difficulty of increasing connections and consumption in Western Australia compared to other Australian gas distribution networks primarily due to the mild to hot climate. This has led to housing design and consumer sentiment tending towards cooling appliances rather than space heating. The desirability of reverse cycle air-conditioning together with subsidised electricity tariffs increases the challenge of growing consumption of existing and new residential customers based on gas appliances that predominantly generate heat. There has been a rise in the penetration rate of reverse cycle air conditioners to over 90%[65] of homes in Western Australia.

The decline in gas consumption in residential homes has been further compounded by the energy efficient building code requirements for new home construction. These requirements penalise homes for including venting for unflued gas space heaters, as these vents break the thermal seal of the room.[66] New home builders wishing to promote housing designs that meet these new requirements, often elect to remove the unflued gas bayonet point from homes to avoid the need for venting and maximise the energy efficiency rating. The removed bayonet points are rarely replaced with a flued natural gas alternative due to the higher price of the flued alternative.

In addition, gas faces competition from other energy forms such as solar hot water systems and photovoltaic cells. The impact of this decline is most apparent in new homes.

To address declining consumption, in 2012 ATCO Gas Australia conducted research and planning for a gas marketing strategy that aimed to increase awareness of the benefits of

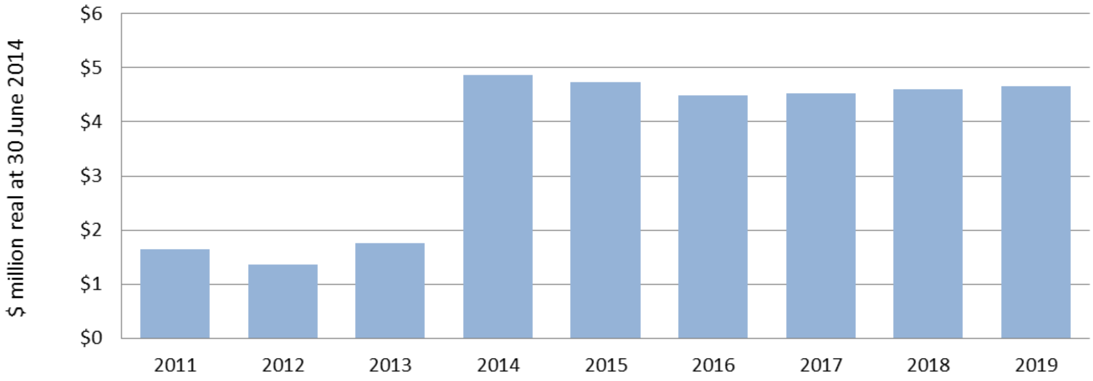
[65] Australia Bureau of Statistics, 4602055001DO01_201103 Environmental Issues: Energy Use and Conservation, Mar 2011, Table 15 Whether Cooling Used, 24 October 2011.

[66] Appendix 04: Gas Demand Forecast, Core Energy Group, January 2014.

natural gas and increase the number of connections. This strategy included an increase in resources dedicated to marketing and business development as well as specific marketing campaigns and incentive initiatives to encourage the use of and connection to natural gas. This strategy commenced in mid-2013 and will continue into AA4. The programme delivers a positive net present value and therefore is expected to lower prices to all customers over time.

Figure 36 shows forecast and actual business development and marketing costs.

Figure 36: Actual and forecast business development and marketing costs 2011 to 2019



ATCO Gas Australia has compared the cost of its proposed marketing and development programme with other Australian gas distribution networks. ATCO Gas Australia's proposed marketing and development costs are significantly lower than the comparison businesses and will continue to be the lowest with the increased level of expenditure. Table 14 below illustrates that:

- ATCO Gas Australia's current marketing expenditure falls below the industry average; and
- ATCO Gas Australia's forecast marketing expenditure falls within the industry average

Table 14: Marketing expenditure of Australian regulated gas distribution businesses

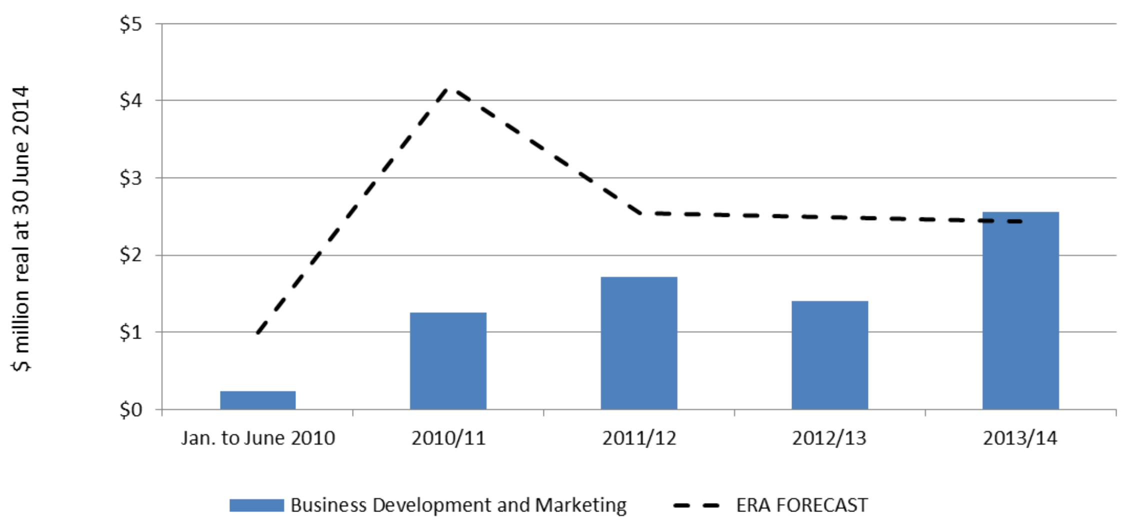
Company	State	Total Customers	Annual ($m)	Total over 5 years ($M)	% of Total Annual Revenue	Marketing $ per customer
Envestra	QLD	85,000	$2.50	$12.50	3.7%	$29.41
Envestra	SA	410,000	$7.10	$35.50	3.2%	$17.32
Envestra	Vic	570,000	$3.40	$17.20	1.9%	$5.96
ATCO Gas Australia (AA4)	*WA*	*670,000*	*$3.60*	*$18.00*	*1.6%*	*$5.37*
Jemena	NSW	1,100,000	$6.70	$33.50	1.5%	$6.09
APT Allgas	QLD	90,000	$1.10	$5.50	1.5%	$12.22
ATCO Gas Australia (AA3)	*WA*	*~620,000*	*$1.50*	*$6.00*	*1.0%*	*$2.42*
ActewAGL	ACT	250,000	$1.40	$6.70	0.5%	$5.60

(b) A gap in the market

The initial years of AA3 were impacted by two corporate transactions which interrupted the proposed marketing initiatives, the first being the internalisation of the Network business from its former organisational structure under prior ownership in August 2010, and the second being the acquisition of the Network business by ATCO in July 2011. These transactions prompted caution and reduced expenditure during both the sale process period by the prior owners of the Network business, and subsequently by ATCO as the new owners of the Network business, while an assessment was made of the requirements of the Network business by ATCO.

Figure 37 presents forecast and actual expenditure on marketing and business development during AA3.

Figure 37: ERA forecast and actual expenditure during 2010 to 2014



After ATCO acquired the Network, a comprehensive strategic marketing review (Marketing Review) was undertaken by ATCO Gas Australia, which identified the need for a marketing and business development programme. ATCO Gas Australia started implementing the key recommendations from the Marketing Review in 2013 by establishing a dedicated team to progress the marketing efforts further.

With the establishment of a dedicated team, the overall marketing plan was reshaped to focus initiatives and activities towards the residential market through targeting growth of connections and consumption on the Network. ATCO Gas Australia has identified and committed to a number of marketing initiatives, which will continue in AA4.

The Marketing Review undertaken by ATCO Gas Australia also identified that there has been very little activity in relation to marketing the benefits and use of natural gas in Perth. The recent introduction of a new gas retailer into the Perth market in March 2013 has generated a degree of marketing across different media (including TV, radio, print, online) to support the new entrant’s brand and proposition to customers. However, the focus of this offering has been to seek to persuade customers to switch between retailers, rather than attract new gas customers to the Network. For example, the campaigns by the two Western Australian gas retailers have each included offers of discounts to incentivise customers to switch retailers rather than focus on the promotion of new connections.

ATCO Gas Australia is well positioned and suitably incentivised via the regulatory regime to advocate for increased gas connections and consumption and the long term benefits that such increases will bring to customers through lower prices. Unlike Western Australian energy retailers (electricity retailers and gas retailers), as the Network operator, ATCO Gas Australia can focus on growing the gas market independent of the impact on electricity usage. Retailers in the Western Australian energy market offer multiple energy related products and may be less motivated to promote the use of reticulated natural gas where it may be a substitute for electricity use, particularly where the revenue to be earned from gas use is lower than electricity.

(c) Benefits to customers

The marketing and business development strategy will benefit customers by delivering lower prices over the long term. Despite the initial additional costs incurred, the net present value to customers is positive over a 15 year period. The value will be returned to customers over time through lower prices as the higher connections and consumption reduce the overall unit costs for each customer.

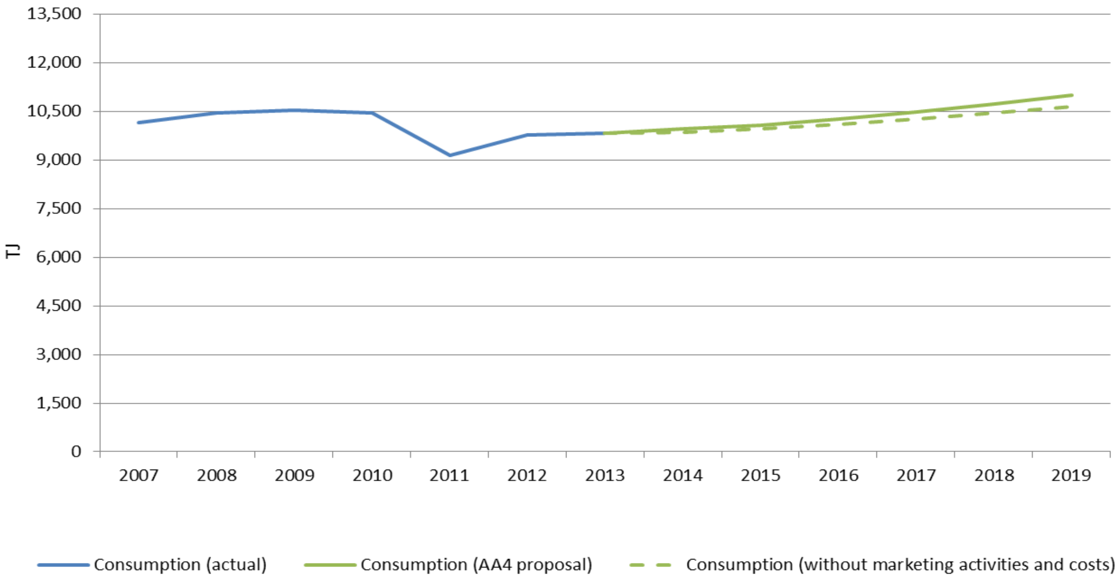
ATCO Gas Australia’s economic analysis is based on identifying for each activity and initiative the likely increase in connections and consumption. The costs of the activities (and connection) are then subtracted from the additional revenue to be recovered. The contribution of the new connections and additional consumption to revenue reduces the amount to be recovered from all other customers.

The additional connections and consumption is expected to contribute revenue of $9.7 million over the 15 years – directly offsetting the contribution from other customers. ATCO Gas Australia forecasts $5.6 million will be generated from additional residential customers resulting in reduced tariffs overall to B3 reference tariff customers.

A 15-year life has been used to ensure that the results provided a conservative estimate. Usually a 30-year life is used for connection assets. ATCO Gas Australia has adopted a conservative position by using the expected life of the main gas appliance, i.e. a hot water system, rather than the actual life of the meter and gas service. This economic life of a hot water system is 15 years. This has been used as it is at this point that the customer is most likely to make a choice to switch appliances.

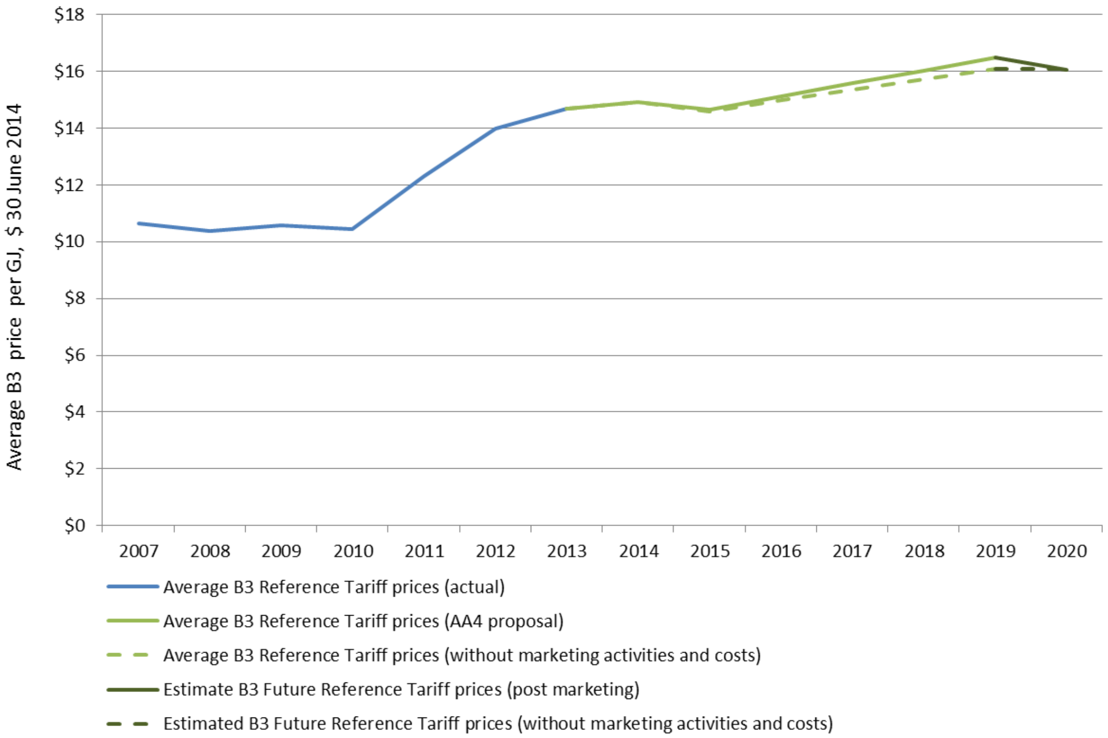
Figure 38 shows the forecast impact on consumption of the additional marketing and business development activities to be undertaken during the AA4 period.

Figure 38: B3 Reference Tariff customer consumption with and without marketing and business development initiatives: 2007 to 2019



ATCO Gas Australia's proposed reference tariffs for the AA4 period incorporate the impact of the additional marketing and business development costs as well as the expected revenue from the additional connections and increased consumption. If ATCO Gas Australia did not undertake this programme, prices would be higher over the period (see Figure 39).

Figure 39: Price per GJ to an average B3 Reference Tariff customer (15 GJ) with and without marketing activities and costs: 2007 to 2019



(d) Business development and marketing programme

ATCO Gas Australia conducted targeted market research with consumers in order to shape the proposed marketing plan and activities. The market research utilised a number of focus groups across a broad segment of the Western Australian community. The research identified that due to limited messaging in the market place on natural gas there are misperceptions in relation to the value of gas, its availability and benefits. Further, awareness of the financial savings available from substituting electricity or LPG for natural gas use was limited.

This research has allowed ATCO Gas Australia to tailor marketing and advertising material so that it provides information on the cost savings that are available to customers from having a gas appliance compared to equivalent alternatives. This comparison was based on the annual running cost of an appliance for an average use customer thus allowing the individual customer to better understand what it may mean to them.

Furthermore in response to the feedback regarding inhibitors to switching to natural gas appliances, ATCO Gas Australia has adjusted the structure of the initial campaigns to streamline the process for the customer and provide a rebate as an incentive to switch to natural gas.

ATCO Gas Australia has undertaken a pilot direct marketing programme to the end use customer during 2013. This programme provided valuable insight and experience to incorporate in the marketing programme proposed for the AA4 period. The pilot programme provided incentives to home owners in the Capricorn Estate in Yanchep to convert to natural gas. The campaign provided information about the benefits of natural gas compared to alternatives such as bottled LPG, or equivalent electric appliances. The campaign provided indicative savings from switching to natural gas and included a rebate on the connection and conversion costs.

The pilot campaign to the Capricorn Estate comprised 600 established homes that were not connected to recently commissioned reticulated gas mains. The campaign generated significant interest from these potential customers with over 250 homes arranging for quotations to have their homes converted to natural gas. Of these 250 homes, 195 homes agreed to proceed and have claimed the accompanying $1000 rebate. The remaining 55 homes cited concerns over reinstatement of homes and gardens as well as the overall costs (after the rebate) as reasons for not proceeding. In addition to the established homes, there were 85 new homes built during the campaign that have also connected to gas.

The approach adopted in Capricorn/Yanchep provided positive results and this approach is proposed to be adopted in a range of targeted regions, including infill areas across Perth and new regional developments.

(e) Marketing and business development initiatives during AA4

ATCO Gas Australia intends to conduct a targeted marketing plan during AA4 that will endeavour to increase both the connections to the Network, as well as the overall levels of consumption . This will be achieved by:

- Raising awareness of the benefits of using natural as through communication
- Generating interest in the benefits of using natural gas through education
- Encouraging connection to the Network through education and appropriate incentives, including financial incentives

The key activities contributing to the cost of this programme include:

- Conducting a rolling localised connection programme that will include incentives and financial incentives such as rebates, trade-ins or interest-free repayment options. This will help to provide customers with the facilities to switch to natural gas appliances and encourage potential customers to connect to the Network
- Establishing an Appliance Demonstration and Education Centre in the ATCO Gas Blue Flame Kitchen that will:
    - Support and aid the marketing of natural gas connections to Western Australians through the showcasing of modern natural gas appliances integrated into the Western Australian lifestyle
    - Provide a venue for ATCO Gas Australia to educate key decision makers (for example home builders, architects, developers), in a hands-on and demonstrative way, about the benefits and uses of natural gas in Western Australian households and businesses
    - Provide a venue and platform for educating customers and school age children on the safe, effective and efficient use of natural gas
    - Provide an innovative, unique and engaging way to deliver additional safety messages to natural gas customers and the public as required by Energy*Safety*
- Supporting innovation in natural gas appliance technology through early adoption of high potential gas appliances such as gas powered air conditioning and compressed natural gas for vehicles, and providing effective showcases of the technology to potential customers within Western Australia

- Establishing a gas information centre to educate consumers on the benefits, safe use, and how to get connected to natural gas. Primarily this will be via online platforms and will also include social media

(f) Basis of forecasts

ATCO Gas Australia is using the lowest cost channels to conduct the initial marketing activity but as the programme develops and expands, it will use larger broadcast media to convey the messaging to a broader audience.

The development of the forecast marketing operating expenditure has been based on best estimates projected from costs associated with current activities. For all new activities ATCO Gas Australia has sought quotes from industry representatives.

Evidence from the market research exercise provided insight that the size of any gas appliance rebate would need to be sufficient in order to motivate a customer to at least “consider” switching. ATCO Gas Australia also assessed the potential likelihood of these customers actually connecting to derive the total connections resulting from the marketing campaign and the forecast incentive expenditure.

Proposed incentives in the marketing scheme were set based on the consumer research and an assessment of the NPV of the new connection. Forecast total rebate costs are based on assumptions about the likely success rate for connection and claims for rebates. Rebates of $250 per connection have been offered to customers and $500 to builders.

Table 15 shows forecast operating costs associated with marketing and business development activities proposed for AA4.

Table 15: Forecast marketing and business development initiative costs 2014 to 2019

$ million nominal at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Advertising and promotions	0.8	1.5	1.6	1.6	1.6	1.6	8.8
Incentives	0.6	1.0	0.8	0.8	0.8	0.8	4.6
Appliance demonstration and education	0.4	0.8	0.8	1.1	0.8	1.1	5.0
Strategy and innovation	0.2	0.5	0.5	0.5	0.5	0.5	2.5
Website and social media	0.1	0.2	0.1	0.1	0.1	0.1	0.6
Total	**2.1**	**4.0**	**3.7**	**4.0**	**3.7**	**4.1**	**21.6**

The forecast new connections and consumption assumed as a result of these activities is presented in Table 16.

Table 16: New connections and consumption expected from the marketing and business development initiatives 2014 to 2019

	July to Dec 2014	2015	2016	2017	2018	2019	Total
New Connections	781	1,439	1,287	1,244	1,244	1,244	7,239
Consumption (TJ)	50.0	114.2	144.1	175.9	208.3	240.7	933.2

(g) Target audience

A number of factors influence an end use customer's choice of whether to install a gas appliance during the construction of a new home. In order for the customer to have a real opportunity to make informed choices about the benefits of natural gas appliances over other options, it is important that decision makers, such as builders and appliance retailers, are attuned to and up to date with the latest developments in the technology and the benefits of the uses of natural gas. With such information available to them, these decision makers will then be in a position to promote the use of natural gas to their own customers and investors. If this is done successfully, it will ultimately deliver an increase in natural gas uptake and consumption.

The target audience of these activities will be:

- **Residential customers** – Residential customers are the main focus of ATCO Gas Australia's Marketing Plan. This is a strategic shift from the focus of ATCO Gas Australia's predecessors who concentrated primarily on the development of cost effective commercial and industrial technologies for residential use. ATCO Gas Australia will focus on educating and informing residential customers on gas safety and the ways in which they can lower the overall cost of their gas service. This will be achieved by highlighting the environmental, safety and cost benefits of gas, explanations of key Network activities, such as how meters are read, leaks repaired, dial before you dig queries managed, and clarity about who - ATCO or their natural gas retailer - the customer should be calling. ATCO Gas Australia believes that increased marketing activity of this kind at a residential level is the most direct way to achieve effective and efficient reduction in costs to customers.

- **Land developers** – The most cost effective way of allowing new customers to connect to the Network is to construct the gas mains infrastructure as new land releases are developed. Land developers therefore need to be aware of the services offered by ATCO Gas Australia and how best to take advantage of them to ensure minimal costs and maximum benefits delivered to customers.

- **Builders –** For builders to assist their customers to be able to connect to natural gas and install natural gas appliances, they need to know about the availability and benefits of both natural gas and appliances that use natural gas. They must also be educated and informed to assist in the efficient selection and placement of gas appliances and meters to ensure minimal costs and maximum benefits to the customer.

- **Commercial and industrial** – ATCO Gas Australia has continued research into new technology started in prior Access Arrangement periods.[67] ATCO Gas Australia

[67] ATCO Gas Australia has continued research into the following areas: gas fired reverse cycle air conditioning, natural gas fuelled vehicles, micro-turbine combined heat and power systems for domestic use, fuel cell combined heat and power systems for domestic use, and cogeneration and tri-generation systems for commercial and industrial use.

believes that efficiency in building usage and environmental benefits will be reaped by commercial and industrial users if they are educated and informed about the benefits of new gas technologies that can be incorporated into new buildings, or retrofitted into existing buildings.

6.8 Network costs

ATCO Gas Australia will spend $183.1 million to operate and maintain the Network over the AA4 period. Network operating costs are recorded against the following subcategories:

- Variable volume network maintenance
- Network maintenance projects
- Network maintenance
- Network control
- Network operations support
- Network construction

Table 17 shows the forecast for each category of network operating costs for the AA4 period.

Table 17: Forecast network operating costs by category: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Network Maintenance – Variable Volume	4.4	8.5	8.8	9.4	9.6	9.8	50.5
Network Maintenance – Projects	1.0	2.1	1.9	1.9	1.8	2.1	10.9
Network Maintenance	3.0	6.6	7.8	7.6	8.1	8.5	41.6
Network Control	2.6	5.3	5.5	5.6	5.8	6.0	30.8
Network Operations Support	3.6	8.0	8.1	8.3	8.4	8.5	44.8
Network Construction	0.4	0.8	0.8	0.8	0.8	0.8	4.4
Network Total	**15.0**	**31.3**	**32.9**	**33.6**	**34.5**	**35.7**	**183.1**

The most significant impact on network operating costs has been the finalisation and implementation of the Safety Case.[68] ATCO Gas Australia operates and maintains the Network in accordance with regulations and legislation in relation to gas standards, occupational safety and health and ATCO Gas Australia's gas distribution licence.

The regulations require that a Safety Case is in place to document the processes and procedures employed to ensure the safe and reliable operation of the Network. ATCO Gas Australia is required to document and demonstrate compliance with the Safety Case as well as review its approach on an ongoing basis.

Energy*Safety* requires ATCO Gas Australia to submit a revision to the Safety Case during 2014. This will require a full review of the network formal safety assessment (FSA) which is likely to be extended to include all materials, fittings and equipment in use on the network

[68] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

along with the associated operational practices. ATCO Gas Australia is expecting to work closely with Energy*Safety* in finalising the review. The Safety Case and its implementation is routinely audited by Energy*Safety*.[69]

The implementation of the Safety Case, which underpins the Asset Management Plan and associated programmes of work, has driven and continues to drive an increase in both ‘one-off costs’ and ‘new recurring costs’. These are described in detail in the following sections.

Network infrastructure requirements for resources are annually reviewed and are based on operational activities, works programme and network growth identified in the ATCO Gas Australia Asset Management Plan (AMP)[70], which is aligned to the AA4 period. In completing the review ATCO Gas Australia identifies:

- plans to address current and emerging issues impacting operational and project delivery
- opportunities for enhancing delivery of projects and operational activities for a safe, reliable, cost efficient, environmentally sensitive and customer focused gas service

Operational activities and works programmes are delivered using a combination of ATCO Gas Australia’s internal workforce, external suppliers and contractors (including sub-contractors) to ensure that efficient and lowest sustainable cost activities, projects and work programme resources are maintained over the long term.

ATCO Gas Australia ensures its processes are effective and efficient by maintaining a Health, Safety, Environment and Quality (HSEQ) management system certified to AS/NZ 4801 (Safety Management Systems), ISO 9001 (Quality Management Standard) and ISO 14001 (Environmental Management Standard). This system is subject to an annual auditing programme, both internally and externally, to ensure compliance and is continually reviewed and improved.

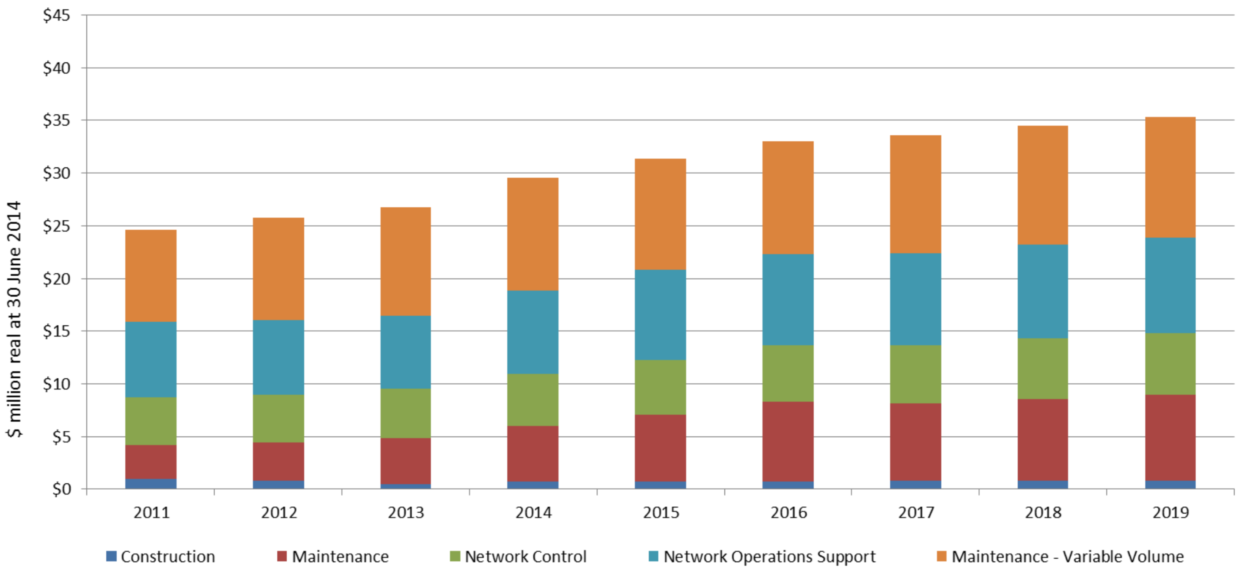
Projected network growth and requirements of the Safety Case have been used to inform and develop operational plans and programmes in the AMP and AA4 forecast operating costs. The activities required are then identified on the basis of historical activity levels and expectation of additional activities associated with the Safety Case requirements. The resourcing requirements are then assessed based on the activity levels and timing requirements and incorporated into the works programme development.

Figure 40 shows the forecast network operating costs compared to the historical network operating costs.

[69] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

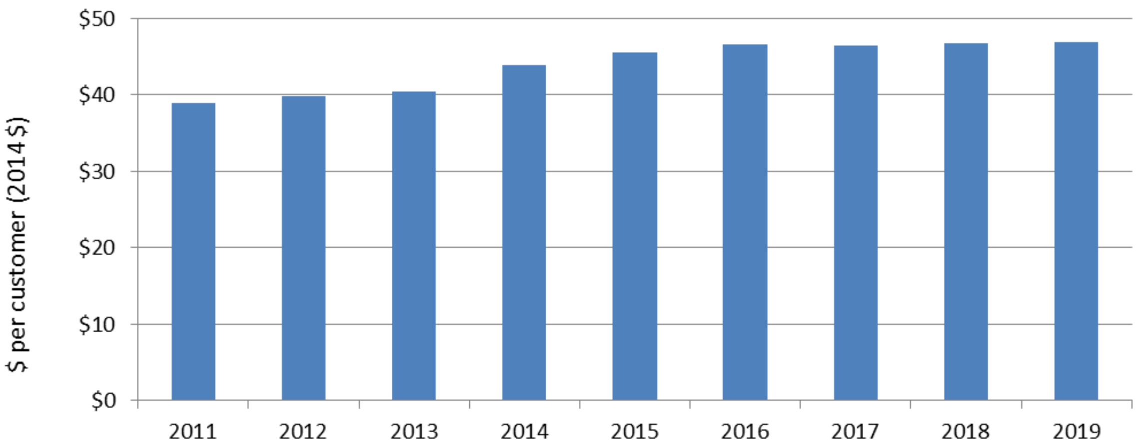
[70] Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014.

Figure 40: Actual and forecast network operating costs: 2011 to 2019



The increase in one off and new recurring costs is required to ensure the Network is reliable and reduce Network risks to as low as reasonably practicable. Network operating costs per customer will increase until 2016 and then remain constant over the remainder of the AA4 period (see Figure 41).

Figure 41: Actual and forecast network operating costs per customer: 2011 to 2019



6.8.1 Network costs by category

The following sections provide a description of each network cost category and outline the forecast costs within each category. The drivers for the cost increases over AA4 period are discussed in detail below.

(a) Variable volume network maintenance

Variable volume network maintenance includes planned and unplanned maintenance to operate, inspect and maintain the Network. Examples of activities included in this cost category are annual leak survey, asset inspections, associated maintenance, leak repairs, customer requests, no-gas calls and reported gas escapes.

The following table presents the activities and costs associated with variable volume network maintenance for planned and unplanned maintenance activities.

Table 18: Forecast variable volume network maintenance costs 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Planned Maintenance							
Modify assets	0.3	0.5	0.5	0.6	0.6	0.6	3.1
Facilities maintenance	0.5	1.2	1.3	1.3	1.3	1.4	7.0
Leakage survey and pipeline patrols	0.4	0.9	0.9	1.0	1.0	1.0	5.2
Gas meter management	0.2	0.4	0.5	0.8	0.7	0.5	3.2
Systems monitoring	0.2	0.4	0.4	0.5	0.5	0.5	2.5
Retailer support services	0.3	0.6	0.7	0.7	0.7	0.7	3.7
Sub-total: Planned Maintenance	*1.9*	*4.0*	*4.3*	*4.9*	*4.8*	*4.7*	*24.7*
Unplanned Maintenance							
Pipeline maintenance service	1.6	2.8	2.8	2.9	3.0	3.1	16.4
Gas faults	0.7	1.5	1.5	1.6	1.6	1.7	8.7
Emergency support services	0.1	0.1	0.1	0.1	0.1	0.1	0.7
Sub-total: Unplanned Maintenance	*2.4*	*4.4*	*4.4*	*4.6*	*4.7*	*4.9*	*25.8*
Total variable volume network maintenance costs	**4.3**	**8.4**	**8.7**	**9.5**	**9.6**	**9.8**	**50.5**

- **Modify assets** - The alteration of mains, services and the cut and cap of mains. This work is carried out at the request of third party such as local authorities, government bodies, utilities and customers. This forecast represents the non-recoverable portion of undertaking this activity. ATCO Gas Australia undertakes all alterations to the Network to ensure that the works do not adversely affect network integrity and customer supply.

- **Facilities maintenance** – Proactive and preventive maintenance activities carried out at defined frequencies required to sustain the reliable operation of the gas distribution facilities. Maintenance activities include functional checks, equipment servicing and condition surveys.

- **Leakage survey and pipeline patrols** – Leak survey activities are undertaken at defined frequencies across the Network to identify mains that are leaking so that they can be safely and proactively repaired or replaced before escalating to larger, reactive and more costly repairs. Pipeline patrols comprise a damage prevention measure that identifies and prevents third party activity that could potentially impact underground gas assets. Pipeline patrols ensure that above ground signage of high pressure assets is compliant and is carried out in accordance with the requirements of AS2885.

- **Gas Meter Management** – this refers to the changeover and refurbishment of commercial meters that have reached the end of their compliance period, thereby ensuring the ongoing accuracy of gas consumption measurement to customers.

- **Systems monitoring –** Preventive actions to maintain the reliable operation of the telemetry equipment used for customer billing and Network monitoring purposes. Monitoring and data collection of Network performance is required for Network planning and operational decisions. The Network is also monitored to ensure integrity of supply and identify and respond to pressure excursions.

- **Retailer support services** - Retailer support services are activities carried out on behalf of retailers such as audits of approved installations, changes of meter, upgrades to regulators and re-lighting of pilot lights. The budget represents the non-recoverable costs of activities which are not charged to the retailer.

- **Pipeline maintenance service –** Planned and reactive mains and service maintenance activities, such as leak repairs, that address Network faults identified through proactive leak survey and reactive customer reported escapes. Maintenance is scheduled and prioritised based on Australian Standards classifications.

- **Gas faults –** Planned and reactive meter position maintenance activities that address network faults identified through customer reported escapes and faults. Maintenance is scheduled and risks prioritised as outlined in the AMP. The majority of faults are attributable to public reported gas escapes, public reports of loss of supply and network pressure issues identified by pressure monitoring devices.

- **Emergency support services –** Reactive maintenance activities resulting from third party damage to assets and requests for assistance by emergency services such as the WA Police and DFES. All emergency support activities are prioritised for immediate attention within one hour.

(b) Network maintenance projects

Network maintenance projects include specific operations and maintenance projects such as in-line inspections of high pressure pipelines, vegetation clearance, safety awareness and Dial Before You Dig (DBYD) programmes.

Table 19: Forecast network maintenance project costs: 2014 to 2019

$ million real at June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
AS2885 in-line-inspection of CL600 pipeline	-	-	0.1	0.1	0.1	0.2	0.6
Safety awareness	0.3	0.5	0.5	0.5	0.5	0.5	2.8
Dial Before You Dig	-	0.4	0.4	0.4	0.5	0.6	2.4
Water in the main non-recoverable	0.1	0.1	0.1	0.1	0.1	0.1	0.4
Proving	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Pipeline remedial works	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Meter set painting	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Pressure vessel inspection at PRS	-	0.2	0.2	0.2	-	-	0.5
Operation & maintenance of Mandurah Gate station	0.0	0.1	0.1	0.1	0.1	0.1	0.4
Inline inspection East Perth Lateral and HP pipeline 028	0.2	0.4	-	-	-	-	0.6
PVC studies	-	0.1	0.1	-	-	-	0.3
Other – for example vegetation clearing, signage	0.2	0.2	0.2	0.2	0.2	0.1	0.9
Total	**1.1**	**2.3**	**1.9**	**1.9**	**1.8**	**1.9**	**10.9**

- **AS2885 In-Line Inspection of CL600 Pipelines** – In-line inspections to provide an indication of the condition of the high pressure pipelines, including metal loss in wall thickness and deformation

- **Safety Awareness** – The objective of this program is to raise public awareness of the safe use of natural gas through education and information based media campaigns

- **Dial Before You Dig (DBYD)** – A key contributor to pipeline and mains failures is damage caused by asset strikes by third parties. DBYD is a shared initiative between various Western Australian utilities that enables the public to access and view maps illustrating the locations of underground services. This expenditure includes the fees charged by DBYD along with maintenance and upkeep of internal systems

- **Proving** – Proving is an activity that involves pot holing within the vicinity of the asset and locating the service and updating the GIS database accordingly. With the increase in DBYD requests, there is a requirement to provide additional proving services

- **Water in the Main (Non-recoverable)** – Aged gas hot water systems often fail due to corrosion. These failures can sometimes lead to leaks of water into the adjacent gas service at a higher pressure than the gas network pressure and as such, introduce water into the gas supply. Water in the mains can travel at high velocity and damage components or, if enough water has entered the system, prevent the flow of gas. In these instances, affected sections of the network and customers' services need to be isolated, purged and recommissioned

- **Pipeline remedial works** – When a pipeline is identified as having been damaged, or is at reduced depth of cover, this provides for the costs of remediation

- **Meter set painting** – To reduce failures on AL30 meter facilities due to corrosion, a meter painting remediation programme is required

- **Pressure vessel inspection at Pressure Regulating Stations (PRS's) –** Filters used at transmission to distribution PRS's are classified as pressure vessels and as such, require particular statutory re-verification of the safe pressure containment, at set intervals, to enable continued safe operation

- **Operation and maintenance of Mandurah gate station** – the cost of maintenance activities performed by DBNGP on the Mandurah Gate Station in order to maintain safety, reliability and metering accuracy

- **Inline inspection East Perth lateral and HP pipeline 028** - Inline inspections to provide an indication of the condition of the high pressure pipelines, including metal loss in wall thickness and deformation

- **PVC studies –** PVC was introduced as the material of choice for mains and services in the early 1960s. Some of these older mains are starting to exhibit failures due to brittleness. Due to the time-based nature of this failure mechanism and the large quantity of ageing PVC in the Network, it is prudent to undertake destructive material testing on samples during AA4 in order to inform future replacement decisions of the PVC network

- **Other –** maintenance activities such as vegetation clearing and repair of compound fencing and signage are more economical to group together and perform as a project rather than on an ad-hoc basis

(c) Network maintenance

Management, supervision and unallocated costs associated with asset inspections and maintenance, the provision of 24/7 operations and network emergency response across the geographic footprint of the network, network repairs, gas consumers installations inspections and third party damage prevention activities.

(d) Network control

Costs associated with the operation of the 24/7 control room, call centre, planning and dispatch functions and the Market Services function, which interacts with retailers to process new connection and other service order requests, as well as meter reading and the daily delivery of data to the retail market.

(e) Network operations support

Cost of asset management, engineering and technical compliance functions including training and health safety and environment management, costs associated with operation of the Jandakot Office and Operations Centre, other operational depots, fleet and equipment.

(f) Network construction

Management, supervision and unallocated costs associated with the execution of maintenance projects and other field maintenance activities.

6.8.2 Drivers of cost changes

ATCO Gas Australia has assessed the drivers of network operating costs by considering:

- **Baseline recurring costs** that will continue into AA4, which include recurring costs required to operate and maintain the growing customer base and footprint of the Network.

- **Incremental recurring costs** that relate to new requirements or activities predominantly required to comply with the Safety Case, in AA4 but are expected to continue.
- **One off costs** that relate to new requirements or activities predominantly required to comply with the Safety Case, in AA4 but are not expected to continue.

The charts below in Figures 42 and 43 show the overall drivers and trends in network operating costs from the actuals incurred in AA3 through to forecast expenditure in AA4.

Figure 42: Actual and forecast network operating costs 2011 to 2019

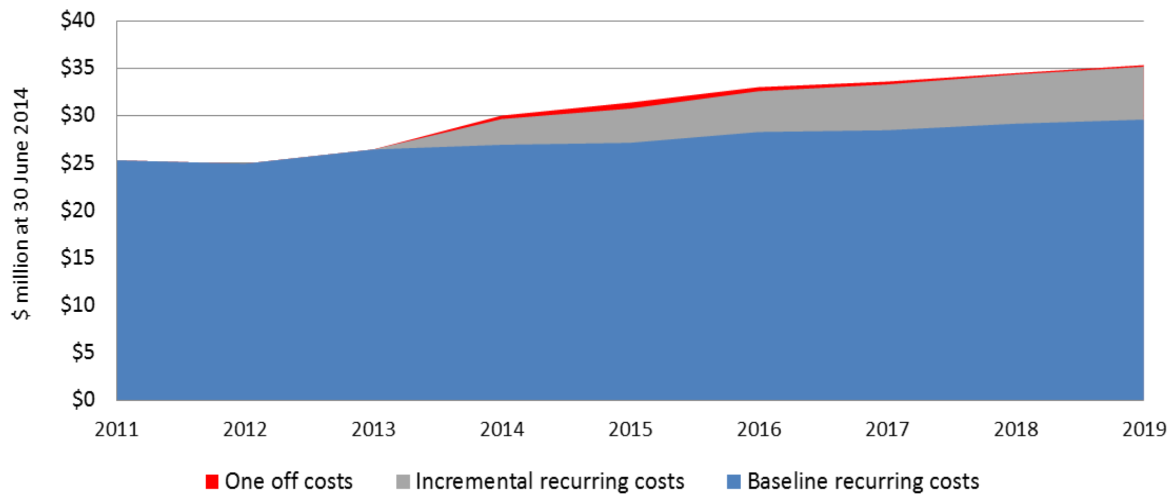
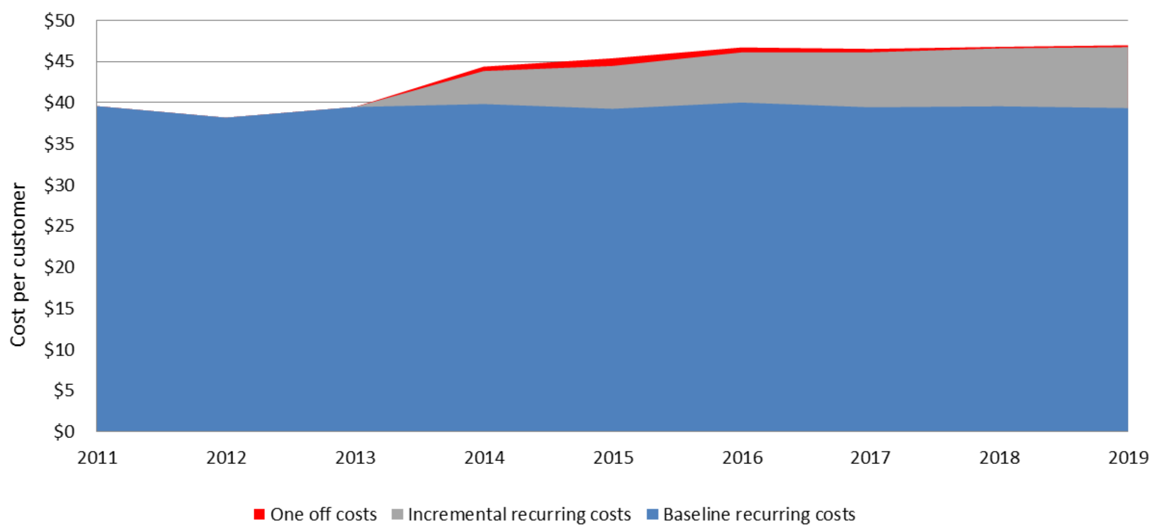


Figure 43: Actual and forecast network operating costs per customer 2011 to 2019



Baseline recurring network operating costs per customer are expected to decline during the AA4 period. Increases in network operating costs per customer are the result of new requirements or regulations that result in incremental recurring costs or additional one off costs.

The key drivers for the forecast increase in incremental recurring and one off costs in network operational expenditure are as follows:

- The implementation of the Safety Case
- New and amended obligations, legislation, rules, regulations and functions
- Business improvements and support through the utilisation of IT
- Growth in gas connections and network augmentation

Incorporating these new recurrent and one off costs results in the overall network operating costs per customer increasing until 2016 and then remaining constant for the remainder of AA4.

Table 20 below provides a breakdown of the one off and incremental recurring network operating costs forecast for AA4.

Table 20: Forecast one off and incremental recurring network operating costs 2014 to 2019

$ million real at 30 June 2014	2014	2015	2016	2017	2018	2019
Baseline recurring costs	**26.9**	**27.1**	**28.3**	**28.5**	**29.2**	**29.6**
Incremental recurring costs						
Leak survey	0.5	0.5	0.6	0.6	0.6	0.6
Facilities Maintenance Cathodic Protection	0.2	0.3	0.3	0.4	0.4	0.5
Commercial Meter Change	0.2	0.2	0.3	0.5	0.4	0.3
Systems Monitoring	0.1	0.1	0.2	0.2	0.2	0.3
Inspection of Gas Fitters	0.4	0.4	0.7	0.7	0.8	1.0
Proving gas mains location	0.1	0.1	0.1	0.1	0.1	0.1
Safety Awareness	0.5	0.5	0.5	0.5	0.5	0.5
Dial Before You Dig	0.0	0.1	0.2	0.2	0.3	0.3
Technical Compliance Inspectors	0.5	0.6	0.6	0.7	0.7	0.8
HSE	0.1	0.3	0.3	0.3	0.3	0.3
Asset Services	0.0	0.2	0.2	0.3	0.3	0.3
Market Services	0.0	0.2	0.4	0.5	0.5	0.6
Total incremental recurring costs	**2.7**	**3.6**	**4.3**	**4.8**	**5.2**	**5.6**
One off Costs						
In-Line inspections	0.4	0.4	0.1	0.1	0.1	0.2
PVC Studies	0.0	0.1	0.1	0.0	0.0	0.0
Pressure Vessel Inspection at PRSs	0.0	0.2	0.2	0.2	0.0	0.0
Total one off Costs	**0.4**	**0.6**	**0.4**	**0.3**	**0.1**	**0.2**
Total network operating expenditure	**30.0**	**31.4**	**33.0**	**33.6**	**34.5**	**35.3**

These costs are described in the following sections below.

(a) Incremental recurring costs

Leak survey

Conducting the leak survey FSA requirement as per Clause 6.5.3 of AS/NZS 4645.1-2008 was included in the Safety Case Implementation Plan and completed in January 2013. As part of the formal safety assessment, surveys were conducted to identify the locations to be surveyed annually. The result was an additional 753 locations, 868 kilometres of high risk pipeline and 179 kilometres of CBD streets where annual leak surveys are to be performed.

The outcome of the leak survey formal safety assessment and extent of changes to the leak survey programme and resource requirements could not be known until the completion of that assessment. An estimate of these costs were not included in the AA3 review as the Formal Safety Assessment, required as part of the Safety Case, had not been completed at that time.

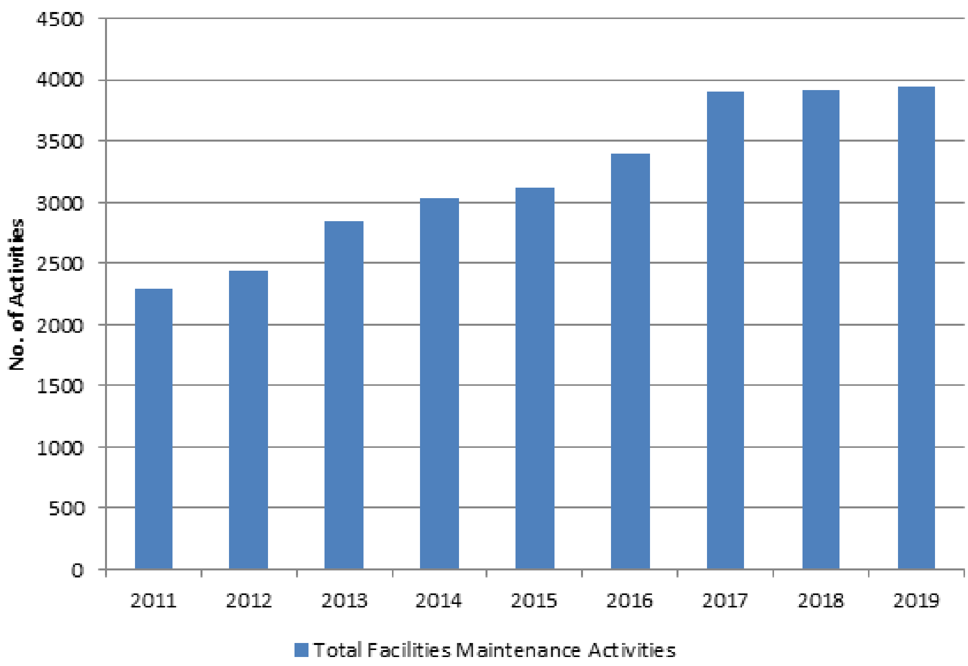
Facilities maintenance and cathodic protection

Pressure reduction and meter set facilities are essential for the safe, reliable and efficient delivery of natural gas. Pressure reduction facilities give the network operator the ability to maintain consistent and safe pressures within the gas distribution system and provide increased capacity for growth or upgrades. Meter set facilities typically have higher downstream pressures[71] than residential meters and measure gas consumption at industrial and large commercial end use customers as well as small commercial customers with high volume meters.

Maintaining pressure reduction facilities reduces operational risks such as pressure lock-up[72] or potential over pressure[73] into networks not rated for higher pressures. Pressure reduction facilities are separated into High Pressure (HP)[74] and Medium Pressure (MP). As documented in the AMP HP regulator sets and HP meter sets are maintained every four months and MP regulator sets and MP meter sets maintained every 18 months.

The approximate 50% forecast increase in facilities maintenance planned activities since 2011 is largely attributed to extending the planned maintenance of small commercial meter sets where the customer has a maximum capacity of 40 m^3 per hour[75] as required under the Safety Case. The increased expenditure is also attributed to network growth and network capacity upgrades. Figure 44 below depicts a summary of the points above.

Figure 44: Facilities Maintenance historical and forecast planned and reactive activities



Cathodic protection is used in 100% of the Network's high pressure steel pipelines with a maximum allowable operating pressure (MAOP) greater than 1050 kPa. It protects steel pipelines from corrosion, which has the potential to cause material fatigue leading to failures or capacity constraints. Cathodic protection personnel are utilised in most preventative maintenance requirements for the HP network. Planned cathodic protection activities are set out in Figure 45 below.

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[71] High Pressure Meter sets operate in networks with pressures greater than 700 kPa delivering pressures to downstream end-use customers up to 500 kPa.

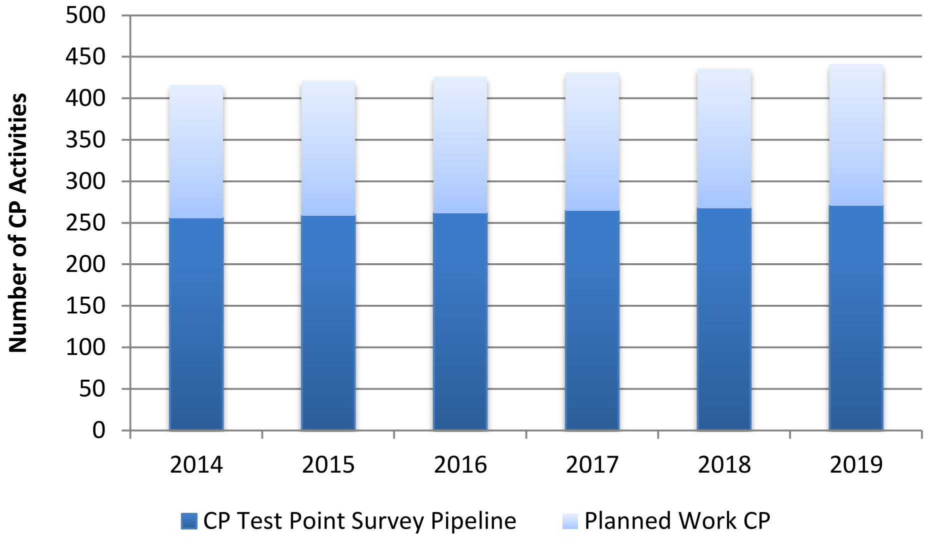
[72] Pressure "lock-up" is when over pressure protection devices are tripped accidentally or pressure regulators fail causing gas flow to be isolated.

[73] Over pressure downstream of a regulator set would primarily be caused by internal mechanical failure of pressure regulating equipment and systematic failure of pressure relief devices.

[74] Includes Pressure Reduction Stations (PRS).

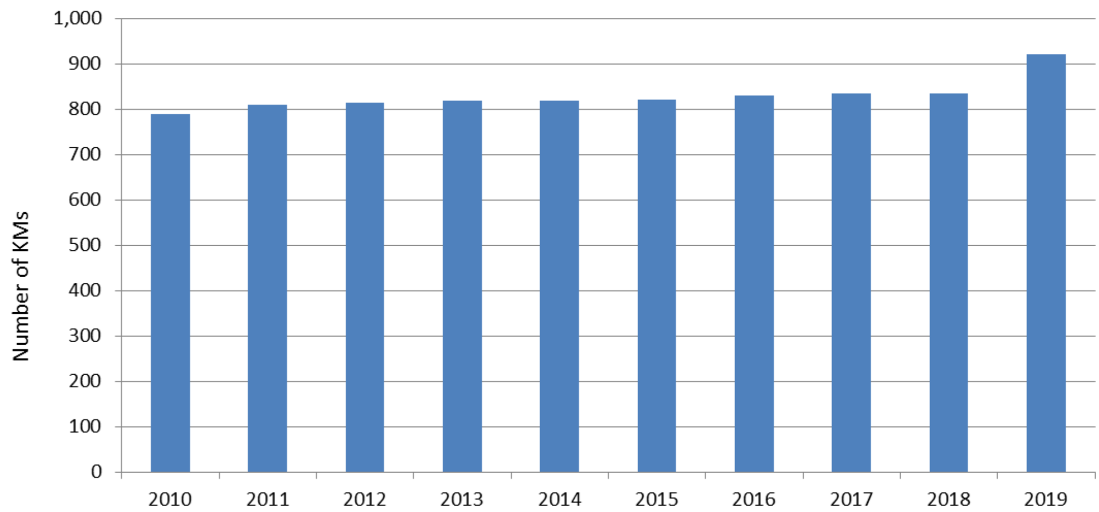
[75] Customer's meter sets with a rated capacity of 40 m^3 per hour were not included in regular maintenance activities in the previous AA3.

Figure 45: Cathodic protection (CP) planned activities



The length of the Network is forecast to increase by 12.5% over the AA4 period. Figure 46 shows the increase in actual and forecast network pipelines requiring patrol. In addition to this increase in patrol distance the Safety Case requires additional protection requirements for new pipelines such as additional signage and increased patrol frequency due to commercial and domestic growth[76]. See Figure 46 below.

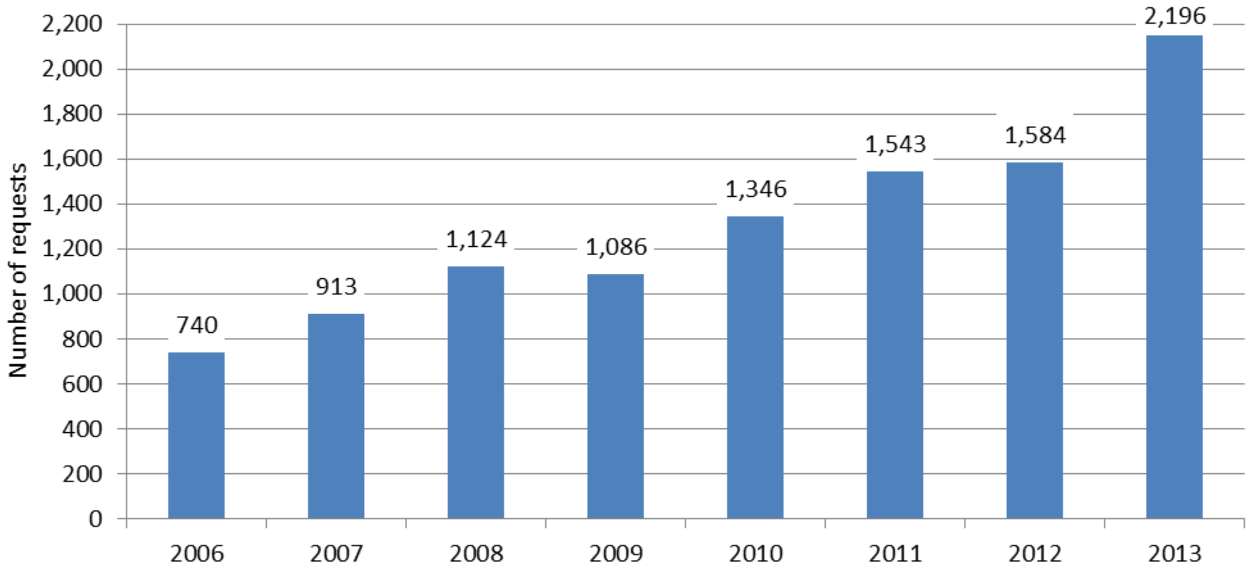
Figure 46: Length of network pipelines requiring pipeline patrol in kilometres per year



There has been a 114% increase in customer driven HP pipeline location requests between 2006 and 2012. With the forecast economic growth in Western Australia and the requirement for third party underground utilities or communications ATCO Gas Australia forecasts an increase in network operating costs to comply with customer driven HP pipeline activities. The growth in high pressure pipeline location requests is shown in Figure 47.

[76] Australian Standards require increased frequencies for pipelines encroaching on residential or built up location classes. Typically, the encroachment is due to new development within close proximity of existing ATCO Gas Australia pipelines, causing ATCO Gas Australia to update/upgrade pipeline location classes.

Figure 47: Customer driven high pressure pipeline locations request between 2006 and 2013



Commercial meter change

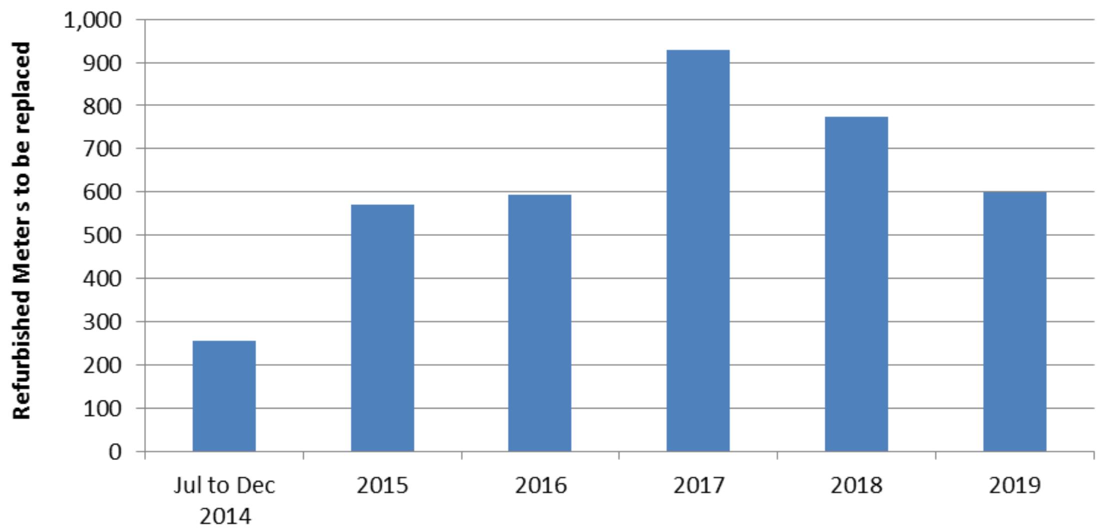
Maintaining the accuracy of industrial, large and small commercial meter sets is essential for reducing UAFG attributed to metering inaccuracies and capturing correct consumption for high volume end use customers. Commercial Meter Changes (CMC) are required on a routine basis to comply with regulations. The change cycle for each commercial meter type are reflected in the meter change cycles listed in the GSSS Regulations.

The meter change programme ensures industrial and large commercial customer meters achieve accuracy levels that:

- Comply with the criteria specified in the GSSS Regulations
- Meet the requirements of AS 4944-2006
- Meet the anticipated accuracy tolerance levels in future codes and regulations

Meters replaced under the CMC programme are replaced with refurbished meters and as such included as operating expenditure. The step change increase of CMCs in 2016 to 2017 is due to the end of service life falling within this period and is shown in Figure 48 below.

Figure 48: Forecast refurbished meters to be replaced: 2014 to 2019



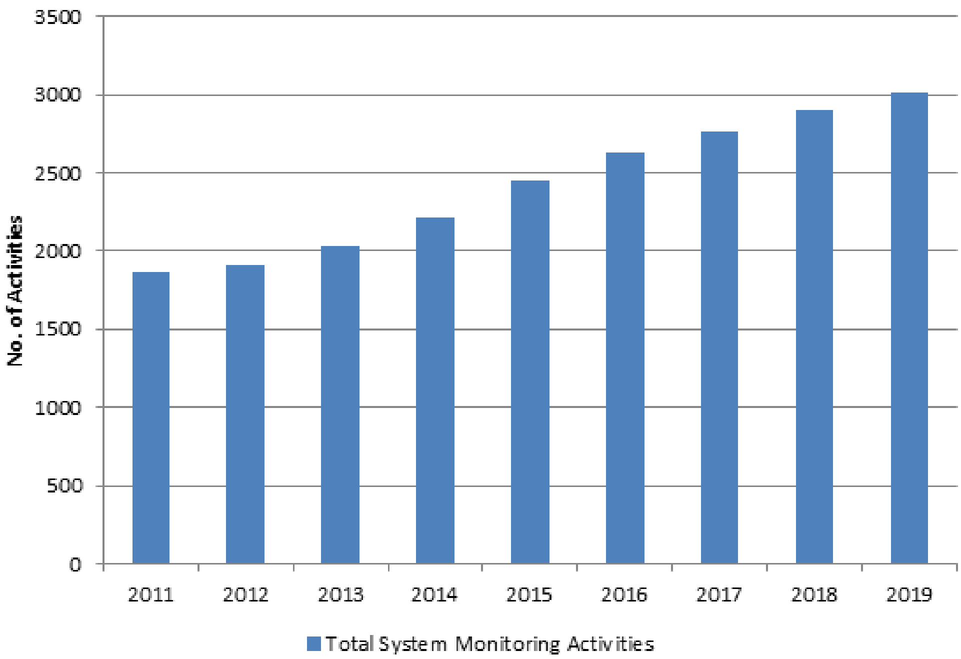
Systems monitoring

Telemetry equipment is essential for the safe, reliable and efficient delivery of natural gas. Electronic monitoring equipment is vital to assess ongoing performance of the Network, as changes in pressure, temperature or flow rates can indicate potential faults, which may otherwise go undetected. Telemetry is installed on all A Tariff customer meter sets providing hourly information for billing data (corrected for temperature and pressure). This data is critical for billing purposes and ties into commercial operations and market data.

Maintenance inspections and Accuracy Verification Tests (AVTs) are carried out on all telemetry equipment every six months. AVTs ensure accuracy of flow measurements, which allows ATCO Gas Australia to validate gas volumes, UAFG calculations and other inputs to network management.

Figure 49 shows historical system monitoring activities since 2011 and forecast activities for the AA4 period. The increase in activities is directly attributed to the number of devices forecast to be installed on the Network. The increase in instrumentation maintenance for regulator sets is due to the requirements of the Safety Case to have all HP regulator sets monitored for pressure to reduce the risk of network capacity issues due to mechanical failure. ATCO Gas Australia proposes to continue the Pressure Monitoring Device Data Visualisation Project into AA4, utilising telemetry equipment to enable gas pressures, temperatures and flow rates to be recorded and monitored.

Figure 49: System monitoring planned and reactive activities



Gas Inspection Team and inspection of customer gas installations

To ensure end use customer safety, and to comply with *Gas Standards (Gasfitting and consumer gas installations) Regulations 1999*, ATCO Gas Australia has a Gas Utilisation Inspection Plan which is accepted by Energy*Safety*. The plan outlines responsibilities to inspect customer gas installations to ensure they are safe to take gas. ATCO Gas Australia's Gas Inspection Team oversees the implementation of the Gas Utilisation Inspection Plan.

ATCO Gas Australia's current Gas Utilisation Inspection Plan expired at the end of 2013. Due to the variation in work volumes, inspection rates and periodic changes to the scope of inspections ATCO Gas Australia proposes a cost pass through mechanism as part of AA4 for the Inspection Team cost centre and cost of the all inspections conducted under the Gas Utilisation Inspection Plan. These inspections are typically performed by Customer Service operatives in Network Maintenance.

During the operation of the current Gas Utilisation Inspection Plan, a new requirement relating to 'Notice of Intent' was imposed. An approved R-factor change was made in relation to this event during the AA3 period, and is represented in the step increase in future costs for these inspections in the AA4 period.

Customer safety awareness programme

In October 2013, Energy*Safety* confirmed that ATCO Gas Australia is required to implement a customer safety awareness campaign in order to comply with the requirements of Appendix F of AS4645. Accordingly, ATCO Gas Australia will be embarking on a broad customer gas safety awareness campaign and is working with the ERA and Energy*Safety* on its implementation.

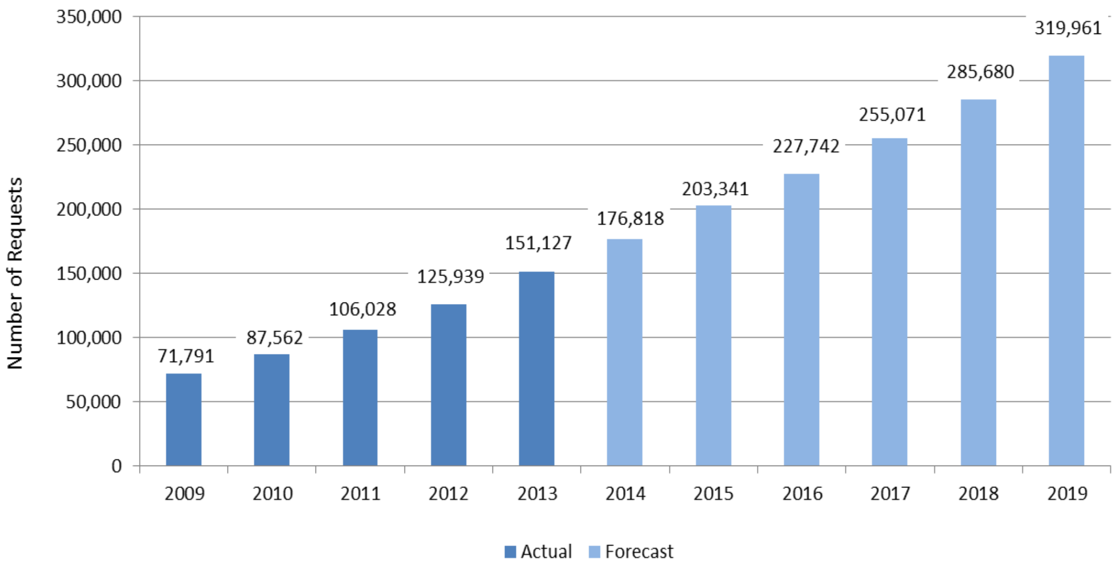
Dial Before You Dig (DBYD)

ATCO Gas Australia maintains an active role on the Board for Dial Before You Dig WA and on the WA Dial Before You Dig Management Committee. The number of DBYD requests is forecast to increase over the AA4 period (Figure 50).

For example, as part of its third party damage prevention programme ATCO Gas Australia issues DBYD plans to excavators. In situations when excavators are unable to locate underground plant, ATCO Gas Australia is required to provide a proving service. With the increase in DBYD requests, there is a corresponding increase in requirements to provide the proving service.

During AA4 ATCO Gas Australia will continue community engagement to prevent third party damage, including safety and training briefings to excavating companies and other utilities, proactive safety signage in accordance with Safety Case requirements[77] and targeting third party damage offenders with better prevention strategies. Proposed technology improvements include making DBYD information more readily available to the community via a range of delivery options including direct to smart phones and email.

Figure 50: Number of dial before you dig requests 2009 to 2019



Technical compliance & field inspections

ATCO Gas Australia is required to document compliance with the Safety Case as well as review its approach on an ongoing basis to reduce the risks associated with the Network to as low as reasonably practicable.[78] This process of continual review requires additional risk and safety engineering resources to manage the formal safety assessments (FSAs) and the obligations arising from them.

Safe Work Instructions developed as part of the Safety Case also require ongoing risk assessment and modification. This leads to development of safety training programmes to ensure personnel are provided with adequate procedures and are competent to carry out the activity. This ongoing training requirement for direct and contract staff means additional training, assessment, technical writing and systems analyst resources are required.

[77] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

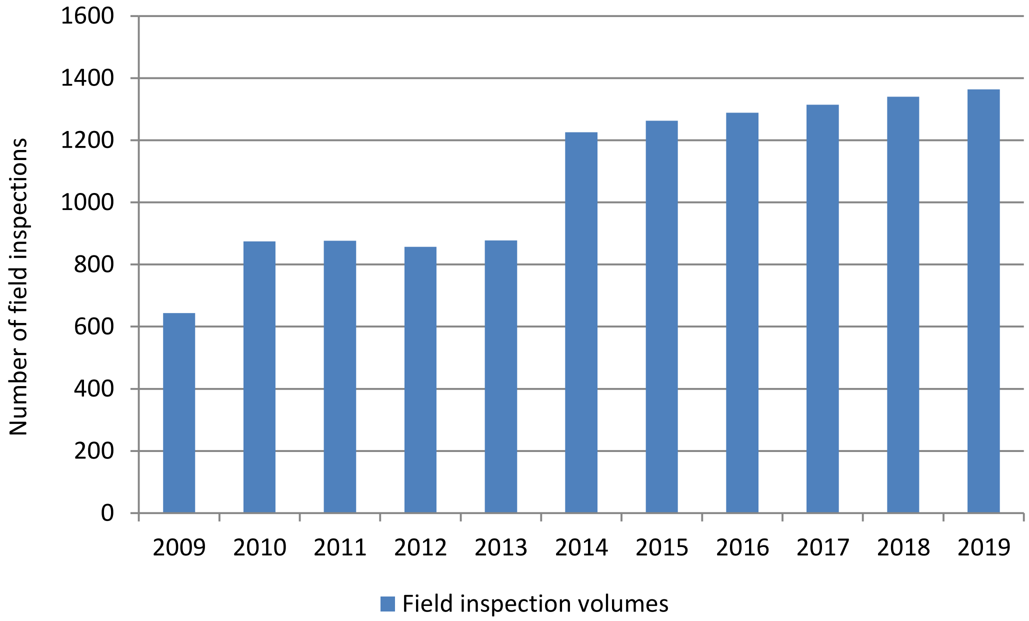
[78] Gas Standards (Gas Supply and System Safety) Regulations 2000, section 41.

ATCO Gas Australia conducted a FSA of field activities and determined the following:

- The requirements for performance monitoring of the competence and safety of employees and direct employed contractors
- The requirement to maintain the integrity of the gas distribution system through focused inspection and audit of field personnel undertaking prescribed activities

The FSA assessed the risk associated with each prescribed field activity, determined the frequency at which prescribed activities occur and assessed the number of inspections required. This has been applied to the forward programme of activities over the AA4 period to determine resourcing requirements. This has resulted in the required number of inspections almost doubling, leading to a step increase in the associated costs depicted in Figure 51.

Figure 51: Number of field inspections 2009 to 2019



HSE

ATCO Gas Australia maintains a Health, Safety, Environment and Quality (HSEQ) management system certified to AS/NZ 4801 (Safety Management Systems), ISO 9001 (Quality Management Standard) and ISO 14001 (Environmental Management Standard).

As part of this system a Safety and Environment Initiative Programme (SEIP) is developed that targets areas identified as having the highest risks to health, safety or the environment. Initiative programmes are selected based on a review of historical performance trends, emerging hazards and changes to workplace procedures or environments. The implementation of the SEIP programme and the development and implementation of resulting Risk Management Action Plans (RMAPs) requires additional HSE resources.

A behavioural-based safety programme is currently being implemented with the aim of reducing injury and incidents through positive reinforcement of safe behaviours and acts. The extension of this programme to the entire direct and contract workforce requires additional HSE resources.

Field based positions are generally manual handling intensive, which poses risk of injury. To reduce this risk ATCO Gas Australia will focus on early intervention and prevention programmes, complemented with injury management and return to work programmes for injured employees. The successful implementation and ongoing maintenance of these programmes will require additional HSE resources.

Asset services

As part of its Distribution Licence, ATCO Gas Australia is required to maintain an Asset Management System (AMS) that is subject to annual AMS performance reporting and periodic third party AMS audits conducted for the ERA.

The initial design of the AMS was performed in 2002 to meet the business needs of the time. Significant changes to IT capabilities and asset management needs since its development means the existing AMS needs to be updated. An International Standard ISO 55001 Asset Management – Management Systems – Requirements was released in 2014, which defines general requirements for an AMS. This Standard has been designed to enable asset intensive companies to achieve an appropriate balance of cost, risk and asset performance for managing its physical assets. During the AA4 period ATCO Gas Australia will align its AMS to this Standard and submit the revised AMS to the Coordinator of Energy as required under ATCO Gas Australia's distribution licence.

Implementation of the revised AMS will improve the delivery of optimised lifecycle asset management for the network by enhancing processes and tools, including IT SAP enhancements, for:

- Asset management strategy and planning
- Asset data and knowledge management
- Asset management decision-making
- Lifecycle delivery activities

This change in asset management approach will require additional asset planning, asset maintenance, asset reliability and data management engineering resources.

Market services

There is a requirement for an increase in market support levels as a result of new market entrants (Kleenheat and Self Contracting Users). The additional resource requirement will focus on further supporting timely and accurate customer transfers between retailers by elevating levels of data cleansing (in various databases), site visits (to confirm physical meter addresses) and monitoring of customer statuses (to manage exceptions, complaints and support timely customer transfers).

There is a forecast increase in meter reading activity costs as a result of new customer connections and increased service orders (eg, meter disconnection/reconnection, site investigations, special reads), which will in part be driven by the level of customer transfer activities. Furthermore, the forecasts factor additional costs to reduce the risks of non-compliant customer disconnections and reconnections.

There is a proposed increase in gas laboratory analysis costs to support ATCO Gas Australia's ongoing compliance with gas standards.

(b) One off costs analysis

The one off costs expected to be incurred include:

- In-line Inspections
- PVC Studies
- Pressure vessel inspections

In-line Inspections

High pressure (HP) gas steel pipelines operating above 1050kPa are operated and maintained in accordance with AS2885.3*.* All ATCO Gas Australia's high pressure steel pipelines (all pressure classes and locations) currently operate below the AS2885 maximum allowable hoop stress limit of 30% SMYS in populated areas (AS2885.1:2012 Section 4.7.2).

Remaining life review assessments must be conducted at a maximum of ten-year intervals in accordance with AS2885. In-line inspection or metal loss defect examinations are essential for HP steel pipelines reliability assessments and are regarded as good industry practice for pipeline integrity management and safety.

To facilitate an in-line inspection programme the high pressure pipelines must be altered to ensure that the pipeline inspection gauge (PIG) can travel the full length of the pipeline. This is predominantly achieved by flow stopping the high pressure mains, removing short radius bends and installing long radius bends so that the PIG can travel freely along the inside of the main.

An in-line inspection programme will provide a baseline of internal corrosion, unidentified external damage and enable pipeline assessment in areas not previously accessible to surface dig-up inspections, such as water course and major road/rail crossings, thereby ensuring integrity of all parts of the high pressure gas pipeline network.

The pipelines listed for inspection under this category will be prioritised in accordance with their age, operating pressure and risk based on proximity to sensitive areas.

PVC studies

ATCO Gas Australia owns, operates and maintains a gas distribution network of which 9,482 kilometre, or approximately 70%, is PVC. Formal Safety Assessments and associated lifecycle asset management plans requires ATCO Gas Australia to determine the condition of ageing PVC assets by testing pipes removed from service.

As a prudent operator ATCO Gas Australia will, where possible, use PVC pipe removed during repair activities as the pipe specimens for testing. However, the PVC studies will also require older pipe from some targeted locations to be removed and tested. A condition study and analysis will help determine end of life PVC replacement programmes. To ensure a robust database of information approximately 200 PVC samples will be removed and tested. PVC samples will be selected on the basis of pipe size, asset age, network location, leakage risk, areas of public assembly and dwelling density.

Pressure vessel inspections at PRS

ATCO Gas Australia owns, operates and maintains 17 Pressure Reduction Stations (PRS). The majority of these stations where installed between 1984 and 1986 and contain large bodied filters which comply with AS 2885.3. They must be inspected for integrity in accordance with AS 3788. In addition to these pressure vessel inspections, a further inspection regime (as outlined below) has been identified, which will help prioritise station remedial works to reduce the safety risk to as low as reasonably practicable.

The inspection regime covers:

- **Security:** stations will be assessed for adequate security and compliance with AS2885.1 Section 6.2.4.6 including fencing, gates and locks.
- **Vegetation fire hazards**: stations will be inspected for overhanging trees, encroaching vegetation and vegetation management within the compound to assess potential fire risks.
- **Vehicle impact protection:** findings of the desktop Vehicle Impact inspection, detailing the installation of bollards and crash barriers, will be confirmed on site.
- **Earth potential inspection**: stations will be inspected by external third party for compliance with AS2885.1 6.2.4.4 for earth potential risk mitigation.
- **Structural integrity:** stations will be inspected for compliance with AS2885.1 including corrosion of pipe supports, fatigue induced by vibration, corrosion at flange bolts, corrosion under insulated pipe coatings.

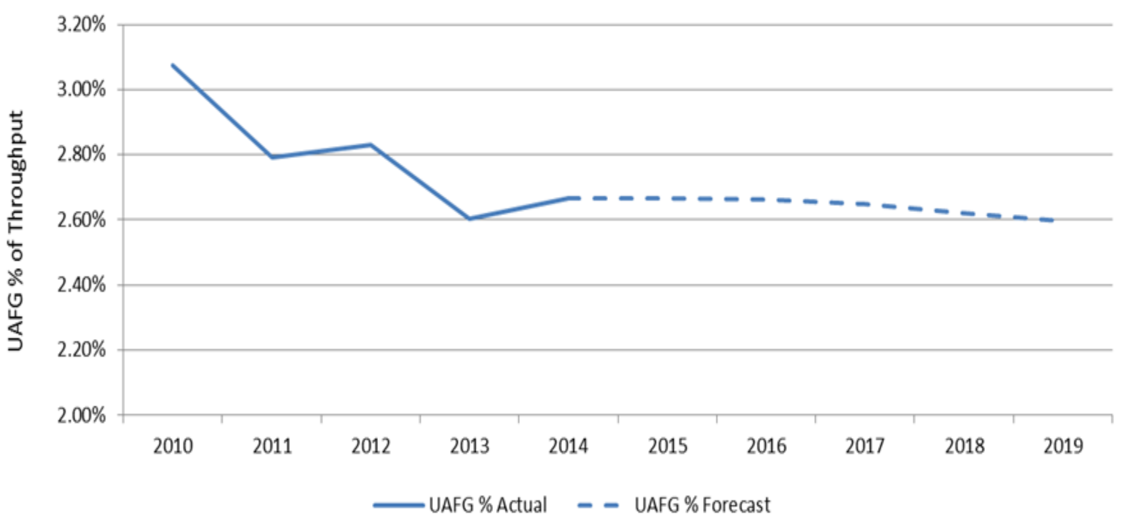
Combining these inspection activities will lead to increased efficiency and all inspections will be used to inform future asset management plans.

6.9 Unaccounted for gas (UAFG)

ATCO Gas Australia forecasts UAFG to increase slightly during AA4 and then return to the same level as in 2014 (2.6%). However, there will be an increase in the cost of UAFG from $10.3 million in 2014 to $12.6 million in 2019 as the volume of gas delivered through the system increases. The forecast is based on historical trends and assumptions regarding the levels of UAFG reduction achievable over the AA4 period from the implementation of the initiatives outlined below.

The chart below in Figure 52 illustrates the reduction in UAFG over the AA3 period and continued performance during AA4.

Figure 52: UAFG rate: 2010 to 2019



UAFG is the difference between the measurement of the quantity of gas delivered into the gas distribution system in a given period, and the measurement of the quantity of gas delivered from the gas distribution system during that period. ATCO Gas Australia incurs costs as a result of purchasing gas to replace calculated UAFG. These costs are then recovered from customers through tariffs. UAFG makes up a significant proportion of operating expenditure in each access arrangement. Therefore it is in the long term interests of customers to reduce the UAFG rate to as low as reasonably practicable. ATCO Gas Australia's UAFG rates are currently the second lowest compared to other Australian gas distribution networks (see Figure 53).

Figure 53: UAFG Comparison for Australian Gas Distribution networks[79]

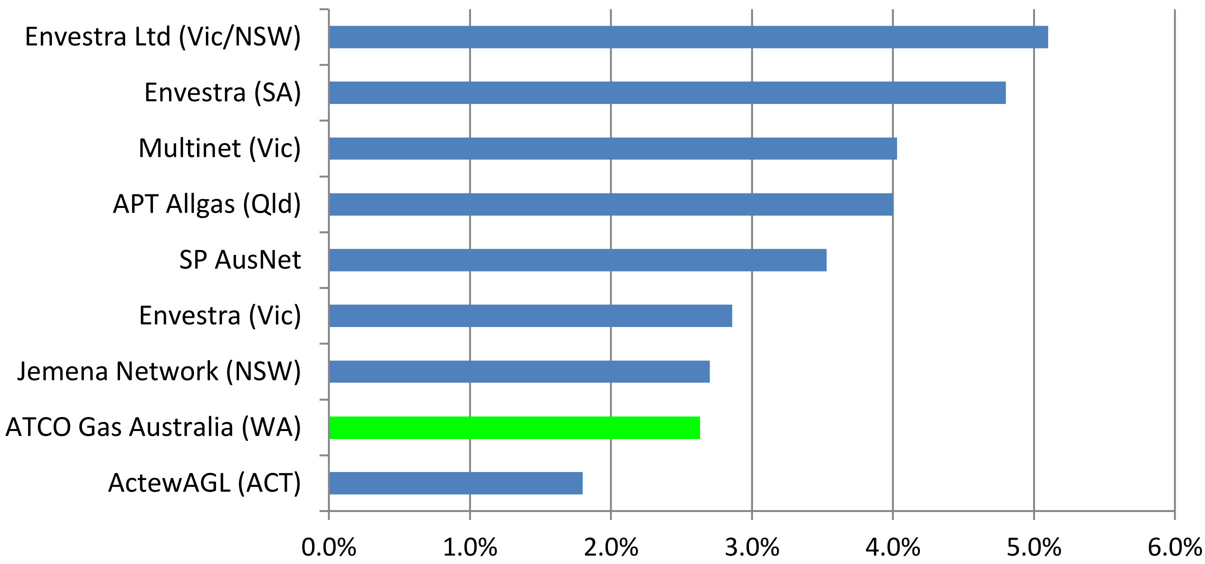


Table 21 presents the forecast rate and gas cost for the AA4 period.

Table 21: Forecast UAFG for 2014 to 2019 (including calendar year 2013 forecast)

Year	UAFG rate as % of throughput	Throughput (TJs)	UAFG Total Cost ($ million real at 30 June 2014)
2014	2.67%	27,578.6	$11.7
2015	2.66%	27,916.2	$11.7
2016	2.66%	28,349.5	$12.0
2017	2.65%	28,988.8	$12.2
2018	2.62%	29,753.0	$12.4
2019	2.60%	30,574.3	$12.6

UAFG expense is calculated as the product of:

- Forecast gas throughput for a year
- Forecast price for purchasing gas for a year

[79] Appendix 10: Review of the gas distribution systems unaccounted for gas , Zincara ,April 2013 and ATCO Gas Australia survey of Access Arrangement Information 2013.

- Forecast UAFG rate (as a percentage of total throughput) for a year.

There are a number of causes of UAFG, including:

- Operational losses resulting from:
  - Leakage
  - Third party damage to pipe work
  - Use of gas to "blow down", purge and pressurise during the commissioning of new facilities, and after maintenance
- Differences in the nature and timing of how inflows and outflows are measured (measurement inaccuracy);[80]
- Inaccuracy in the conversion from quantity of gas measured to energy (reflecting discrepancies in temperature, pressure, heating value, altitude or the gas compressibility factor);
- System line pack variations.

Measurement inaccuracy and operational losses, in particular leakage, are the main contributors to UAFG and each account for approximately 50% of total UAFG for the Network.

Activities to manage UAFG during AA4 include:

- Introduction of temperature compensated meters on a new and replacement basis
- Continue the programme of leak inspection and repair
- Complete the programme of metallic mains replacement
- Continue to review the meter size and accuracy of existing meters
- Seek competitive arrangements for the supply of the gas required to replace the UAFG

These activities are discussed in the following sections.

6.9.1 UAFG Strategy

There was a rise in UAFG over the 2005-2009 access arrangement (AA2) and WAGN, ATCO Gas Australia's predecessor, forecast a further rise in UAFG for the AA3 period. In its final decision on AA3, the ERA supported Energy *Safety* and WAGN's proposal to complete an independent study into the causal factors for UAFG and, if the study revealed reasons for the rise in UAFG, for WAGN to then "*plan and carry out appropriate corrective works".*[81] The ERA considered that:

[80] This issue is elaborated on in section 7 (Conforming capex) – meter replacement.

[81] Final decision on WA Gas Networks Pty Ltd proposed revised access arrangement for the Mid-West and South-West Gas Distribution Systems, [668].

> *this may facilitate WAGN's efficient operation of the GDS and to this extent the Authority would support reasonable and prudent expenditure that addresses and mitigates the rate of UAFG.* [82]

An engineering assessment was commissioned in 2009 on the causes of and possible initiatives to mitigate UAFG. The assessment reported issues and improvements against the known criteria and data at the time.[83]

In response to the 2009 Study on the causes of UAFG, ATCO Gas Australia worked with Energy*Safety* to:

- Appropriately update environmental correction factors for non-temperature compensated meters
- Introduce a programme to replace oversized industrial meters
- Enhance the detection systems and equipment to better detect fugitive emissions
- Progress its asset replacement, leak survey and repair activities

As a result, the UAFG rate fell below the forecast rate of 2.9% in the second year of the AA3 period (2011) and remained below the accepted UAFG rate for the rest of the AA3 period, reducing to 2.6% in 2013.

The actual gas price was higher than the forecast gas price in every year of the AA3 period.

ATCO Gas Australia has carried out its own investigation into the contributors to UAFG, including consideration of the experience of ATCO Gas (Canada), which has had an average UAFG rate of less than 1% since 2000. In comparing approaches to how ATCO Gas Australia and ATCO Gas (Canada) seek to minimise UAFG, the most significant differences are:

- ATCO Gas (Canada) has eliminated all bare and unprotected steel mains from its network
- All ATCO Gas (Canada)'s meters are temperature compensated at the point of measurement

ATCO Gas Australia has drawn on the findings in the 2009 study, its own findings from internal investigations and from ATCO Gas Canada to develop a strategy to address UAFG caused by leakage and measurement inaccuracy. This strategy seeks to reduce UAFG to as low as reasonably practicable in order to:

- Minimise UAFG expense and to deliver a cost competitive service in the long term interests of consumers
- Minimise the safety risk and improve reliability of the network
- Measure as accurately as possible consumption by end use customers to appropriately allocate the cost and usage of the network to customers

[82] Final decision on WA Gas Networks Pty Ltd proposed revised access arrangement for the Mid-West and South-West Gas Distribution Systems, [685].

[83] The assessment was implemented using information that was available at the time and by visiting a limited number of installations and facilities. No testing of meters, witnessing of calibration operational check or leakage tests were implemented as part of the assessment.

- Comply with Regulation 3 of the GSSS Regulations[84]

The following sections outline the activities being undertaken to address UAFG during the AA4 period.

(a) Leakage

The major source of leakage is the thousands of kilometres of mains that are buried in almost every street in the areas of distribution. These mains are made from a variety of materials using differing joining methods and representing decades of mains-laying activities and technological development.

ATCO Gas Australia's UAFG strategy proposes to continue to enhance the leak detection systems and equipment to better detect UAFG attributable to network leakage, progress its asset replacement, leak survey and repair activities to minimise leakage and in so doing reduce the associated risk to as low as reasonably practicable as required by the Safety Case.[85]

(b) Improved measurement accuracy

The majority of inflows are measured by equipment owned and operated by natural gas transmission companies in Western Australia. The measurement at inflow points is via high volume temperature and pressure compensated measurement equipment. The temperature and pressure adjusted volumes are recorded on a real time basis and reported daily for inflows.

Measurement at outflow points occurs through meters and associated measurement correction equipment at customers' sites. Measurement at residential and small commercial end use connection points utilises standard pressure measurement that is not temperature compensated. Large commercial and industrial customers have measurement correction equipment on site.

For residential and small commercial customers, ATCO Gas Australia uses a correction factor to adjust the measured volume to standard reference conditions of pressure and temperature. Australian standards for natural gas measurement require all volumes of gas measured be adjusted to a pressure of 101.325 kPa (absolute) and a temperature of 15°C.

The accuracy of measurement by meters that are not temperature compensated varies significantly as the temperature at the time of use is rarely the standard temperature. To improve measurement accuracy the following initiatives are proposed:

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[84] Australian Standard AS ISO 13443-2007 Natural Gas - Standard Reference Conditions specifies the standard reference conditions of temperature, pressure and humidity to be used for measurements and calculations carried out on natural gases:

Three Standard Reference Conditions The standard reference (or base) conditions of temperature, pressure and humidity (state of saturation) to be used for measurements and calculations carried out on natural gases, natural-gas substitutes and similar fluids in the gaseous state are 288.15 K (15 degree C) and 101.325 kPa for the real dry gas.

Gas Standards (Gas Supply and System Safety) Regulations 2000 specifies operating requirements for Master Meters:

Part 3 (15) (3) a network operator must ensure that every master meter, whether installed before, on or after commencement, measures the consumption of gas within a margin of error of —

(a) plus or minus 2% of the actual volume of gas supplied, if the master meter has a badged capacity of more than 6 m^3 per hour; or

(b) plus or minus 3% of the actual volume of gas supplied, if the master meter has a badged capacity of not more than 6 m^3 per hour.

[85] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

- Commence deployment of temperature compensated meters at residential and small commercial end use connection points in 2016 once the required changes to the billing system are in place. Temperature compensated meters will be installed on all new installations and at the time of Routine Meter Change (RMC). Based on the replacement of 150,000 meters, connection of 100,000 customers and an incremental cost per meter of $4.74, this programme will cost $1.185 million in capital expenditure over the period 2016 to 2019.

- Install a new regulator type that is resistant to field adjustments by end users and plumbers so that all residential and small end use connection points are measured at standard pressures. This initiative is forecast to cost $180,000 in capital expenditure over AA4 and will ensure more accurate metering to end use customers

- In accordance with discussions with Energy*Safety,* initiate a pilot study of a segregated network to study the variables attributed to UAFG and the different conditions that affect measurement or asset reliability. This study and its initiatives will total $687,000 over AA4. This study will provide ATCO Gas Australia with further evidence of UAFG causes and quantifiable measurement solutions to improve the management of UAFG across the Network

- Replace meters that are oversized for the individual commercial or industrial load. Oversized meters contribute to inaccurate metering and UAFG. ATCO Gas Australia has successfully replaced 20 industrial meters over the last two years ensuring more accurate metering across the range of delivered flows. ATCO Gas Australia forecasts capital expenditure of $100,000 in AA4 to replace ten existing oversized meters and implement ongoing systems to detect and substitute meters when applicable

- Continue to work with the homebuilding industry and mechanical contractors to ensure measurement meters installed are appropriately sized and consider all downstream consumption factors including load diversity. This initiative includes liaising and educating the building industry and does not require significant costs.

- Continue to work with Energy*Safety* to appropriately update environmental correction factors for non-temperature compensated meters. These changes are updated through internal and external systems at no significant cost

- Improve auditing of internal processes to deliver accurate and timely information from field to data systems reducing the error associated with measurement and data integrity

(c) Cost of gas

ATCO Gas Australia forecasts a rise in the cost of replacement gas over the AA4 period to reflect the impact of inflation. The unit costs per GJ are based on the gas price under the current gas replacement contract, escalated for CPI. The current gas replacement contract will expire on 30 June 2014.

ATCO Gas Australia will undertake a competitive tender process to establish a gas supply contract for the AA4 period and anticipates the tender process will be completed by the end of May 2014. The new gas replacement contract will be for the period 1 July 2014 to 31 December 2019 to coincide with the AA4 period. ATCO Gas Australia would expect to update forecast gas prices for the AA4 period once a new gas replacement contract has been finalised.

Although ATCO Gas Australia will endeavour to secure a competitive contract for the supply of gas, the cost of gas is often linked to the spot price of gas, which ATCO Gas

Australia has no ability to control. To the extent that the actual cost of gas varies to that forecast (higher or lower) ATCO Gas Australia will seek to pass through the variation through an increase or decrease in tariffs. The tariff variation mechanism is outlined in Chapter 12 (Reference Tariffs).

6.10 IT operating costs

ATCO Gas Australia will incur $67.1 million to support information technology requirements during the AA4 period. IT operating costs include the costs associated with shared IT hardware and software, IT service support and IT licences. These services are provided by ATCO I-Tek. The charges from ATCO I-Tek comprise:

- **Usage fee –** which covers essential shared IT hardware and software infrastructure upon which all ATCO Gas Australia corporate IT systems reside and operate
- **IT services fee** – this covers the IT support for telephony, telecommunications, network servers, security monitoring, applications, desktop support of ATCO Gas Australia's direct and shared systems, incident management, back-up and Disaster Recovery / Business Continuity Planning readiness, change and release management
- **IT licence fees** – this covers all vendor provided software used by ATCO Gas Australia for which vendors levy a fee on a per user basis as well as an annual maintenance fee.

The forecast costs for each of these components are provided in the following table.

Table 22: Forecast IT operating costs: 2014 to 2019

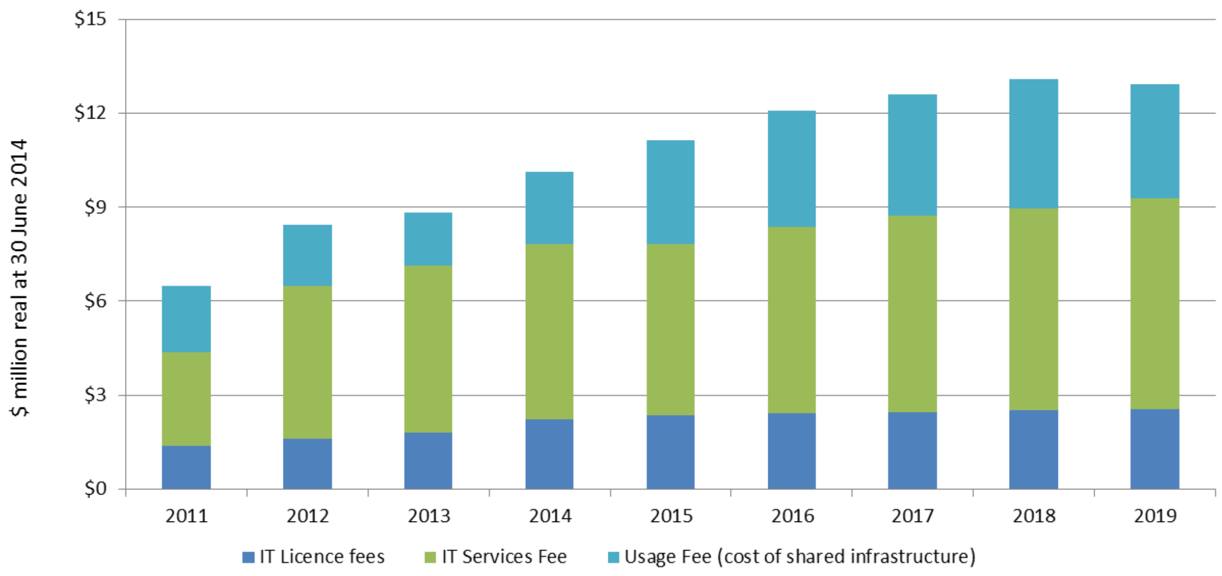
$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Usage Fee (cost of shared infrastructure)	1.4	3.3	3.7	3.9	4.1	3.6	20.1
IT Services Fee	2.7	5.5	5.9	6.3	6.4	6.7	33.5
Licence fees	1.1	2.4	2.4	2.5	2.5	2.6	13.5
Total IT operating costs	**5.3**	**11.1**	**12.1**	**12.6**	**13.1**	**12.9**	**67.1**

IT costs have been rising steadily over time and are expected to increase further in AA4. The drivers for an increase in IT operating costs in AA4 include:

- Safety Case requirements to document and retain records to demonstrate regulatory and safety case compliance
- Wholesale infrastructure replacement as it has reached end-of-life
- Entry of a new retailer in the Western Australian Gas Market which has increased the volume of churns and transactions in billing system (NMIS)
- Prior owners' reduced IT expenditures in AA3, in large part not to commit potential purchasers to a specific IT approach

Figure 54 shows IT operating costs over the AA3 and AA4 period.

Figure 54: Actual and forecast IT operating costs 2010 to 2019



ATCO Gas Australia is adding approximately 18,000 new end users each year and new retailers have entered the market adding to the transactions involving all customers. The growth in customer numbers and the network requires robust IT infrastructure and services to support the wide and comprehensive data needs of the business, regulators, service providers and the market.

The IT operating expenditure is based on the activities required to deliver the IT Strategy[86] and IT Asset Management Plan.[87] The IT Strategy describes the technology strategies ATCO Gas Australia will pursue and how these link directly to business objectives.

The IT Asset Management Plan (IT AMP) describes the technology, plans and strategies for the management of the IT assets as required to deliver the business objectives for the period of the access arrangement. In summary, the IT AMP:

- Confirms where ATCO Gas Australia requires IT systems to efficiently deliver its services to customers and meet regulatory requirements for information exchange along with other statutory requirements related to maintaining information in accordance with good IT operating practice and standards such as the privacy legislation in Australia
- Assesses ATCO Gas Australia's existing IT systems in the context of whether such systems continue to be prudently maintained, are consistent with good industry practice and operate in the long term interest of customers
- Identifies areas where ATCO Gas Australia's service to customers can be delivered more efficiently and effectively through the implementation of identified new IT systems

The following sections explain the increases expected in IT operating costs in the AA4 period compared to the AA3 period by charging category.

[86] Appendix 06: ATCO Gas Australia Technology Strategy.

[87] Provided in confidential Appendix 30: ATCO Gas Australia IT AMP, March 2014.

6.10.1 Usage fee

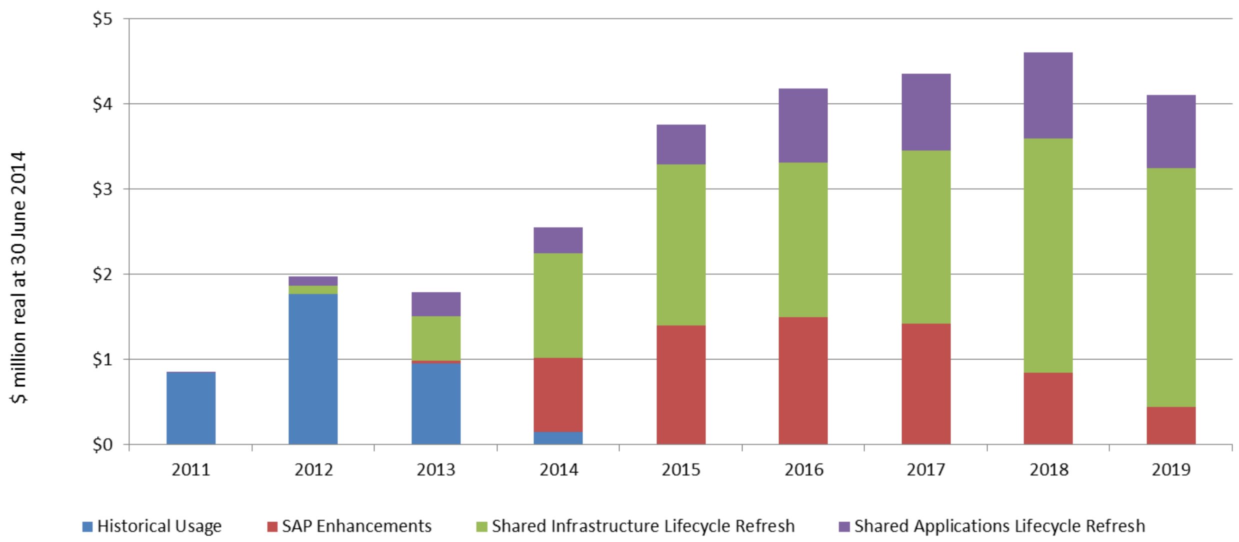
The usage fee covers the use of IT infrastructure. The infrastructure was established in 2008 and was shared with WestNet Energy, WestNet Rail and DBP. This infrastructure is used to deliver the IT systems and services ATCO Gas Australia currently utilises. In 2011, when ATCO purchased the Network, it also purchased the infrastructure hardware and data centre components now owned by ATCO I-Tek Australia. The usage fee reflects the return of and on the infrastructure investment.

The majority of the shared infrastructure utilised by ATCO Gas Australia reached its end of life in 2013 and needs to be replaced. The replacement programme commenced in 2012 and will continue throughout the AA4 period. If replacement does not occur, the support costs will increase, as will the risk of systems failure.

The IT AMP outlines the asset replacement and maintenance programme and identifies the assets comprising the ATCO Gas Australia systems. The previous Network owners minimised IT expenditures due to the imminent sale of the Network and its IT systems. Therefore, prior year expenditure levels are not considered representative of the ongoing expenditure required to ensure sustainable support from critical IT hardware and systems. The IT Infrastructure Replacement Project is forecast for the AA4 period at a cost of $9.7 million. This project is necessary to mitigate risk of system failure and potential exposure of ATCO Gas Australia to non-compliance or breach of regulatory and market rules. The project is also crucial in meeting ATCO Gas Australia's Disaster Recovery and Business Continuity Process obligations.

Figure 55 shows the composition of the usage fee.

Figure 55: Actual and forecast IT usage fee by asset type 2011 to 2019



Each component of the usage fee is described below:

- Shared Applications (Lifecycle Refresh) includes the following new and existing systems used for ATCO Gas Australia operational purposes:
    - **ATCO Performance** – for the effective performance management, succession management, compensation management and workforce planning of the workforce. This is a new application which will replace the existing performance management tool

  - Enterprise Information Management (EIM) – the document management system critical to ensure documents, Safety Work Instructions (SWIs) and other operational and reporting information is secured, controlled and accessible

  - webMethods – ATCO Gas Australia's core integration software which is integral in transporting data internally between core business systems such as SAP, Network Metering Information System (NMIS), Gas Network Information System (GNIS) and Field Mobility

  - Management Information System (MIS) / Business Intelligence (BI) – a new system which will continue to ensure the highest data security standards, minimise the duplication of data storage, ensure accuracy and consistency of data used across the business and provide a single view of the asset (SVA)

- **Shared Infrastructure** (Lifecycle Refresh) includes new infrastructure that replaces the end of life infrastructure used to provide IT network communications, for example:

  - Core switch replacement and network upgrade to increase the bandwidth of GNIS/GIS to support the increased usage amongst ATCO Gas Australia workforce and the additional capacity required to ensure stable and reliable connectivity between offices and depots

  - UNIX Enterprise Server Platform and Security Appliance replacement – the UNIX server runs core applications including the commercial services billing system used to provide production, development, test and disaster recovery systems. The UNIX infrastructure underpins the SAP, NMIS and GIS major business applications

  - WINTEL servers run on VMware hypervisors with in excess of 95% of the current WINTEL servers virtualised. The hardware platform is currently undergoing a refresh and moving from individual standalone hosts to a unified computer system (UCS). This will provide better resilience and expansion capabilities. The servers are used to provide production, development, test and disaster recovery systems. The Wintel hardware underpins the webMethods, Email, GIMS, GMD, DBYD, SharePoint and many other major business applications

  - MS Windows operating system will be out of support by 2015 and a new version of MS Windows will need to be implemented

- **SAP Enhancements** includes continual improvements to the existing SAP system for additional functionality and integration to new and existing IT Systems, and annual patching and upgrades to ensure the product remains vendor supported. In addition, a new SAP module will replace the existing Environment, Health and Safety System, which has reached end of life. SAP functional enhancements will also support the implementation of a revised Asset Management system to improve the delivery of optimised lifecycle asset management

- **Historical Usage** relates to previous Shared applications, Shared Infrastructure and SAP Enhancements costs which ATCO Gas Australia has incurred in previous periods

The projects and cost estimates supporting the IT operating cost forecast are outlined in ATCO Gas Australia's Information, Communications and Technology Asset Management

Plan (IT AMP)[88]. This plan is reviewed regularly to ensure that it continues to support the changing needs of the business.

6.10.2 IT service fee

This covers the 24/7 support of telephony, telecommunications, network servers, security monitoring, applications, desktop support of direct and shared systems, incident management, back-up and DR / BCP readiness, change and release management. Due to the change in corporate ownership the allocation of the costs relating to IT infrastructure changed in line with the reduction in the number of organisations sharing the IT platform. ATCO Gas Australia's service fees also increased due to the requirement to support new and replacement IT systems deployed into the ATCO Gas Australia IT Production environment. ATCO Gas Australia also requires new systems during AA4 to support the growth in the business and information requirements. The IT service fee will cover support for the following systems:

- Network Data Visualisation (NDV) – A system that provides a holistic view of the gas distribution network with near real-time data and the ability to 'visualise' the distribution pressure levels of the Network.
- Gas Distribution Billing Data Verification (GDBDV) – A system for metering governed by REMCo market rules. The system uploads, validates and transmits hourly interval metering consumption data for commercial customers.
- Gas Monitoring Data (GMD) – A system that supplies performance metrics data on the gas distribution network. Data is used to maintain, plan and forecast utilisation of the Network.
- Geo-spatial Information System (GIS) – an amalgamation of third party systems that collectively display mapping of all geographical location data associated with the gas distribution network. This system is tightly coupled with SAP Works Asset Management System.
- NEON Interval Metering - a web based application used to collect data for industrial telemetered sites, pressure monitoring devices and vehicle locations.
- Metering and Billing – collectively refers to the Gas Metering and Billing Systems, including GDBDV, GMD, Network Management Information System (Hansen Billing system), Gas Inflow Management System (a web based application to collect gas inflow data from the pipeline operators and calculate daily inflows, UAFG and Higher Heating Values), NEON and AGN Accrual (a system for accruing monthly bills).
- Field Mobility – a system used by field workforce to electronically dispatch, monitor and receive field completion details. The system is comprised of a dispatching solution that is utilised by workforce planning, a monitoring function that is utilised in conjunction with Network Data Visualisation and a completion details element that is used to populate the company's enterprise data warehouse, SAP, and allows for electronic access to Safety Work Instructions (SWI)

6.10.3 IT licence fees

ATCO Gas Australia is instituting new applications and integrating these new applications with existing applications, which will provide more employees with access to these

[88] Provided in confidential Appendix 30: ATCO Gas Australia IT AMP, March 2014.

applications. The ATCO Gas Australia workforce is also increasing and for many applications a licence is required per employee, therefore the licence fees will increase as the workforce grows.

6.11 Assessment of efficient IT costs

The forecast replacement of IT infrastructure includes core switch upgrades and replacements, firewall replacements, server replacements, virtualisation layer software upgrades and replacements, server operating system upgrades, wide area network (WAN) replacement upgrades and upgrades to the telephony infrastructure and network. All these elements of the existing IT infrastructure have or will reach end of life during the AA3 or AA4 period. As they reach end of life, those elements of the IT infrastructure have become outdated or outmoded and are or will no longer be supported by the vendor of those products[89].

All of the elements in the IT infrastructure replacement programme are at least six years old by the time they are forecast for replacement. To further defer or avoid replacement would:

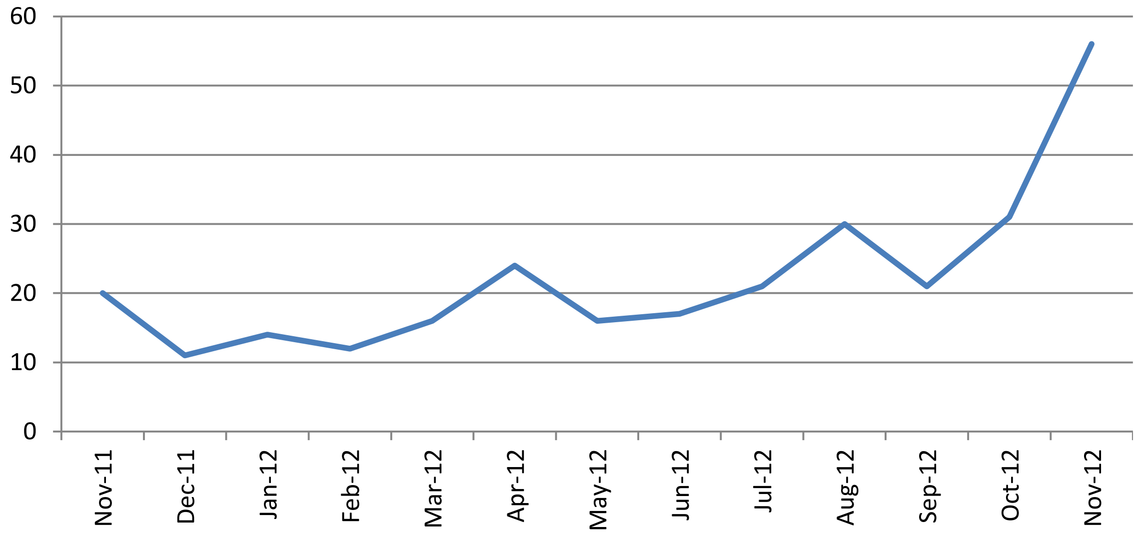
- Impact ATCO Gas Australia's ability to achieve its objectives of delivering safe, reliable, consistent quality of service for the IT systems relied upon to provide the reference services
- Impact the effectiveness and efficiency of operations and asset management due to decreasing reliability and increasing costs as noted by the Gartner article – "*Know when it's time to replace Enterprise Network Equipment*" [90]
- Increase the risk of not meet regulatory obligations, especially in relation to market interaction and compliance
- Reduce ATCO Gas Australia's ability to apply functional improvements to key business systems which may result in either:
    - An increase in administrative staff to perform tasks that can be potentially automated; or
    - Reduced staff productivity
    - By renewing and upgrading the infrastructure, ATCO Gas Australia will reduce ongoing IT maintenance and support costs.

ATCO Gas Australia reviewed the server related incidents occurring over the 12 months from November 2011 to November 2012 which indicated that server related incidents have been increasing significantly. An increase in incidents increases the costs of IT support. The server incidents are presented in the chart in Figure 56 below.

[89] Appendix 11: Know When It's Time to Replace Enterprise Network Equipment, Gartner, August 2012.

[90] Appendix 11: Know When It's Time to Replace Enterprise Network Equipment, Gartner, August 2012 p. 4.

Figure 56: Server incidents – November 2011 to November 2012



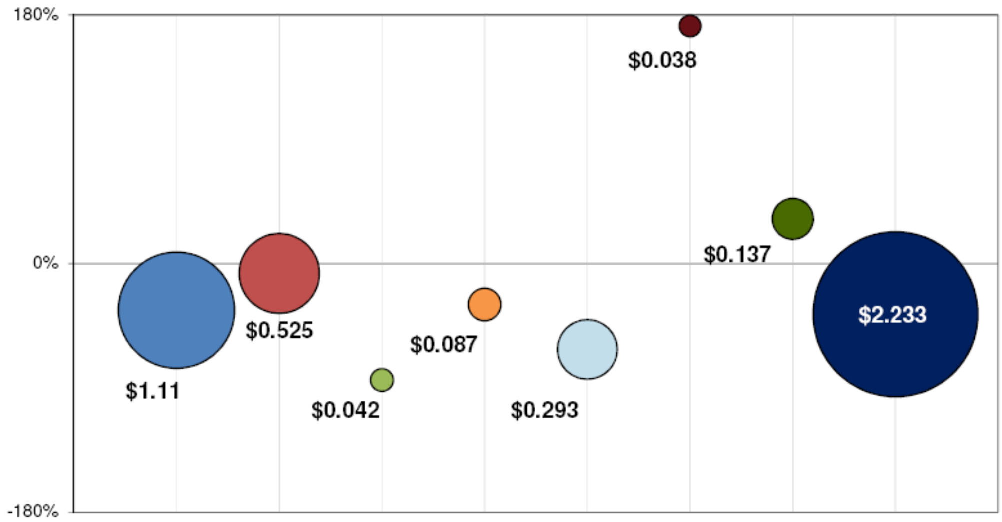
To ensure arrangements for system and service support are efficient, ATCO Gas Australia conducted a benchmarking exercise in 2013. IT Newcom was commissioned to perform a benchmark of the IT services provided by ATCO I-Tek Australia to ATCO Gas Australia.[91]

The benchmarking indicated that compared to the peer group, ATCO I-Tek's charges are on an average 37% below the average of the peer group. The peer group comprised a total of 17 companies from energy, industrials, utilities, government and financial sectors. Each IT service was compared to at least six comparable entities.

The figure below presents ATCO I-Tek's charges for each service category. The size of the corresponding bubble reflects the proportion of total charges for each service category. The position on the Y-axis is the percentage difference relative to the average of the peer group. The table below the chart presents the average charges of the peer group for each service category and the difference between I-Tek's charges and the average of the peer group.

[91] Provided in confidential Appendix 31: ATCO Gas benchmarking assessment report updated January 2014, IT Newcom.

Figure 57: Comparison of ATCO I-Tek cost of service for 2013



		Servers	End User Comp	Storage	Data Network	Data Centre	Voice Network	IT Service	Total Deal
Avg ($M / yr)		$1.681	$0.565	$0.270	$0.123	$0.775	$0.014	$0.103	$3.532
Relative to Avg	$M	-$0.568	-$0.041	-$0.228	-$0.036	-$0.483	$0.024	$0.033	-$1.299
	%	-34%	-7%	-84%	-30%	-62%	172%	32%	-37%

7. Past conforming capital expenditure

7.1 Key messages

- Past conforming capital expenditure of $270.5 million is to be added to the capital base. This includes the past conforming capital expenditure invested in the management and operation of the Network during AA3 as well as WestNet assets acquired by WAGN in 2010 less capital contributions

- Total capital expenditure of $270.5 million is estimated to be invested in managing and operating the Network system during the Current Access Arrangement Period (AA3)[92]. This is 3.5% more than the amount forecast for the period. This amount includes an estimate for the period 1 January 2014 to 30 June 2014

- Growth related capital expenditure during the AA3 period was lower than forecast due to economic conditions affecting new housing developments and gas connections. Sustaining related capital expenditure was higher than forecast over the period due to the implementation of the Safety Case[93] during the second half of the AA3 period

- The AA3 investment complies with the National Gas Rules because:

    - It was incurred to provide haulage services utilising a network that is managed in accordance with accepted good industry practice. ATCO Gas Australia has incurred the expenditure on a prudent basis in line with business planning and investment governance systems and processes, and the use of using efficient procurement practices to achieve the lowest sustainable cost of providing services

    - Growth related capital expenditure satisfies the incremental revenue test

    - The remainder of the capital expenditure satisfies at least one of the criteria under rule 79(2)(c) of the NGR

7.2 National Gas Rules requirements

The *National Gas Rules* (NGR) set out criteria that must be satisfied if new capital expenditure is to be added to the capital base for recovery via future reference tariffs.

Under rule 77(2) of the NGR, only conforming capital expenditure made during an earlier access arrangement period can be added to the opening capital base for the next access arrangement period.

Rule 78 of the NGR provides that the projected capital base is the opening capital base plus forecast conforming capital expenditure for the period.

Conforming capital expenditure is capital expenditure that conforms with the criteria of rule 79(1) of the NGR:

- the capital expenditure must be such as would be incurred by a **prudent** service provider acting **efficiently**, in accordance with accepted **good industry practice**, to achieve the **lowest sustainable cost** of providing services; and

[92] 1 January 2010 to 30 June 2014.

[93] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

- the capital expenditure must be justifiable on a ground stated in rule 79(2) of the NGR.

Capital expenditure is justifiable, under rule 79(2) of the NGR, if:

- the overall economic value of the expenditure is positive ("**economic value test**") (rule 79(2)(a) of the NGR); or

- the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure ("**incremental revenue test**") (rule 79(2)(b) of the NGR); or

- the capital expenditure is necessary:

    - to maintain and improve the **safety** of services (rule 79(2)(c)(i) of the NGR); or

    - to maintain the **integrity** of services (rule 79(2)(c)(ii) of the NGR); or

    - to comply with a **regulatory obligation** or requirement (rule 79(2)(c)(iii) of the NGR); or

    - to maintain the service provider's **capacity to meet levels of demand** for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity) (rule 79(2)(c)(iv) of the NGR).

- the capital expenditure is an aggregate amount relating in part to incremental services which are justifiable under rule 79(2)(b) of the NGR and the remainder relates to expenditure outlined in rule 79(2)(c) of the NGR, such as to maintain the integrity of services

Rule 79(3) of the NGR limits the scope of the economic value test, requiring that, in deciding whether the overall economic value of capital expenditure is positive, consideration be given only to economic value directly accruing to the service provider, gas producers, shippers, and users of gas.

The incremental revenue test under rule 79(2)(b) of the NGR compares the present value of expected net incremental revenue with the present value of new capital expenditure. The new capital expenditure can be added to the capital base only if the present value of net incremental revenue expected to be generated is greater than the present value of the expenditure.

Rule 79(4) of the NGR guides the application of the test in determining the present value of expected net incremental revenue:

- a tariff is to be assumed for incremental services based on (or extrapolated from) prevailing reference tariffs;

- incremental revenue is to be the gross revenue expected to be derived from the incremental services less incremental operating expenditure; and

- the discount rate to be used is to be the rate of return implicit in the reference tariff[94]

ATCO Gas Australia's capital expenditure was incurred to provide haulage services utilising a network that is managed in accordance with accepted good industry practice. ATCO Gas Australia incurred expenditure on a prudent basis, in line with business planning and investment governance systems and processes and utilising efficient procurement practices to achieve the lowest sustainable cost of providing services.

ATCO Gas Australia's growth related capital expenditure is justifiable on the basis that it satisfies the incremental revenue test. This is discussed in the section 7.6 of this document.

The rest of ATCO Gas Australia's capital expenditure is justifiable on the basis it satisfies at least one of the criteria under rule 79(2)(c) of the NGR. This is discussed in Chapter 8 (Capital Expenditure).

7.3 Summary of past conforming capital expenditure

$270.5 million of capital investment was undertaken during AA3. This amount is $9.2 million (escalated to 2014 dollars) or 3.5% more than the forecast amount approved by the ERA in its 28 February 2011 access arrangement determination. The majority of the investment occurred in the later years of the AA3 period subsequent to ATCO Group acquiring the Network from WAGN and commencing operations of the network. ATCO Gas Australia submits that all of the past capital expenditure satisfies rule 79(1)(a) of the NGR and is justifiable on grounds stated in rule 79(2) of the NGR and can be included in the opening capital base.

Table 23 shows AA3 capital expenditure by asset class compared to the forecast approved by the ERA for inclusion in total revenue for the period. The ERA approved forecast has been escalated to 2014 dollars using CPI (weighted average of eight capital cities).

[94] Appendix 12: Applying the new capital extension criteria to expansions of the Mid-west South-west gas distribution system, Marsden Jacob,April 2010, The criteria under rule 79(2) of the NGR are explained in more detail in pages 7-9 of this report.

Table 23: Capital expenditure by asset class actual and ERA approved forecast for 2010 to 2014

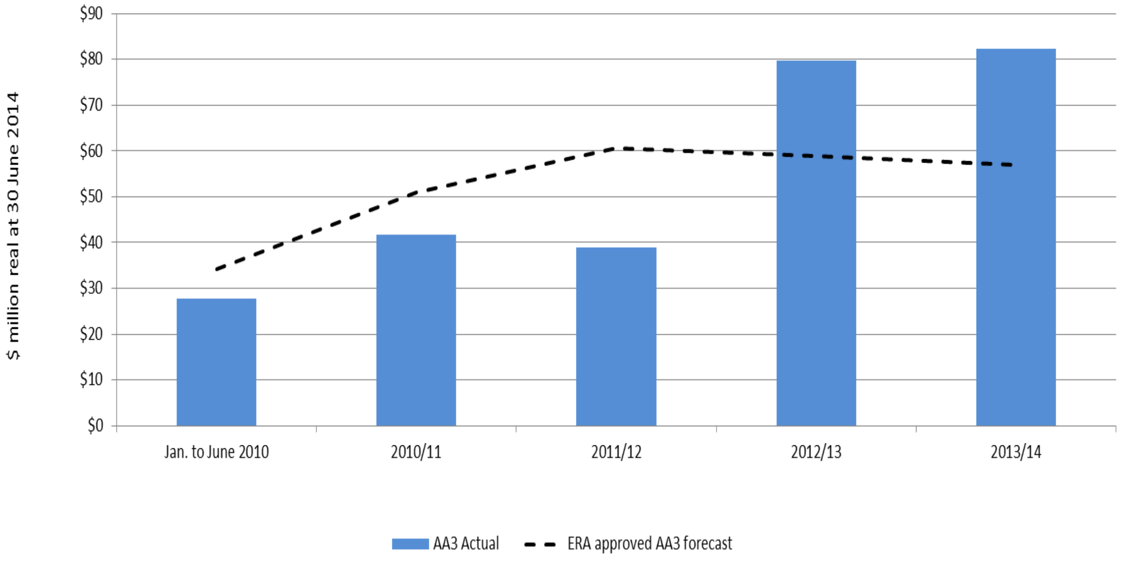
$ million real at 30 June 2014	Jan to Jun 2010	2010/11	2011/12	2012/13	2013/14	Total (AA3)	ERA Approved	Variance
High pressure mains	8.9	3.6	2.9	20.8	6.2	**42.3**	**46.9**	-4.6
Medium pressure mains	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	0.0
Medium/low pressure mains	5.2	10.4	11.3	22.8	19.7	**69.4**	**60.5**	8.9
Low pressure mains	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	0.0
Regulators	0.3	0.2	0.4	1.2	1.4	**3.7**	**1.8**	1.8
Secondary gate stations	1.9	0.2	0.3	0.0	0.0	**2.3**	**2.7**	-0.4
Buildings	0.1	1.2	0.8	4.5	11.2	**17.7**	**10.4**	7.4
Meter and services pipes	9.6	20.9	18.7	21.0	29.8	**99.9**	**117.6**	-17.7
Equipment	0.0	0.2	0.4	0.9	2.6	**4.1**	**1.4**	2.6
Vehicles	0.0	0.6	0.8	3.3	6.9	**11.7**	**0.0**	11.7
Information technology	1.9	4.4	3.3	5.3	4.6	**19.3**	**19.9**	-0.5
Full retail contestability	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	0.0
Land	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**	0.0
TOTAL	**27.8**	**41.7**	**38.9**	**79.7**	**82.4**	**270.5**	**261.4**	**9.2**

The main drivers for the variance between the ERA approved forecast and the expenditure undertaken are:

- **High pressure mains and meter and service pipes -** lower than forecast connection numbers resulting in lower expenditure on meters and service pipes and deferral of high pressure mains extensions
- **Buildings and vehicles** - ATCO Gas Australia has implemented a built for purpose and ownership strategy for buildings and vehicles on the basis that costs over time are lower than leasing
- **Medium/low pressure mains -** the Safety Case which was accepted by Energy*Safety*, was implemented in January 2013 resulting in an increased expenditure requirement across the work programme from 2013

Figure 58 compares actual capital expenditure to the capital expenditure forecast approved by the ERA.

Figure 58: Forecast and actual conforming capital expenditure 2010 to 2014



Conforming capital expenditure to be added to the asset base also includes the value of the WestNet assets and excludes capital contributions. Table 24 shows conforming capital expenditure incorporating these categories. WestNet and capital contributions are discussed in section 7.8 and 7.9.

Table 24: Conforming capital expenditure for AA3 to be added to the capital base

$ million real at 30 June 2014	Jan to Jun 2010	2010/11	2011/12	2012/13	2013/14	Total
Network Sustaining	11.6	9.5	9.6	28.3	22.2	**81.2**
Network Growth	14.2	25.8	24.0	37.5	35.1	**136.6**
Structures and equipment	0.1	2.0	2.0	8.7	20.7	**33.5**
IT	1.9	4.4	3.3	5.3	4.5	**19.3**
Total capital expenditure	**27.8**	**41.7**	**38.9**	**79.7**	**82.4**	**270.5**

7.4 Compliance with rule 79(1)(a) of the NGR

ATCO Gas Australia considers expenditure undertaken during AA3 is such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

The work was undertaken to achieve the outcomes required by legislation and regulations including the Gas Distribution Licence requirements, Asset Management System, Safety Case and the Asset Management Plan. Rigorous business planning and investment governance ensures expenditure to undertake the work is at the lowest sustainable cost.

ATCO Gas Australia takes a practical approach to managing safety risk, following a lowest life cycle cost approach to asset management. The business adopts good industry practice when delivering the work, demonstrated through ongoing compliance with quality assurance accreditation and adhering to project management, procurement policies and investment governance processes.

7.4.1 Planning the work required

ATCO Gas Australia's overarching asset management and operations objectives are to provide safe, reliable, cost competitive, sustainable and customer friendly natural gas delivery service. Central to achieving this objective are the requirements of the Safety Case, which ATCO Gas Australia as a prudent network operator is committed to complying with.

Under provisions of the regulations governing gas distribution safety, WAGN (as the then network operator) was required to submit and subsequently received acceptance by the Director of Energy*Safety* of its first Safety Case[95] on 28 July 2011. The Safety Case was implemented over an 18 month period to January 2013.

The Safety Case documents the processes and procedures the network operator must employ to ensure the safe, reliable operation of its gas distribution system. The network operator is required to document and demonstrate compliance with the Safety Case as well as review its approach on an ongoing basis so as to reduce the risks associated with the Network to as low as reasonably practicable.

The Safety Case aligns to Australian Standards AS/NZS 4645 and AS 2885 for a safety management system. It provides a road map that describes the systems that need to be in place for the safe operation of the Network. These systems include network design, construction, operation, maintenance, training and supervision to manage the risks arising from hazards identified as having the potential to result in an incident.

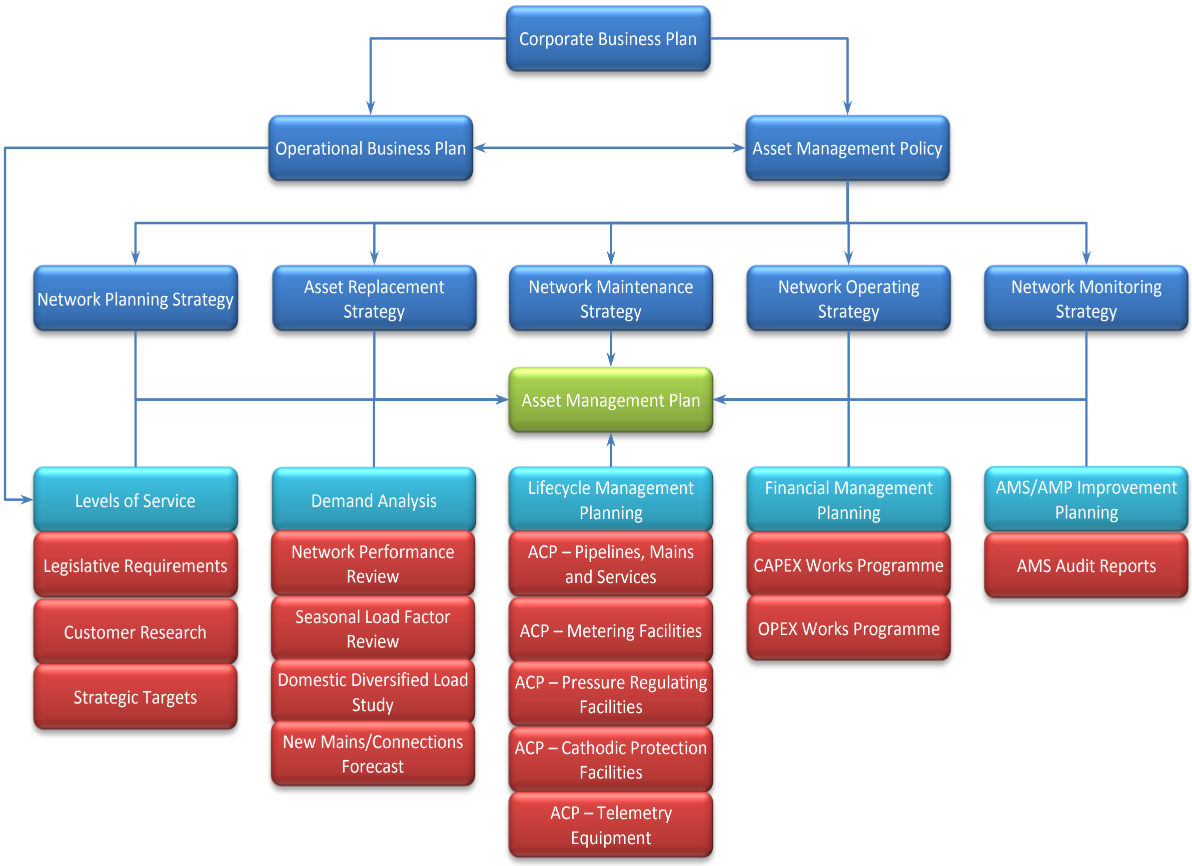
The Safety Case requires the network operator to conduct a formal safety assessment (FSA) for the range of assets and operations across the Network. The Safety Case FSAs conducted on each asset class inform the asset class plans for their lifecycle asset management.

ATCO Gas Australia's annually reviewed AMP[96] sets out the plans, programmes and strategies for the management of the network assets. The plan is designed to demonstrate the suitability of network assets for current and future service levels and performance targets. It also assures ATCO Gas Australia's investment in the network is prudent and appropriate to manage the risks associated with owning and operating the asset. Figure 59 shows the various supporting documents for the AMP.

[95] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.

[96] Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014.

Figure59: Asset Management Plan supporting processes



7.4.2 Prudent project governance

ATCO Gas Australia has thorough planning and approval processes to ensure capital expenditure is prudent, efficient and consistent with good industry practice. This involves rigorous application of technical, managerial and financial governance processes to ensure expenditure meets regulatory, legal and operational obligations in a manner that achieves the lowest sustainable cost of providing services to customers.

Controls are applied throughout the life cycle of a project or works programme. During the project design phase, alternatives are analysed and life cycle asset management principles employed to determine the optimum solution for customers. Gas network demand models are used to ensure network capability and integrity is maintained to meet customer demand over the long term.

Network reinforcement and demand projects are phased to ensure minimum supply pressures are maintained and the Network is designed for long term growth forecasts and security of supply. Such projects may be deferred where load growth or network expansion is less than forecast and investment can be deferred without risking supply reliability or safety.

Wherever possible, network alterations and extensions are timed to coincide with works undertaken by road authorities, other utilities and land developers. For example, ATCO Gas Australia will seek to coordinate laying new mains with the laying of other services in a common trench such that excavating is only undertaken once.

Cost estimates are developed to ensure projects are forecast as accurately as possible, considering historical trends and known future changes such as materials specification revisions. Actual costs are compared against forecast with an approvals process required for cost escalations.

For customer initiated network extensions, economic modelling is undertaken to determine whether the extension passes the economic test under Rule 79(2)(b) of the NGR. Where the connection does not satisfy this rule, a capital contribution from the customer is requested for the project to proceed.

Project governance framework

ATCO Gas Australia has a five-phase governance framework for all projects and programmes:

1. **Initiating** - Identifies the need for asset creation or replacement based on long term life cycle asset management principles and a robust risk management framework

2. **Planning and design** - Identifies and assesses the different solutions to achieve the lowest sustainable option while meeting Australian Standards and relevant technical specifications. Ensures an appropriate plan for the execution of the chosen solution including approvals, procurement and project phasing

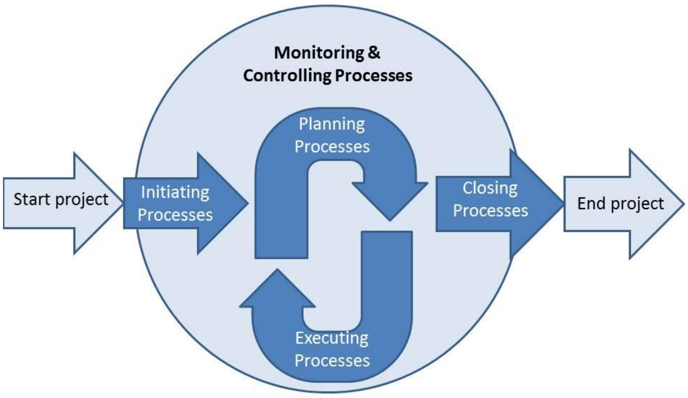
3. **Executing** - Ensures the project is delivered on time, to specification of the plan, and within the budget contained in an approved business case. Safe work instructions and permits are used to help ensure work is undertaken safely and that a safe and a reliable gas supply is provided to customers

4. **Monitoring and controlling** – Tracks monthly cost, scope and timing controls to regulate the progress and performance of the project, identify areas in which changes to the plan are required and initiate the changes

5. **Closing** - Finalises all project activities with benefits realisation and feedback of lessons learnt to continuously improve project planning and delivery

Figure 60 illustrates the project governance phases.

Figure 60: ATCO Gas Australia project governance framework



The governance framework helps ensure projects and works programmes are managed effectively and efficiently to completion. Table 25 outlines key processes and documentation used in each project phase.

Table 25: Processes and documentation for each project phase

Stage	Process / document
Stage 1: Initiation Identifies the need for asset creation or replacement based on long term lifecycle asset management principles.	Asset Management Strategy **Asset Management Plan**[97] Risk management framework Network Modelling Customer Requests
Stage 2: Planning and Design Identifies and assesses the different solutions to address the need to achieve the lowest sustainable cost option. Ensures an appropriate plan for the execution of the chosen solution including approvals, procurement and project phasing.	**Business case (detailed below)** **Procurement Policy (detailed below)** Formal safety assessment Project management plans Inspection Test Plan Early design and feasibility studies Options and estimating processes Capital investment/operating expenditure Regulatory test, including new facilities investment test where applicable Environmental assessments Engineering Design and technical standards and specifications, the key design standards include: • AS 2885 Pipeline – Gas and Liquid Petroleum (for the design and construction of high pressure assets above 1,050kpa); and • AS/NZS 4645 Gas Distribution Network Management (for the design and construction of assets below 1,050kpa)
Stages 3 & 4: Executing & controlling Ensures the project is delivered on time, within budget and to specification of the plan using cost, scope and timing controls.	**Delivery Strategy (detailed below)** All major projects are subject to a competitive tender process. The assessment criteria include the contractor's experience, ability to carry out the project and the contractor's quality management system During construction projects, regular audits and inspections of activities are carried out to ensure that the work is carried out in accordance with the project management and inspection test plans Permit systems and Safe Work Instructions Regular meetings and reporting to track progress and assess project changes.
Stage 5: Closing Finalise all project activities with benefits realisation and feedback.	**Periodic Review** Project handover processes Review of implementation of previous processes and their effectiveness The location and operational data is recorded in ATCO Gas Australia's Gas Network Information System (GNIS) and SAP. Contractor evaluations

[97] Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014.

The works programme is reviewed and reported monthly to ATCO Gas Australia Executive Management to ensure scope and costs are closely controlled and remain aligned to business objectives. The business uses a Capital Expenditure Approval Request (CEAR) process to review, assess and approve cost variations to budget. This process is described in the section below.

7.4.3 Investment governance

ATCO Gas Australia applies a CEAR process to all capital projects. All projects in excess of $100,000 require a supporting business case that must be signed off at executive management, president, managing director or board level, depending on the value of the project or works programme and the delegated financial authority levels.

The CEAR process requires that before the executing stage commences:

- The project and work programme investment requirements, scope, objectives and deliverables are specified
- Other options are considered and risk assessed
- Where appropriate, an economic assessment of lifecycle costs, including a NPV assessment, is undertaken
- Key risks and their mitigations are identified
- The preferred option is reviewed for compliance with relevant NGR

Business cases follow an internal approval process with mandatory reviewers to assess and approve from an operational, regulatory, risk, compliance and financial perspective.

7.4.4 Efficient procurement and contract management

ATCO Gas Australia has a procurement policy which includes purchasing guidelines summarised by the key principles below:

- Adopt a value for money approach (i.e. endeavour to obtain goods and services at the lowest overall cost whilst maintaining standard requirements)
- Select suppliers who have a credible reputation in the market, have a sound credit rating and whose practices are not inconsistent with those of ATCO Gas Australia
- Encourage competition among suppliers by seeking multiple quotations and calling for tenders, in conjunction with regularly reviewing market conditions and performance of suppliers under existing contracts
- Maintain integrity, ethics and fair dealing in conducting procurement activities (for example confidentiality, security, probity and management of conflicts of interest)
- Ensure risk management is inherent throughout the procurement process
- Ensure adherence to individual delegated financial authority limits

All purchasing decisions that relate to capital expenditure are made in compliance with the Procurement Policy.[98]

ATCO Gas Australia also has tendering, probity and contract management guidelines. The tendering guidelines outline the tender process associated with procurement of goods and/or services. The guidelines cover the key responsibilities involved in tender formation and the procedures that must be carried out by staff to ensure effective tender process management.

The probity guidelines outline the probity and ethics applied in the procurement of works, goods and/or services. The guidelines outline the key responsibilities and procedures that must be carried out by employees to identify potential and actual conflicts of interest in procurement and contract negotiation processes.

The contract management guidelines outline the contract management process and obligations to ensure ATCO Gas Australia's interests are protected. The guidelines cover pre-contract planning; the approvals and negotiation processes, day-today contract management, ending a contract and post contract processes.

ATCO Gas Australia operates a number of procurement and financial control procedures including delegated financial authorities, purchasing procedures, vendor selection and purchase requisition processes. The policies and procedures are overseen by the ATCO Gas Australia finance and commercial teams and are subject to periodic review, updates and internal audit.

When procuring goods and services, ATCO Gas Australia seeks to obtain competitive pricing at all times. This involves market testing of the pricing as well as review of the terms and conditions that the goods and services are provided under. In addition, contracts or purchase orders to be placed with external suppliers are subject to an Executive Approval Memorandum (EAM) process. The EAM process comprises procurement and regulatory process compliance, financial control compliance, business case compliance and legal review before executive management approval.

The policies and practices above are designed to ensure ATCO Gas Australia's capital expenditure is as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services (Rule 79(1)(a) of the NGR).

Work programmes are delivered using a mixture of ATCO Gas Australia workforce and contractors to ensure efficiency and cost competitiveness. ATCO Gas Australia retains the necessary in-house skills and expertise to ensure visibility and control of its projects, while delivering efficient work programs by utilising supervised contract resources to manage peaks and troughs caused by seasonal demands and constraints.

7.5 Compliance with Rule 79 (2) of the NGR

The following sections explain in further detail how past capital expenditure under each expenditure category meets the requirements of rule 79(2) of the NGR. The past capital expenditure has been divided in to two categories:

- **Growth capital expenditure** (section 7.6 of this document)
- **Sustaining capital expenditure** (section 7.7 of this document)

[98] Appendix 07: ATCO Gas Australia Procurement Policy, September 2012.

- **Structures and equipment** (section 7.8 of this document)
- **Information Technology** (section 7.9 of this document)

Growth capital expenditure includes customer initiated and demand related capital. Growth capital expenditure is expected to deliver a positive NPV as a result of providing economic benefits or supporting sufficient incremental revenue to cover the incremental costs and therefore comply with NGR 79 (2) (a) or (b). ATCO Gas Australia has undertaken an NPV assessment for AA3 growth related expenditure at an aggregate level. Business cases for each project and programme also contain NPV assessments.

Sustaining expenditure is that required to maintain and improve safety and integrity of services and meet regulatory obligations and requirements. It includes capital expenditure for sustaining and growing the network, structures and equipment, performance and IT, IT. This expenditure is expected to comply with NGR 79 (2) (c) (i) to (iv).

Table 26 shows expenditure by category for each year of the AA3 period compared to the total forecast approved by the ERA escalated to 2014 dollars.

Table 26: Capital expenditure by cost category: 2010 to 2014

$ million real at 30 June 2014	Jan to Jun 2010	2010/11	2011/12	2012/13	2013/14	Total (AA3)	ERA Approved	Variance
Sustaining	11.6	9.5	9.6	28.3	22.2	81.2	51.9	29.3
Growth	14.2	25.8	24.0	37.5	35.1	136.6	190.3	(53.7)
Structures and equipment	0.1	2.0	2.0	8.7	20.7	33.5	1.4	32.0
IT (previously Other – Performance, IT)	1.9	4.4	3.3	5.3	4.5	19.3	17.8	1.6
TOTAL	**27.8**	**41.7**	**38.9**	**79.7**	**82.4**	**270.5**	**261.4**	**9.2**

Further details of the growth capital expenditure and sustaining capital expenditure, and compliance with rule 79 of the NGR are set out in the sections below.

7.6 Growth Capital Expenditure

Growth capital expenditure is incurred to extend and the Network to accommodate new customer connections. Table 27 shows the ERA approved forecast of growth capital expenditure and the actual capital expenditure.

Table 27: Actual and forecast growth capital expenditure during AA3

$ million real at 30 June 2014	ERA Approved	Actual/Forecast	Variance
Growth	190.3	136.6	(53.7)

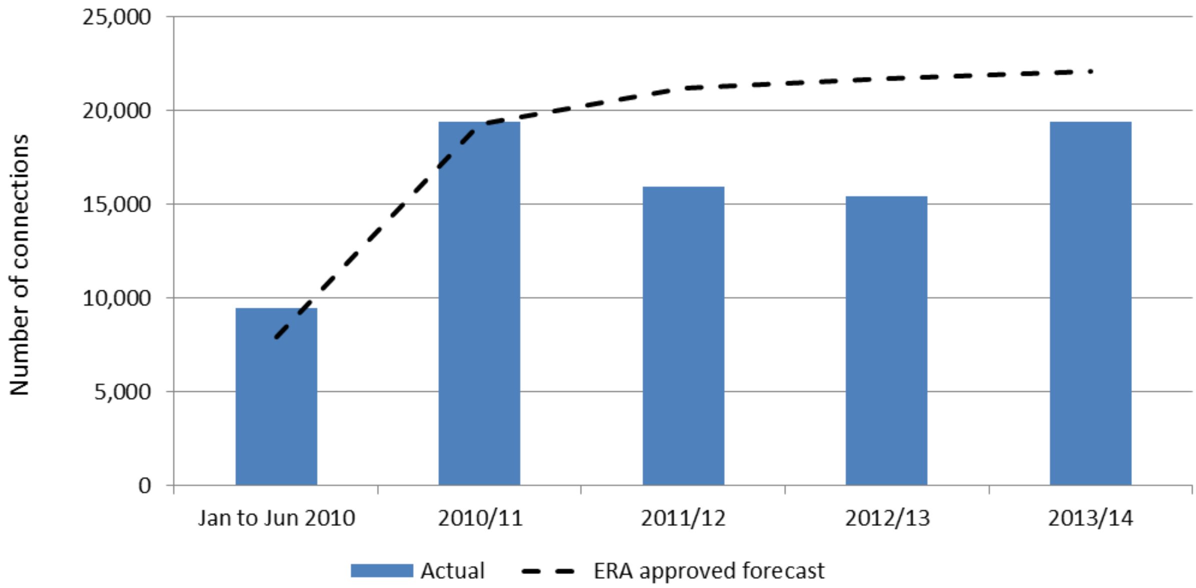
New connections declined further than forecast over the AA3 period, contributing to a lower level of expenditure in services and meters than forecast. Lower than forecast new housing activity and subdivision growth on the periphery of the network also resulted in the deferral of high pressure network extensions until AA4. These projects are presented in the table below.

Table 28: Key high pressure network extension projects deferred from AA3 to AA4

Key HP Network Extensions deferred to AA4	$ million real at 30 June 2014
Busselton CL150 High Pressure Capel steel pipeline and Pressure Reduction Site installation	5.9
Pinjarra CL150 High Pressure steel pipeline	4.7
Baldivis CL150 High Pressure steel pipeline	4.7
Total	**15.3**

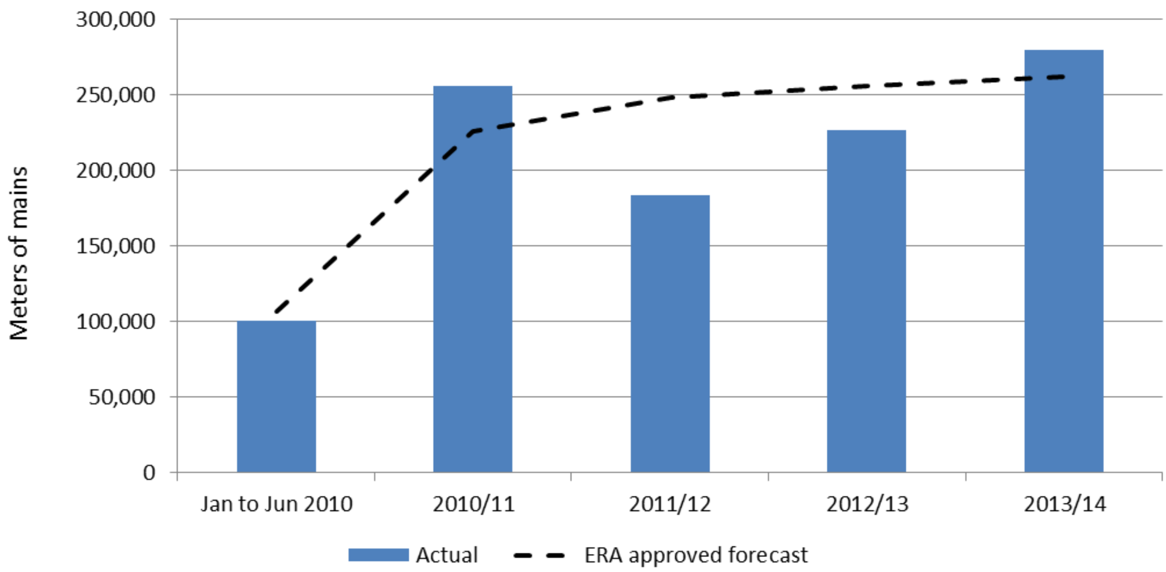
The number of new customer connections started to increase in 2013 but were still below forecast 2010 levels. This is demonstrated in Figure 61 where the actual number of connections is compared with forecast connections.

Figure 61: Actual and forecast new connections 2010-2014



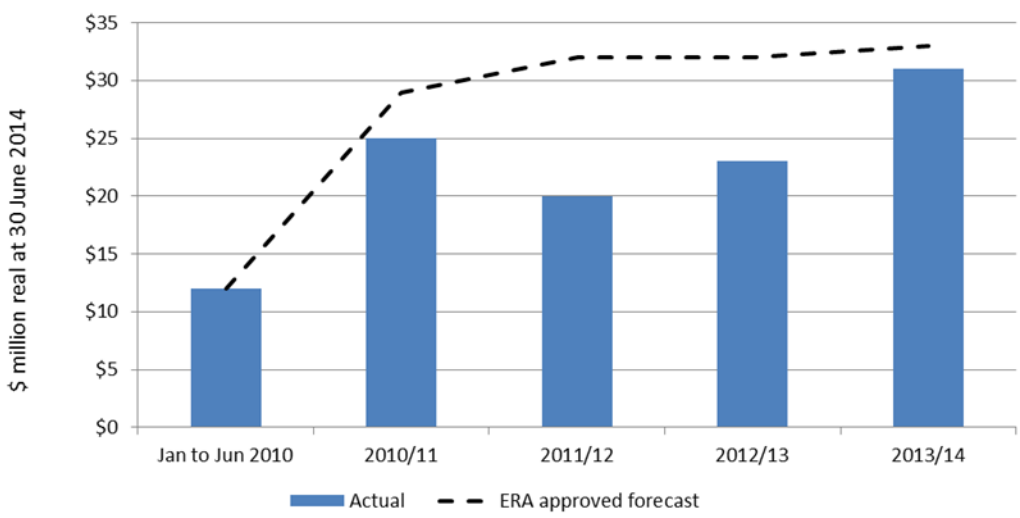
In addition, the number of kilometres of new mains installed decreased significantly from 2010 to 2012 compared to forecast, then gradually recovered over the remainder of the period. The gradual increase in new mains reflects the recovery of the housing market. This is illustrated in Figure 62.

Figure 62: Actual and forecast new mains 2010-2014



The lower than forecast number of connections led to lower costs for mains and connection than forecast in the AA3 determination.

Figure 63: Actual and forecast total costs for new mains and connections 2010-2014



7.6.1 NPV analysis of past growth capital expenditure in compliance with rule 79(2)(b) of the NGR

ATCO Gas Australia submits that the NPV of the net incremental revenue from new end user connections made possible by extension and reinforcement exceeds the present value of the proposed new capital expenditure. Therefore, the growth capital expenditure undertaken and estimated to be undertaken in AA3 complies with NGR 79 (2) of the NGR.

This section presents the NPV analysis and results. The approach adopted is the same as that for the 2010 WAGN Access Arrangement[99], including expressing all dollar values in December 2009 values.

The revenue expected to be generated from the new connections has been calculated using the current reference tariffs for the Network as the 'prevailing reference tariffs'. However, current reference tariffs have been amended to remove the impact of the delay in tariff application, that is, tariffs have been calculated as if the new tariffs had been applied on 1 January 2010. Beyond AA3, reference tariffs have been extrapolated by extending the calculations of the return and depreciation of the asset base, assuming no further investment in the network. If no further investment were made in the Network, the prevailing reference tariffs would decline over time as capital is recovered and the return available on the capital base falls. From the extrapolation outlined above, ATCO Gas Australia has found that total revenue declines at approximately 1.5% annually. In applying the incremental revenue test, the prevailing reference tariffs have been assumed to decline at 2.0% annually from July 2014.

ATCO Gas Australia has used a cash flow model which forecasts incremental net revenue over a period of 30 years. This model assumes no new demand or user initiated capital expenditures during this period. The calculation ignores the replacement of meters and service pipes. If these replacement assets were included, the decline in total revenue would be less than the 2.0% assumed.

Rule 79(4)(c) of the NGR requires that the discount rate to be used in calculating the present values of net incremental revenue and capital expenditure be the rate of return implicit in the reference tariff. The discounting of cash flows within the model is at 7.75% (real pre-tax). This is the rate of return implicit in the calculation of the prevailing reference tariffs.

A proportion of the capital expenditure on the Mandurah lateral and Dampier to Bunbury Natural Gas Pipeline gate station was included in the analysis because it is partly growth related. This project was required to reinforce the distribution sub-network in the Rockingham-Mandurah area to maintain capacity to provide haulage services during severe winter conditions, as well as to eliminate safety issues if pressures fell to the point where gas deliveries could not be maintained and air entered the pipeline system. However, the lateral and gate station were also designed to permit further growth in an area where connections have been growing rapidly.

Table 29 presents ATCO Gas Australia's assessment of growth expenditure against the criterion of rule 79(2)(b) of the NGR.

Table 29: Capital expenditure to be assessed against Rule 79(2)(b)

$ million real at 30 June 2014	Jan to June 2010	2010/11	2011/12	2012/13	2013/14
Demand	2.5	2.3	7.8	13.2	4.6
User Initiated	10.4	23.2	18.1	20.8	28.3
Sub-total	**12.9**	**25.5**	**25.9**	**34.0**	**32.9**
Less Capital Contributions	0.3	2.6	5.8	1.1	1.7
Plus 25% Mandurah lateral and DBNGP Gate Station	2.2	0.7	0.1	-	-
Total capital expenditure to be assessed	**14.8**	**23.6**	**20.2**	**32.9**	**31.2**

[99] Appendix 12: Applying the new capital extension criteria to expansions of the Mid-west South-west gas distribution system, Marsden Jacob, April 2010.

The net incremental revenue expected to be generated from the actual new capital expenditure has been calculated as the number of new connections multiplied by the net incremental revenue per connection. The net incremental revenue per connection is the incremental revenue per connection less the incremental cost per connection.

Table 30 shows numbers of new connections expected for the period 2010 to 2014.

Table 30: Incremental new connections: 2010 to 2014

Tariff class	2010	2011	2012	2013	2014
A1	2	2	6	4	(5)
A2	2	10	1	(1)	4
B1	21	41	44	26	44
B2	230	583	585	552	596
B3	7,899	17,182	13,833	12,982	16,066
Total Incremental	8,154	17,818	14,469	13,563	16,705

Incremental revenue is calculated for each tariff class using the current reference tariffs (adjusted, as discussed above) and the average volume for each tariff class, derived from the 2010-2014 period.[100]

The calculation of incremental costs per customer is derived from:

- Avoidable operations cost estimates[101]
- Unaccounted for gas cost allocations to each tariff class[102]

Incremental revenue analysis indicates that the NPV of the growth investment during AA3 is $29.1 million and the NPV of the investment is positive after 15.5 years. The results of applying the incremental revenue test of Rule 79(2)(b) of the NGR are provided in Table 31 below.

Table 31: Present value of expected net incremental revenue less present value of growth capital expenditure

NPV analysis	$ million real at 30 June 2014
NPV of Net Incremental Revenue	128.9
NPV of capital expenditure	99.8
NPV of Net Incremental Revenue less Capital expenditure	29.1
NPV goes positive after	15.5 years

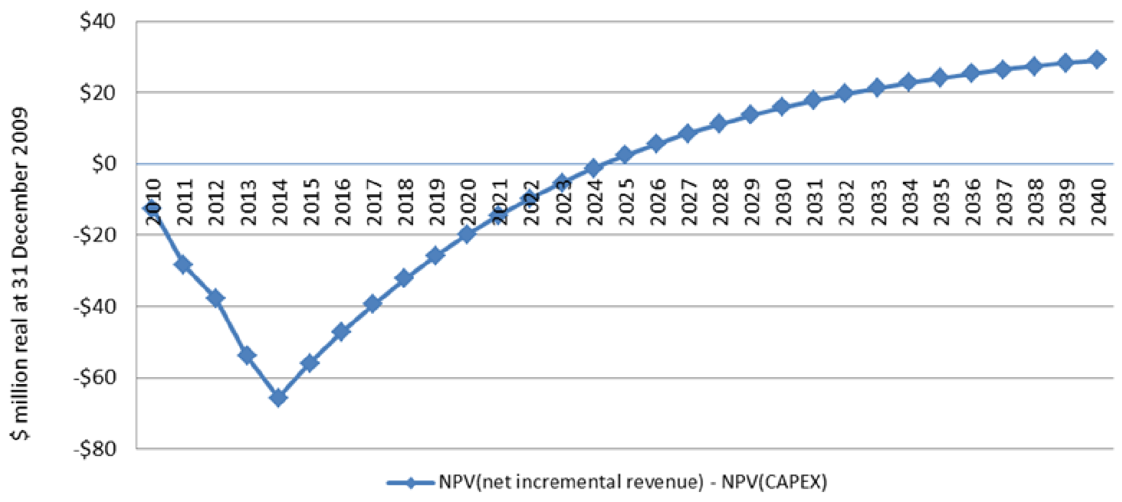
[100] The total number of connections and volumes are derived from the tariff model.

[101] WAGN Submission *Avoidable, stand alone and long run marginal costs*, 15 March 2010, Table 3.

[102] As per the tariff model supporting this access arrangement information.

Figure 64 shows the profile of the NPV of growth capital expenditure over 30 years.

Figure 64: NPV of growth capital expenditure undertaken during AA3 over 30 years



For actual new growth capital expenditure for the period 2010 to 2014, the present value of the expected net incremental revenue is greater than the present value of the capital expenditure and thus is justifiable under rule 79(2)(b) of the NGR.

7.6.2 Customer initiated capital expenditure

Customer initiated capital expenditure includes the cost of connecting new customers and is predominantly driven by customers. Forecasts are based on assumptions about the number of connections by tariff class. Forecast costs for new connections are estimated based on past experience and contractual arrangements in place for extending gas mains to areas with premises being developed for, or currently occupied by, customers or potential customers, and the construction of service pipes from the mains into those premises. In the case of B2 and B3 services, the cost also includes installation of gas meters.

Table 32: Actual and forecast customer initiated capital expenditure during AA3 updated figures

$ million real at 30 June 2014	ERA Approved	AA3 Actual	AA3 Variance
Customer Initiated Capital / User Initiated	135.9	107.4	(28.5)

Table 32 above shows actual customer initiated capital expenditure for the period 2010-2014. The annual variation in the cost per connection is partially due to the mix in the size of gas mains and services actually required in the respective years. As can be seen from the table below the unit costs of mains and services have been below the unit cost forecast approved by the ERA in AA3.

Table 33: Actual and forecast unit cost of new mains: 2010 to 2014

New Mains	Jan to June 2010	2010/11	2011/12	2012/13	2013/14	Total
ERA approved forecast (meters)	107,051	226,001	248,600	255,600	262,200	1,099,451
AA3 actual (meters)	100,226	255,979	183,805	226,724	279,539	1,046,273
ERA approved forecast ($ million real at 30 June)	3.4	11.2	12.4	12.8	13.2	53
AA3 actual ($ million real at 30 June)	3.3	9.4	7.5	9.5	13.5	43.3
ERA approved forecast unit cost ($)	32	49	50	50	50	48
AA3 actual unit cost ($)	33	37	41	42	48	41

Table 34: Actual and forecast unit cost of new services: 2010 to 2014

Services	Jan to June 2010	2010/11	2011/12	2012/13	2013/14	Total
ERA approved forecast (number of connections)	7,911	19,296	21,196	21,696	22,096	92,195
AA3 actual (number of connections)	9,448	19,431	15,956	15,399	19,398	79,632
ERA approved forecast ($ million real)	8.7	17.6	19.2	19.6	20	85
AA3 actual ($ million real)	8.3	15.5	12.5	13.5	17.2	67.1
ERA approved forecast unit cost ($)	1094	912	904	902	906	922
AA3 actual unit cost ($)	880	799	782	877	889	842

(a) New Mains and Services

In 2012, ATCO Gas Australia completed a tender process to market test rates for the installation of new mains extensions and services. This process resulted in new contracting arrangements, incorporating key performance indicators and a performance incentive mechanism to enhance safety, productivity and encourage continuous improvement. A schedule of rates and services has been developed, which ATCO Gas Australia uses to monitor service quality and efficiency and ensure lowest sustainable cost of service. The tender process provided the opportunity to benchmark contracting companies in respect of their rates, their approach to safety and gas utility operations.

ATCO Gas Australia moved from a diverse group of twelve contractors to three principal contractors. Awarding the contract to three principals has improved contractor management and facilitated access to greater resources to deliver the capital works programme.

Gas mains and service run-ins in new developments are installed by means of a common trench with other utility providers installing infrastructure at this time is the most cost effective method of growing the network and connecting new customers and is the preferred connection approach where possible. There are currently 24 common trench contractors who undertake these activities.

An open competitive tender process conducted during June to November 2013 led to a new form of contract modelled on the recently revised mains and services contract issued in January 2014. The expression of interest (EOI) and competitive tender process was open to a wide targeted group of qualified contractors which generated a high standard of bid responses producing detailed price and performance benchmarks.

7.6.3 Demand related capital expenditure

Demand related capital expenditure is for the reinforcement of the network so that it continues to meet hydraulic capacity requirements in the long term. Table shows the demand related projects undertaken during AA3 and provides an explanation for variations to forecast costs where the variation is more than 5%. Projects less than $0.25 million in value have been grouped together as non-material projects (see Table 36). Table 35 shows total demand related expenditure over AA3.

Table 35: Actual and forecast demand capital expenditure during AA3

$ million real at 30 June 2014	ERA Approved	AA3 Actual	AA3 Variance
Demand	54.4	29.2	(25.1)

Table 36: Demand related capital expenditure projects (>$0.25 million): ERA approved forecast and variations

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Projects identified during AA3					
Mandurah Gas Lateral	Mandurah lateral: 16.9 km x 200 mm Class 600 HP steel pipeline to reinforce Rockingham-Mandurah sub network and allow increase in number of connections	Rule 79(2)(a), (b), (c)(i), (c)(iv)	10.5	-	Project reclassed to performance capital expenditure.
Byford to Whitby main extension or Metro HP Development – Whitby	Byford to Whitby High Pressure steel main extension to facilitate increase in number of new connections	Rule 79(2)(a), (b)	6.5	7.0	Project scope changed to pipeline extension to service future demand levels in the region. Project was subsequently revised and re-scoped and was delivered as per the revised business case which showed that NPV for the project was positive.

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Busselton CL150 High Pressure Capel steel pipeline and Pressure Reduction Site installation	Extend 5 km x Class 150 HP steel pipeline, and install pressure reduction facilities to allow increase in number of connections	Rule 79(2)(a), (b)	5.9	0	Slower than forecast growth in new connections due to the downturn in the housing market resulted in project deferral to AA4
Furnissdale CL150 High Pressure steel pipeline from the proposed Mandurah lateral in Parklands to Furnissdale	Extend 150 mm Class 150 steel pipeline from proposed Mandurah lateral in Parklands to Furnissdale to allow increase in number of connections	Rule 79(2)(a), (b)	5.5	0	Slower than forecast growth in new connections due to the downturn in the housing market and deferral of industrial development resulted in the project being re-scoped and deferred. This project has been re – scoped as part of the Spur Line – Peel Region long term residential and commercial development in the region scheduled for AA4
Pinjarra CL150 High Pressure steel pipeline	Extend 7.2 km x 150 mm Class150 pipeline from Pinjarra Gate Station to regulator set HS017 to allow operating pressure to be increased from 600 kPa to 900 kPa, ensuring continuity of supply during winter conditions	Rule 79 (2)(a),(b)	4.7	0	This project has been re – scoped as part of the Spur Line – Peel Region long term residential and commercial development in the region scheduled for AA4. Slower than forecast growth in new connections due to the downturn in the housing market resulted in project deferral to AA4. Byford to Whitby High Pressure steel main extension to facilitate increase in number of new connections

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Baldivis CL150 High Pressure steel pipeline	Extend 150 mm Class 150 steel pipeline from the intersection of Wellard Road and Gilmore Avenue to Baldivis to allow increase in number of connections	Rule 79 (1)(a), (2)(a)	4.7	0	Slower than forecast growth in new connections due to the downturn in the housing market resulted in project deferral to AA4
Ellenbrook CL150 High Pressure steel pipeline	Ellenbrook high pressure steel main extension to allow increase in number of connections	Rule 79(2)(a), (b)	4.4	3.1	Revised project scope and cost estimate developed for the business case was refined in 2012 to meet revised future demand estimates identified in the region. The project was subsequently delivered as per the revised business case
Mandurah gate station	Gate station on Dampier to Bunbury Natural Gas Pipeline to allow gas delivery into the Mandurah lateral	Rule 79(2)(a), (b), (c)(i),(ii),(iv)	2.7	2.3	Following negotiations with the Dampier Bunbury Pipeline (DBP) a reduced cost for the infrastructure was agree and project was delivered as per the 2011 revised business case
Headworks upgrading	Upgrading of pipelines to facilitate forecast growth in number of customer connections across network	Rule 79(2)(a), (b)	2.7	1.1	Headworks were budgeted as a provisional measure to supply gas to developments that jump the distribution front. At the time of budgeting, these developments are unknown and the extent of headworks is also unknown. Slower than forecast growth of the network resulted in reduced expenditure than forecast.
Alkimos pipeline reinforcement	New pipeline to supply gas to development s jumping the normal distribution front.	Rule 79(2)(a), (b)	1.3	0.8	Reduced project costs due to the use of common trenching which is a more cost effective method of installation. Delivered as per the revised 2013 business case

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Drummond Cove (Glenfield) Reinforcement	Glenfield (Geraldton) main extension: extend 3.2 km x 160 PE SDR17.6 PE80B medium pressure main to reinforce Glenfield area and allow increase in number of connections	Rule 79 (2)(a)(b)(c)(i)(iv)	0.7	0	Reduced project costs due to the use of common trenching which is a more cost effective method of installation. Delivered as per the revised 2013 business case
Medium pressure regulator set capacity upgrades	Upgrading of high pressure regulator sets at network locations at which system modelling has identified a significant pressure reduction and a requirement for additional capacity	Rule 79(2)(a), (b)	0.5	0.5	Delivered as per Asset Management Plan in each respective year

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Reinforcement - Chapman Rd, Beresford	Beresford Main Extension: extend 300m x 110PE along Chapman Rd and 1660m x 160PE SDR17.6 PE80B along North West Coastal Hwy to connect to 160PE on Flores Rd short main extension required to compensate for pressure drop identified in system modelling studies	Rule 79 (2)(a)(b)(c)(ii)(iv)	0.4	0.3	Change of route during construction resulted in a shorter main extension leading to a cost saving compared to forecast
High pressure regulator set capacity upgrades	Upgrading of high pressure regulator sets at network locations at which system modelling has identified a significant pressure reduction and a requirement for additional capacity	Rule 79(2)(a), (b)	0.3	0.3	Delivered as per Asset Management Plan in each respective year
Brand Highway main extension or Tarcoola Beach Main Extension	Extend 1.5 km x PE along Brand Highway and connect into 100 PVC MP main along Columbus Boulevard, Geraldton	Rule 79(2)(a), (b)	0.3	0.4	Revised 2014 business case to reflect current construction cost which exceeds original estimate.

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Australind main extension or Eaton/Millbridge Reinforcement	Australind main extension & regulator set to connect new customers	Rule 79(2)(a), (b)	0.3	0.4	Project scope changed to accommodate Main Roads requests, resulting in increased length. The project was delivered in line with the revised business case.
South Yunderup/ Austin Lakes extension reinforcement	Extension of mains network to new subdivision	Rule 79(2)(a), (b)	0.2	2.5	Initial project was to supply gas from existing MP main to accommodate existing development. The project was re-designed to a high pressure specification and increased in length to meet future demands for the region, the revised estimate was included in the 2012 business case. The business case shows that the revised project returns a positive NPV. Project scope changed to accommodate Main Roads requests, resulting in increased length. The project was delivered in line with the revised business case.
Total Demand related capital expenditure on projects identified in the AA3 revision process			**51.8**	**18.6**	
Projects not identified during AA3					
Two Rocks	11km x high pressure PE pipeline to accommodate demand	Rule 79 (2)(a)(b)	-	4.0	Network extension to new residential development area was identified after AA3 submission and was delivered as per 2012 business case.
Yanchep main extension	2.85km poly-ethylene (PE) to connect new developments in Yanchep to the distribution network	Rule 79 (2)(a)(b)	-	1.8	Network extension to connect new and existing residential developments was identified after AA3 submission and was delivered as per 2013 business case.

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Latitude 32 main extension	3.25km of PE gas mains and two Pressure Reduction Stations (PRS) for the provision of natural gas to Landcorp's Latitude 32 commercial development.	Rule 79 (2)(a)(b)	-	0.9	Network extension to new commercial development area was identified after AA3 submission and was delivered as per 2012 business case.
Oakford & Forrestdale main extension	Main extension of 3.8km of PE to supply gas to the Oakford and Forrestdale developments	Rule 79 (2)(a)(b)	-	0.9	Network extension to new residential development area was identified after AA3 submission and delivered as per 2013 business case.
Mains extension - Sunrise, East Wellard	Installing 875m of poly-ethylene (PE) to connect new customers to the network..	Rule 79 (2)(a)(b)	-	0.3	Network extension to new residential development area was identified after AA3 submission and delivered as per 2013 business case..
Network Reinforcement - Beryl St, Balcatta	Reinforcement to support growth in the network - Beryl St, Balcatta	Rule 79 (2)(a)(b)(c)(ii)(iv)	-	0.3	Required reinforcement was identified after AA3 submission and was delivered as per 2014 business case.
Total Demand related capital expenditure on projects not identified during the AA3 revision process			**-**	**8.2**	

The table below presents the number of non-material demand related capital expenditure projects (<$0.25million).

Table 37: Demand related capital expenditure projects less than <$0.25 million

($ million real at 30 June 2014)	Number AA3 approved	Total costs AA3 approved ($ million real at 30 June 2014)	Number AA3 Actuals	Total costs AA3 Actuals ($ million real at 30 June 2014)	Comments
Demand Projects <$0.25M	4	0.4	13	0.4	For example: Installation of regulator set at Aspiri-Piara Water, other minor mains extension jobs and upgrades to pressure regulator sets.
Capacity upgrades of domestic and commercial meters and service relays	-	2.2	-	2.0	These are classed as Variable Volume activities and costs were lower than forecast due to lower than anticipated activity levels.

In summary, ATCO Gas Australia spent $29.2 million on demand related capital expenditure over the AA3 period. This was $25.1 million less than forecast.

Table 38: Total expenditure: Demand capital expenditure over AA3

($ million real at 30 June 2014)	Total costs AA3 approved ($ million real at 30 June 2014)	Total costs AA3 Actuals ($ million real at 30 June 2014)	Variance ($ million real at30 June 2014)
Sum of demand related capital expenditure	**54.4**	**29.2**	**(25.1)**

7.7 Sustaining capital expenditure

Expenditure of sustaining capital was greater than forecast for the AA3 period. The most significant drivers of the variation result from new requirements arising from FSAs undertaken as a part of the Safety Case. Table 39 shows the ERA approved forecast compared with the actual AA3 expenditure.

Table 39: Actual and forecast sustaining capital expenditure over AA3

$ million real at 30 June 2014	ERA Approved	Actual/Forecast	Variance
Sustaining capital expenditure	51.9	81.2	29.3

The FSAs conducted as part of the Safety Case resulted in expenditure required to:

- Replace end of life, unprotected buried metallic mains (asset replacement capital expenditure)
- Replace distribution infrastructure within multistorey buildings (asset replacement capital expenditure)
- Install concrete barriers to protect high pressure pipelines from excavation strikes (performance and safety capital expenditure)

- Install over pressure shut off devices on high pressure regulating equipment (performance and safety capital expenditure)

The FSA of unprotected metallic mains (including ageing steel and galvanised iron mains) identified that they either had ineffective coating or were unprotected by sacrificial or impressed current cathodic protection system. These mains were installed between 1915 and the 1960s. The mean annual leak rate for unprotected steel mains is more than ten times the average leak rate for the rest of the Network. The FSA identified that the risk associated with these assets is not as low as reasonably practicable due to the risk of loss of containment and leak tracking into a building. ATCO Gas Australia therefore commenced a risk based programme of replacement of unprotected metallic mains which will continue into AA4.

FSAs also identified the risk of gas leakage and consequences associated with infrastructure within multistorey buildings as not being as low as reasonably practicable. ATCO Gas Australia engaged with Energy*Safety* to develop a solution that would reduce the risks associated with these assets. A risk based programme of replacement of assets in multistorey buildings has commenced and will continue into AA4.

Installing concrete barriers is a preventative measure to protect high pressure pipelines in sensitive locations (eg. schools, hospitals, aged care facilities, etc.) from impact of third party strikes. The Safety Case identified the network risk was not as low as reasonably practicable, therefore ATCO Gas Australia commenced a programme to address the risk.

As required by AS/NZS 4645 and AS 2885 ATCO Gas Australia installed over pressure shut off (OPSO) devices, which protect the downstream gas distribution network from exceeding the maximum allowable operating pressure. The OPSO devices mitigate the risk of network damage and/or significant release of gas if over pressurisation was to occur.

The increased expenditure associated with each of these projects is presented in the following sections.

7.7.1 Asset replacement capital expenditure

The main asset replacement programmes during AA3 were cast iron mains in Fremantle, odd sized unprotected steel mains across the network, gas meters and the Jandakot operations centre. Other miscellaneous assets that have been replaced include telemetry, valves, pits and corrosion protection equipment. Table 40 shows the ERA approved forecast compared to the actual AA3 expenditure.

Table 40: Actual and forecast asset replacement capital expenditure over AA3

$ million real at 30 June 2014	ERA Approved	Actual/Forecast	Variance
Asset replacement	51.1	57.3	6.3

Table 41 shows the asset replacement projects undertaken during AA3 and provides explanation for variations to forecast costs where the variation is more than 5%. Projects less than $0.25 million in value have been grouped together as non-material projects (see Table 42).

Table 41: Asset replacement capital expenditure projects (>$0.25 million): ERA approved forecast and variations

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Projects identified during AA3 revision process					
Cast iron pipeline replacement	ATCO Gas Australia operates cast iron with embedded unprotected steel within the Fremantle area. These assets have reached their end of life.	Rule 79(2)(c)(i),(ii),(iv)	14.6	15.2	The increase in expenditure is reflecting the higher construction costs due unexpected hard ground conditions. Each respective year is delivered in line with business cases as revised and approved.
Replacement of ME602 and M6EW gas meters	Replacement of ME602 and M6EW meters which have now been, or which will have been at the time of replacement, in service for a period exceeding their regulated service lives	Rule 79(2)(c)(iii)	11.6	10.3	There was a reduced volume of meters requiring replacement due to unused meters, whereby the meter is removed and a new meter was not required. Project has been delivered in line with business cases as revised and approved for each respective year.
Jandakot Operational Centre	Jandakot depot redevelopment: Constructi on of office facility at Jandakot to allow all staff to be located at a single site.	Rule 79(2)(a)(c)(i)(ii)(iii)	10.4	-	Project reclassified. Please refer to Structures & Equipment below.
Replacement of unprotected and odd–sized steel pipelines	ATCO Gas Australia identified odd size unprotected steel mains as not ALARP, due to the inability to isolate a localized section with standard flow stopping equipment, particularly in the case of emergency repairs.	Rule 79(2)(c)(i)(ii)	6.4	17.8	The increase in expenditure is reflecting the requirement arising from FSA as part of Safety Case to replace an additional 4km per year over AA3. Projects are delivered in line with business cases for each respective year.
Slabbing of High Pressure Pipelines	Slabbing to meet requirements of AS 2885: concrete covering of HP pipelines in sensitive locations as a safety	Rule 79(2)(c)(i),(ii),(iii)	3.5	-	Project reclassified to performance capital expenditure (refer to Performance

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
	measure				section).
Replacement of older pipelines and remediation work – (EOL Metallic Mains)	Replacement of pipelines at their end of life.	Rule 79(2)(c)(i)(ii)	1.7	2.5	The increase in expenditure is reflecting a higher rate of replacement as a result of the implementation of the Safety Case requirement for an FSA to be carried out. Outcome from FSA presented a risk which is not ALARP. Projects are delivered in line with business cases for each respective year.
Pressure monitoring data visualisation	Pressure monitoring data visualisation: project to facilitate dynamic monitoring of pressure across the network for strategic asset management	Rule 79(2)(c)(i)(ii)	1.2	-	Project reclassified as IT in AA3. Forecast expenditure to June 2014 is $1.1m. The project phasing is slightly slower than anticipated.
Telemetry replacement	Replacement of flow computers, transducers, data loggers and communications equipment which have reached end of life.	Rule 79(2)(c)(i)(ii)	0.7	-	Project reclassified as IT in AA3. See the IT capital expenditure section below.
Total asset replacement capital expenditure on projects identified in the AA3 revision process			**50.1**	**45.8**	
Projects not identified during AA3 revision process					

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Multistorey Buildings	To reduce risk to 'as low as reasonably practicable' (ALARP) for the operation and maintenance of gas infrastructure in multistorey buildings.	Rule 79 (2)(c)(i)(ii)	-	7.1	Project required due to assessment of risk as not being ALARP which was identified during the Safety Case FSA. Project delivered in line with respective business case budgets.
Replacement of M6WA meters with plugs	To reduce risk to 'as low as reasonably practicable' (ALARP) for meters with identified faulty plugs.	Rule 79 (2)(c)(i)(ii)	-	2.2	Project required due to assessment of risk as not being ALARP which was identified during the Safety Case FSA. Project delivered in line with each year's respective business case.
End of Life mains replacement	Replacement of mains identified by leak frequency review and performing a condition assessment on a main while responding to leaks	Rule 79 (2)(c)(i)(ii)	-	0.5	Project required due to on site condition and risk assessment and delivered in line with respective business case.
Total asset replacement capital expenditure on projects not identified during the AA3 revision process			**-**	**9.8**	

Table 42 shows number of non-material replacement related capital expenditure projects (<$0.25million).

Table 42: Asset replacement capital expenditure projects less than <$0.25 million

$ million real at 30 June 2014	Number of projects AA3 approved <$0.25M	Total costs AA3 approved	Number of projects AA3 actual <$0.25M	Total costs AA3 actual	Comments
Asset Replacement Projects	8	0.9	20	1.6	HP Valve replacements, medium pressure pit replacements, isolation valves, anodes, Transformer Rectifier Units

Table 43 presents a summary of asset replacement capital expenditure over AA3.

Table 43: Total expenditure: Asset Replacement capital expenditure over AA3

($ million real at 30 June 2014)	Total costs AA3 approved ($ million real at 30 June 2014)	Total costs AA3 Actuals ($ million real at 30 June 2014)	Variance ($ million real at 30 June 2014)
Sum of all Asset Replacement Projects	**51.1**	**57.3**	**6.3**

7.7.2 Performance and safety capital expenditure

Network performance and safety capital expenditure consists of projects to upgrade and improve network assets or operations to meet safety, reliability or cost effectiveness requirements. Examples are the installation of Over Pressure Shut-Off (OPSO) devices to mitigate the risks of high pressure gas entering lower pressure networks and installing concrete barriers around the high pressure network in sensitive locations. Table 44 shows the ERA approved forecast compared to actual AA3 expenditure.

The table below shows actual versus ERA approved forecast expenditure in the asset performance and safety category. It should be noted that a number of projects such as Mandurah Gas Lateral and pipeline slabbing centre were forecast in other categories in AA3 but have since been reclassified. Details are provided in Table 45.

Table 44: Actual and forecast asset performance and safety capital expenditure over AA3

$ million real at 30 June 2014	ERA Approved	Actual/Forecast	Variance
Asset performance and safety	0.8	23.8	23.0

Table 45 shows network performance and safety projects undertaken during AA3 and provides an explanation for variations to forecast costs where the variation is more than 5%. Projects less than $0.25 million in value have been grouped together as non-material projects (see Table 46).

Table 45: Asset performance and safety capital expenditure projects (>$0.25 million): ERA approved forecast and variations

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Projects identified during AA3 revision process					
Mandurah Gas Lateral	Mandurah lateral: 16.9 km x 200 mm Class 600 HP steel pipeline to reinforce Rockingham-Mandurah subnetwork and allow increase in number of connections	Rule 79(2)(a), (b),(c)(i), (c)(iv)	-	11.0	Project classed as Demand in AA3. Delivered as per Business Case 2011 to meet growing demand and provide security of supply for the region.
Slabbing of High Pressure Pipelines	Slabbing to meet requirements of AS 2885: concrete covering of HP pipelines in sensitive locations as a safety measure	Rule 79(2)(c)(i), (iii)	-	9.0	Project scope was increased following further detailed analysis of qualifying sensitive location areas in accordance with the AS 2885 Standard requirement. The resulting cost revision was included in the business

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
					case and was delivered in line with business case budget.
Total asset performance and safety capital expenditure on projects identified in the AA3 revision process			**-**	**19.9**	
Projects not identified during AA3 revision process					
OPSO safety devices	To install over pressure protection devices at pressure regulation sites to maintain the safe operation of the gas distribution network and comply with requirements of AS/NZS 4645.	Rule 79 (2)(c)(i)(ii)(iii)	-	1.6	Project was not identified prior to AA3. Project was required due to assessment of risk identified with the technical Regulator Energy*Safety* not being ALARP. Project delivered in line with business case.
In line inspection of high pressure pipelines	Facilities and inline inspection of High Pressure Pipeline No.120 , Mandurah Gas Lateral. These works are required to comply with regulatory obligations for pipeline inspection as nominated in Section 3.3 of the Pipeline Licence 83 (PL83).	Rule 79 (2)(c)(i)(ii)(iii)	-	0.5	Project was not identified prior to AA3 but is a regulatory requirement. Project delivered in line with business case budget.
High pressure signs	AS2885 HP Signs - Compliance to New Requirements	Rule 79 (2)(c)(i)(ii)(iii)	-	0.4	Project was not identified prior to AA3 but is a regulatory requirement. Project delivered in line with business case budget
UAFG turbine meters	Replacement of oversized turbine meters.	Rule 79 (2)(c)(iii)	-	0.3	Project was not identified prior to AA3 but was required to ensure compliance with regulations and to reduce Unaccounted for Gas. Project delivered in line with business case budget.
Total asset performance and safety capital expenditure on projects not identified during the AA3 revision process			-	**2.7**	

Table 46 shows the non-material asset performance and safety related capital expenditure projects (<$0.25million).

Table 46: Asset performance and safety capital expenditure projects less than <$0.25 million

$ million real at 30 June 2014	Number of projects AA3 approved <$0.25M	Total costs AA3 approved	Number of projects AA3 actual <$0.25M	Total costs AA3 actual	Comments
Asset performance and safety projects	5	0.8	15	1.1	Includes projects such as regulator pit remediation, installation of surge protectors, and installation of pipeline signs, improving alarming capabilities of regulating equipment, installation of vent line at metering equipment.

Table 47: Total expenditure: Asset performance and safety capital expenditure over AA3

($ million real at 30 June 2014)	Total costs AA3 approved ($ million real at 30 June 2014)	Total costs AA3 Actuals ($ million real at 30 June 2014)	Variance ($ million real at 30 June 2014)
Sum of asset performance and safety projects	**0.8**	**23.8**	**23.0**

7.7.3 Structures and equipment capital expenditure

This expenditure is the cost associated with operating depots, fleet, plant and equipment. Expenditure includes:

- **Fleet**: expenditure on, vans, utilities, trucks, motorbikes, trailers, compressors, excavators and passenger vehicles

- **Plant and equipment**: expenditure such as high and low pressure flow-stopping equipment, underground services detection equipment, gas detectors and polyethylene welding equipment

- **Operational depots**: expenditure required to establish office buildings and operational depots to enable emergency response times to be met and provide the lowest cost of providing operational and support requirements over the long term.

The table below shows actual versus ERA approved forecast expenditure in the Structures and Equipment category. It should be noted that a number of projects such as Jandakot Operating centre and other operating depots were forecast in other categories in AA3 but have since been reclassified. Details are provided in Table 49.

Table 48: Actual and forecast structures & equipment capital expenditure over AA3

$ million real at 30 June 2014	ERA Approved	Actual/Forecast	Variance
Structures & Equipment	1.4	33.5	32.1

Table 48 provides a summary of the structures and equipment capital expenditure over AA3.

Table 49: Structures and equipment capital expenditure ERA approved forecast, actual and estimate for AA3

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Projects identified during AA3 revision process					
Jandakot Operational Centre	Jandakot depot redevelopment: Construction of office facility at Jandakot to allow all staff to be located at a single site.	Rule 79(2)(a)(c)(i)(ii)(iii)	-	14.0	Project was classed as Asset Replacement in AA3. A new office building was required to accommodate all office based employees in one location.
Eglinton depot	Depot facilities for servicing of faults in the northern part of the Perth metropolitan area, allowing response to pipeline breaks in less than 1 hour	Rule 79(2)(a)(c)(i)	0.7	-	Deferred until 2015 due to the slower than anticipated growth of the network footprint. Depot location revised to Joondalup.
Mardella depot	Depot facilities for servicing of faults in the southern part of the Perth metropolitan area, allowing response to pipeline breaks in less than 1 hour	Rule 79(2)(a)(c)(i)	0.7	1.1	It is forecast in the first half of 2014 that the new Mandurah depot is required to support the servicing of faults in the southern region. In developing the business case it was identified that the current cost of land and construction is higher than forecast in AA3.
Jandakot Blue Flame Kitchen	Construction of a natural gas showcase kitchen to drive the safe responsible usage of natural gas through its direct use and uptake in gas powered appliances for customers to get the best value for their energy dollar	Rule 79(2)(a)(b) (c)(i)(iii)	-	0.8	This was delivered as part of the new office building in Jandakot which showcases new gas technologies and will progress the strategy to market the benefits of natural gas and safety awareness of gas to both the Company's existing and potential new customers.
Jandakot sewerage extension	Connection of the existing Jandakot site to deep mains sewage to avoid potential future compliance issues with existing on site treatment of sewage.	Rule 79 (2)(c)(i)(iii)	-	0.7	The Jandakot site is within a Priority 2 Drinking Water Zone. This classification imposes obligations on owners of such sites to ensure the protection from potential contaminants to the drinking water supply. Costs for the mains sewage extension project were shared with DBP and Western Power thereby ensuring a lowest cost solution was achieved.

Project name	Project description	Regulatory justification to Rule 79(2)	ERA approved forecast ($ million real at 30 June 2014)	Actual ($ million real at 30 June 2014)	Comments
Jandakot - Warehouse Redevelopment	Existing operational facilities, including warehouse, gas testing and stores areas, which have been in place for more than 25 years, are to be rationalised and upgraded to ensure compliance to occupational health and safety requirements,	Rule 79 (2)(c)(i)(ii)(iii)	-	0.7	Project was not identified prior to AA3. This project is required to upgrade operational facilities of the Jandakot depot to ensure services can continue to be delivered safely.
Wangara Depot Upgrade	Existing operational facilities, including warehouse, offices and meeting rooms were upgraded to ensure compliance to occupational health and safety requirements,	Rule 79 (2)(c)(i)(ii)(iii)	-	0.1	Project was not identified prior to AA3. This project is required to upgrade operational facilities of the Jandakot depot to ensure services can continue to be delivered safely.
Fleet and Equipment	Purchase of custom designed operational fleet, supporting plant and equipment to deliver the safe and reliable growth, operation and maintenance of the Network	Rule 79 (2)(a)(c)(i)(ii)	-	16.1	ATCO Gas Australia moved from a leasing to an ownership strategy for Fleet to reduce the cost of services to customers over the long term. There was also a requirement for additional operational plant and equipment to ensure activities were carried out in accordance with the Safety Case.
Total asset performance and safety capital expenditure on projects identified in the AA3 revision process			**1.4**	**33.5**	

The increase in the costs of fleet compared to forecast was due to purchase of fleet vehicles more cost effective in the long term than continuing to lease. ATCO Gas Australia's fleet is comprised of custom-designed passenger vehicles, vans, utilities, trucks, motorbikes, trailers, compressors and excavators. Owning its own fleet improves ATCO Gas Australia's ability to ensure the fleet is reliable and can meet emergency response timeframes as the Network grows.

Fleet ownership and management achieves the lowest sustainable cost of providing services over the longer term based on a net present value assessment.

Ownership creates efficiencies in vehicle usage through the interchange of vehicles made possible by the use of common purpose-built vehicle types. Fleet ownership also reduces the risk of increasing lease costs, inertia costs and 'over kilometre' costs when leased vehicles are not replaced in a timely manner.

Operational plant and equipment is critical to safely undertake planned and reactive operational activities. Typical plant and equipment is as follows:

- **Flow stopping –** This equipment is used to safely stop the flow of gas when isolating a section of gas mains for such things as connecting new subdivisions to grow the network, to accommodate network alterations and to isolate the supply of gas in the event of an emergency. It encompasses a variety of equipment to flow stop the different material types such as metallic, PVC and Polyethylene mains across the different pressure ranges on the network.

- **Underground asset detection** – Consistent with good industry practice this equipment is used to assist in the prevention of damage to underground infrastructure by identifying and locating underground assets prior to, and during, excavation activities. Prevention of underground damage is essential to mitigate the risks to personnel and the general public and of underground asset strikes, as well as prevent interruptions to supply of other underground asset owners and their customers.

- **Gas detector units** – These units are essential to ensure successful commissioning and decommissioning activities by accurately reading gas levels, and therefore preventing an uncontrolled gas and air mixture that could potentially be explosive. Units are also used in locating and classifying gas leaks on the asset and are a key tool in safe guarding both people and property

- **Polyethylene welding and fusion –** Consistent with good industry practice the new gas network is predominantly constructed using polyethylene. To ensure that joining new pipes together, or welding on fittings to facilitate operational activities, this equipment is essential.

- **Pressure testing –** To ensure compliance with AS/NZS 4645 and AS 2885 testing requirements, assets are pressure tested to ensure they are fit for purpose. The different operating pressures of the network require different equipment to ensure compliance to these requirements.

- **Fleet fit out** – After the purchase of new fleet vehicles they must have all necessary equipment to ensure it is operationally ready and fit for purpose before being utilised by personnel.

Expenditure is undertaken consistent with ATCO Gas Australia's Procurement Policy.

ATCO Gas Australia has constructed a new building on its existing site at Jandakot to enable all of its employees to be located in one facility, effectively relocating its head office to the existing operational site at Jandakot. The decision to consolidate all staff and operations at one site will:

- Accommodate the expected growth in ATCO Gas Australia's staff number

- Avoid the travel costs associated with staff moving between locations and the costs associated with the current head office premises in Perth CBD

- Improve staff productivity and effectiveness by integrating staff undertaking dependent functions and sharing information across the business

- Promote use of natural gas through a purpose built demonstration centre, natural gas vehicle refuelling facility and gas powered air-conditioning

The forecast cost of the development is $14.0 million. The project was identified to have a positive NPV of nearly $3 million.

7.7.4 IT capital expenditure

ATCO Gas Australia invested capital of $18.2 million during AA3 compared to the ERA approved forecast of $17.8 million.

In addition to the $17.8 million IT capital expenditure forecast an additional $1.9 million for network telemetry equipment replacement was approved by the ERA in the Network Asset Replacement forecast for AA3. Capital expenditure for telemetry equipment has been reclassified as IT capital expenditure as shown in Table 50 below.

Table 50: IT capital expenditure ERA approved forecast, actual and estimate for AA3

$ million real at 30 June 2014	ERA approved forecast	Actual/Forecast
IT capital expenditure	17.8	18.2

IT Projects slightly overspent by $0.4 million largely due to reclassification of telemetry replacement as IT capital expenditure.

The following key projects were implemented in the AA3 period: a) Field Mobility, b) Network Data Visualisation (NDV), c) Gas Distribution Billing Data Verification (GDBDV) / Gas Monitoring Data (GMD) replacement; and d) Neon Interval Metering.

A number of projects such as NMIS Application upgrade and Strategic Asset Management have been deferred to the AA4 period.

Table 51 shows the difference in costs incurred compared to ERA approved forecasts and brief explanation of the variance.

Table 51: IT capital expenditure 2010-2014 ($ million, 30 June 2014)

Project name	Project Description	Regulatory Justification	AA3 approved real 2014 $million	AA3 actuals real 2014 $million	Comments
Network Data Visualisation (NDV)	Solution providing a graphical representation of the distribution network's hydraulic performance using near-real-time statistics. The system also has functionality to track location of field vehicles to facilitate works management activities for assignment and planning.	Rule 79(2)(c)(ii)	0.85	2.6	The original scope of NDV Project was delivered under Phase I. Actual spend was higher than forecast in AA3 due to delivery of additional scope detailed in NDV Phase II (2012) and Request for Enhancement Project (2013). Phase II of the project involved scoping and developing the 'network modelling' stream. The modelling stream integrates near-real-time data with simulated network activities particularly in the area of network emergency response management e.g. (curtailment scenario) to deliver a holistic decision making solution.
ESRI upgrade (GIS)	Project to upgrade ATCO Gas Australia's GIS suite of	Rule 79(2)(c)(ii)	0.46	2.8	Phase I included scoping, designing and building a prototype of using Geocortex product.

Project name	Project Description	Regulatory Justification	AA3 approved real 2014 $million	AA3 actuals real 2014 $million	Comments
	applications. The application graphically displays and enables updates to ATCO Gas Australia's distribution assets and stores legal cadastral block information.				Additional un-scoped AA3 project items included: • Rectification of performance issues relating to database design and infrastructure; • Rectification of the GNIS data mapping 'gap' issue between Perth and Kalgoorlie; • Re-development of NDV using the new Geocortex as the standard platform; and • Alignment of project to timeframe and requirements as defined from the over-arching Infrastructure Upgrade project. These un-scoped items were required to ensure data integrity and provision of accurate plans of network pipeline assets.
GIS enhancements	Project to apply functional enhancements to the ESRI suite of applications for business and regulatory purposes.	Rule 79(2)(c)(ii)	0.46	0.65	Continued enhancements to ATCO Gas Australia's GIS suite of applications. Major initiatives completed: • Cadastral updates • Synchronisation of functional locations between NMIS/SAP/GNIS
Engineering drawing management system (EDMS)	Implement a centralised EDMS to manage engineering documents.	Rule 79(2)(c)(i)(ii)(iii)	0.4	0.01	Reduced requirement to upgrade the Brava CAD software for Drawing Office.
EDMS upgrade	Upgrade EDMS to most reasonable supported software versions.	Rule 79(2)(c)(ii)	0.17	0	Upgrade was not required.
Metering & billing enhancements (Market)	Project to enhance Metering and Billing applications for market purposes.	Rule 79(2)(c)(ii)	0.82	0.55	Continued enhancements to ATCO Gas Australia's Market systems (NMIS/GDBDV/GMD/GIMS/Neon). Major initiatives completed: • MIRN register • Integration between Neon/NM-Reads/GDBDV • GDBDV & GMD Enhancements • MIRN Discovery Tool

Project name	Project Description	Regulatory Justification	AA3 approved real 2014 $million	AA3 actuals real 2014 $million	Comments
					• webMethods Upgrade Scope of project was delivered in-line with revised Business Case.
Metering & billing enhancements (Regulatory)	Project to enhance Metering and Billing applications for regulatory requirements.	Rule 79(2)(c)(ii)	0.8	0.43	Continued enhancements to ATCO Gas Australia's systems to comply with Regulatory obligations and requirements. Major initiatives include: • PCF Tool • UAFG • NMIS Enumerations Update • BAR RemCo Balancing & Reconciliation Reports • Leak Survey Tracking Scope of project was delivered in-line with revised Business Case.
Upgrade interval metering software (Neon)	Upgrade and migrate existing ATCO Gas Australia telemetry devices to Neon Remote Terminal technology. Scope included 235 Industrial sites and 34 Pressure Monitoring sites.	Rule 79(2)(c)(ii)	0.12	0.27	Completed the migration of telemetered sites to Neon Remote Terminal (NRT) technology enabling GPRS technology. Significantly reduced time to retrieve daily interval metering data.
GDBDV/GMD Replacement	Replacement project identified to address operational risk and support redundancy. Both applications were running on old technology that had a high risk of being unsupportable due to the retiring technology platform (Ingres).	Rule 79(2)(c)(ii)	0.42	2.5	ATCO Gas Australia purchased the business after project commencement and delivered the outcome consistent with the scope of the original business case. ATCO Gas Australia was unable to reconcile the original estimate with the scope identified however the project was delivered in-line with the revised business case estimate.
NMIS application upgrade	Project identified to upgrade NMIS to the most reasonable supported database and operating system level.	Rule 79(2)(c)(ii)	2.3	0	Not completed due to business re-prioritisation due WNG divestment of assets and sales process which resulted in deferment of project to AA4.

Project name	Project Description	Regulatory Justification	AA3 approved real 2014 $million	AA3 actuals real 2014 $million	Comments
NMIS archiving	Archive large transactional tables identified within the NMIS database for performance reasons.	Rule 79(2)(c)(ii)	0.23	0	Not completed due to Business re-prioritisation due WNG divestment of assets and sales process which resulted in deferment of project to AA4.
Field mobility	Project involving the deployment of mobile devices to field based employees enabling electronic despatch of work.	Rule 79(2)(c)(i)(ii)(iii)	4.57	4.67	Minor delays in phasing of project
Strategic asset management	Implement a solution to support the long term strategic asset management and life cycle maintenance of ATCO Gas Australia's assets.	Rule 79(2)(c)(ii)	3.4	0.01	Project was scoped during AA3 but has been deferred to AA4
Jandakot office development	IT infrastructure required for the Jandakot office redevelopment.	Rule 79(2)(c)(ii)	1.0	0.38	• IT component of Jandakot development moved to overall Jandakot budget
Pressure monitoring data visualisation	Pressure monitoring data visualisation: proje ct to facilitate dynamic monitoring of pressure across the network for strategic asset management	Rule 79(2)(c)(i)(ii)	-	1.1	• Project reclassified as IT in AA3. Forecast expenditure to June 2014 is $0.1M lower than in ERA approved AA3 forecast due to the project phasing being slightly slower than anticipated.
Telemetry replacement	Replacement of flow computers, transducers, data loggers and communications equipment which have reached end of life.	Rule 79(2)(c)(i)(ii)	-	1.0	• Project reclassified as IT in AA3. Forecast expenditure to June 2014 is $0.3M higher than in ERA approved AA3 forecast due to the project phasing being slightly ahead of target due to telemetry units having reached end of life.
Field Mobility Phase 2	Additional Functionality and extending solution to sub-contractors as per Deloittes' recommendations	Rule 79(2)(c)(i)(ii)	1.8	-	• Phase 2 of Field Mobility has been rephrased to AA4.
Total IT capital projects identified during the AA3 revision process.			**17.8**	**16.97**	
Access Arrangement	Benchmarking exercise for Access Arrangement			0.02	Engagement of external consultants to assist with Benchmarking exercise of

Project name	Project Description	Regulatory Justification	AA3 approved real 2014 $million	AA3 actuals real 2014 $million	Comments
	submission				ATCO Gas Australia's IT services.
Inspections Register	Replacement project to address operational risk and support redundancy.			0.02	Solution replaced manual Excel spread sheet that had become difficult to support and maintain for a critical business function.
ATCO Gas Australia Website Development	Redevelop ATCO Gas Australia external website.			0.02	Modifications required to the external website to bring in-line with ATCO Gas Australia's corporate branding.
Employee Self Service	Solution implemented to allow ATCO Gas Australia employees to book leave online.			0.06	Streamlined the HR leave process significantly without and eliminated the paper-based trail.
Corporate Mobile Data Management (MDM) Solution	Implement a solution for ATCO Gas Australia's smartphone and I-Pad telephony equipment.			0.01	Solution required catering for smartphone and mobile technology.
Online Capital Expenditure Request (CER) Form	Solution to streamline and centralise the approval of Capital Expenditure requests and approvals for ATCO Gas Australia Finance.			0.02	Manual, inefficient paper-based solution replaced.
Legal Contact Form	Solution to streamline and centralise ATCO Gas Australia Legal requests and approvals.			0.04	Manual, inefficient paper-based solution was replaced.
Project Management	Project Management Fee under WAGN.			0.3	Project Management fee
Total IT Capital Projects not identified during the AA3 revision process				**0.49**	
Total IT PPE not identified during the AA3 revision process				**0.78**	IT hardware and software capital items including desktop and associated IT related peripherals. IT related equipment not originally categorised as an ATCO Gas Australia asset. Classification changed during the WNG divestment of assets and sales process
Total IT Projects			**17.8**	**18.2**	

7.8 WestNet

The value of WestNet Energy assets forecast to be purchased by WAGN was $4.6 million. The purchase of Westnet Energy by WAGN was completed on 31 July 2010 including the transfer of Westnet Energy assets into the WAGN asset base.

Prior to August 2010, WestNet Energy Services provided services to WAGN. When the service agreement ended, the employees were transferred to WAGN and the assets were acquired. In the AA3 Final Decision, the ERA considered that the acquisition of assets from WestNet met the criteria for conforming capital expenditure set out in rule 79(2) of the NGR. The ERA included an estimate for the acquisition in the forecast conforming capital expenditure. The actual acquisition costs were less than the estimate. Table 52 presents the ERA estimate (inflated to 2014 dollars) and the actual acquisition costs.

Table 52: WestNet conforming capital expenditure: ERA approved forecast, actual and estimate for AA3

$ million real at 30 June 2014	ERA approved forecast	Estimated actual
WestNet Energy Services	4.6	3.3

The value of WestNet Energy Services assets acquired was less than forecast primarily due to the deferral of vehicle purchases to a date after the WestNet Energy Services assets were acquired by WAGN. Since the acquisition of WAGN by ATCO Gas Australia, that deferred expenditure and additional expenditure has been incurred on vehicles as demonstrated in the plant and equipment expenditure section.

7.9 Capital contributions

ATCO Gas Australia received $12.0 million in capital contributions during the period 1 January 2010 to 30 June 2014. This amount has been subtracted from past conforming capital expenditure for the purpose of determining the opening capital base.

Capital contributions are generally of two types;

1. Contributions by third parties, (i.e. non retailer) to large projects such as new developments, hospitals or bus stations
2. Contribution to non-standard delivery facilities such as where a mains extension is required or there are non-standard site conditions

Capital contributions are very difficult to forecast as they occur as a result of customer requests. The likelihood of capital contribution is dependent on customers' requirements in relation to the type, size and timing. During AA3, the capital contributions varied significantly compared to forecast. The major variation related to the Fiona Stanley and QEII hospital projects in 2010/11 and 2011/12.

Table 53 below presents the capital contributions for the AA3 period.

Table 53: User capital contributions: ERA approved forecast and AA3 actual

$ million real at 30 June 2014	Jan to June 2010	2010/11	2011/12	2012/13	2013/14
Capital Contributions	0.1	1.9	5.3	0.7	-
Service Connection Charges	0.2	0.8	0.9	0.9	1.2
Total	**0.3**	**2.7**	**6.2**	**1.6**	**1.2**

Contributions often relate to customer specific mains extensions and additional work relating to multi-unit developments or commercial connections.

In 2012, ATCO Gas Australia commenced a new approach to capital contributions so that capital contributions are only required where the incremental costs of the work required does not cover the incremental revenue to be received from the customers. This is expected to reduce the capital contributions to be received in the future.

8. Capital expenditure

8.1 Key messages

- ATCO Gas Australia will invest $605.7 million of capital over the AA4 period
- The investment is required to:
  - Comply with the requirements of the Safety Case[103], as accepted by Energy*Safety*
  - Maintain system integrity as customers numbers and gas throughput increases
  - Support economic infill and expansion of the Network
  - Support the growing requirements of the Network and deliver on customer expectations in relation to information and service support
- The forecast method adopted for each category of expenditure considers past experience, new information and implications for expectations about the future.
- The forecast expenditure reflects efficient work practices, activities, procurement and delivery strategies

8.2 National Gas Rules requirements

Forecast capital expenditure must be such as would be *incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services*[104]. Capital expenditure must also be justified on the following grounds:

a) the overall economic value of the expenditure is positive; or

b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or

c) the capital expenditure is necessary:

(i) to maintain and improve the safety of services; or

(ii) to maintain the integrity of services; or

(iii) to comply with a regulatory obligation or requirement; or

(iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

[103] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011

[104] Rule 79(1)(a), *National Gas Rules (Version 19)*, 14 January 2014.

> d) *the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).* [105]

In deciding whether the overall economic value of capital expenditure is positive, consideration is to be given only to economic value directly accruing to the service provider, gas producers, users and end users.[106]

In determining the present value of expected incremental revenue:

> a) *a tariff will be assumed for incremental services based on (or extrapolated from) prevailing reference tariffs or an estimate of the reference tariffs that would have been set for comparable services if those services had been reference services; and*
>
> b) *incremental revenue will be taken to be the gross revenue to be derived from the incremental services less incremental operating expenditure for the incremental services; and*
>
> c) *a discount rate is to be used equal to the rate of return implicit in the reference tariff.*[107]

8.2.1 Assessment against the NGR

ATCO Gas Australia has assessed its capital expenditure forecasts against the NGR requirements. Network capital expenditure is categorised into the following categories:

- **Network sustaining expenditure**
- **Network growth expenditure**
- **Structures and equipment expenditure**
- **IT expenditure**

These expenditure categories directly reflect the requirements of the Safety Case and the objectives, plans and standards encompassed in ATCO Gas Australia's Asset Management Plan (AMP)[108].

The capital expenditure captured in network sustaining category is necessary to maintain and improve the safety of services, maintain the integrity of services, comply with regulatory obligations and to maintain and secure ATCO Gas Australia's capacity to meet current levels of demand for services.

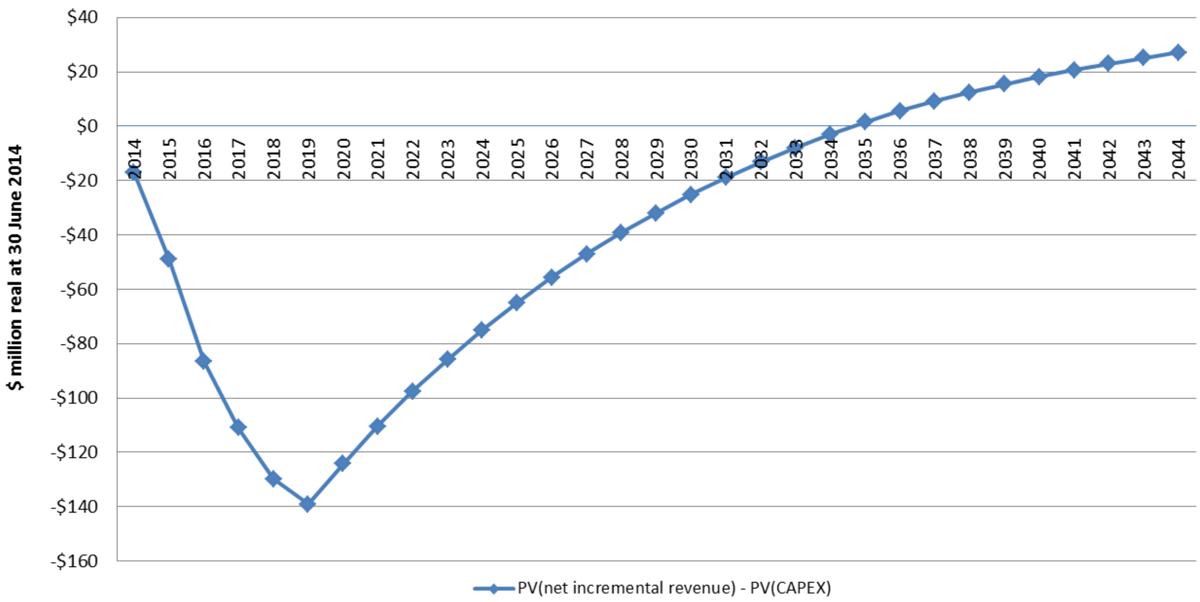
Network growth expenditure is necessary to comply with regulatory obligations and maintain integrity of services in line with forecast growth in demand. Network growth capital expenditure includes investment critical to achieving economic growth of connections. Extending the Network in a timely manner will facilitate the efficient connection of

[105] Rule 79(2), *National Gas Rules (Version 19*), 14 January 2014.
[106] Rule 79(3), *National Gas Rules (Version 19*), 14 January 2014.
[107] Rule 79(4), *National Gas Rules (Version 19*), 14 January 2014.
[108] Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014.

customers resulting from new residential or commercial developments. Revenue from the new connections decreases charges for all customers over time.

Network growth capital expenditure is supported by the forecast incremental revenue expected from new connections over the longer term. ATCO Gas Australia has conducted net present value analysis for network growth capital expenditure. Based on the number of new connections over the AA4 period and the assumed consumption per connection, the NPV of the investment over the expected 30 year life of forecast connections (including mains required to facilitate these connections) is $27.0 million. The chart below illustrates the profile of net present value of expected life of forecast connections.

Figure 65: NPV of incremental revenue from growth capital investment in AA4



Structures and equipment expenditure is required to ensure a safe and reliable service to customers. ATCO Gas Australia's expenditure forecasts are based on meeting regulatory and operational requirements to own and operate depots, fleet and supporting equipment that is fit for purpose, and to ensure that it meets Safety Case obligations. This is to ensure that ATCO Gas Australia is able to provide a timely and effective response to network events to meet the requirements of a growing network footprint and customer numbers over the long term. The lowest sustainable cost is achieved through a prudent long term ownership strategy, which aligns to good industry practice to deliver value to customers and flexibility for ATCO Gas Australia to adapt to changing customer and operational demands.

IT expenditure is required to manage and operate the Network to maintain the integrity of services and to capture and manage information to comply with regulatory obligations and requirements. IT expenditure ensures the existing IT infrastructure, Disaster Recovery (DR), applications and support of the IT environment is capable of delivering an IT service to the ATCO Gas Australia's business functions that promote and support safety, reliability and cost effectiveness. The criticality of replacing end-of-life IT infrastructure is core to ensuring ongoing IT system security and reliability.

In accordance with the ATCO Gas Australia Procurement Policy, the cost of services provided to ATCO Gas Australia are market tested and benchmarked to ensure market and peer group comparable rates are achieved to deliver business objectives.

8.3 Efficiency assessment of capital expenditure

8.3.1 Investment planning and governance

ATCO Gas Australia's forecast capital expenditure is developed from its business planning process, which incorporates asset management strategies and standards, urban and regional development plans and projections, regulatory and technical obligations and safety risk assessments. The overarching objectives for ATCO Gas Australia are to provide safe, reliable, cost competitive, sustainable and customer friendly natural gas delivery service. To meet those objectives ATCO Gas Australia has developed an AMP, which is supported by individual asset class plans. These plans employ a formalised risk based approach designed to ensure Network risks are reduced to as low as reasonably practicable[109].

This risk based approach is the foundation of the Safety Case[110]. The Safety Case is a requirement of the G*as Standards (Gas Supply and System Safety) Regulations 2000*. The Safety Case defines ATCO Gas Australia's approach to all network operations matters and is designed to ensure the safety of employees, end users and the public. The Safety Case also documents the Network and operational risks, controls, procedures and practices. The Safety Case is regularly updated and complies with the requirements of AS 2885 and AS/NZS 4645. It is accepted and routinely audited by Energy*Safety.*[111]

The rigour of ATCO Gas Australia's planning process and cost estimation ensures forecast expenditure represents the lowest sustainable cost of providing services. Cost estimates are based on:

- Realised costs per unit by activity
- Standard rates for materials and labour reflecting actual experience
- Observed changes in market conditions
- Cost estimates provided by suppliers or contractors

Required investment activities are based on:

- Historical levels of activities
- Load planning
- New connections and loads
- Experience and results from inspections
- Safety Case requirements

Technical and operational assumptions underpinning these activities are documented in the AMP. A business case is developed for each project or programme of activities, forecast to cost more than $100,000, to confirm assumptions, requirements and costing prior to work commencing. The business case outlines the specific need for the project, alternatives examined, risks identified and risk mitigation strategies. It also assesses whether the expenditure is prudent and efficient and complies with the NGR.

[109] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.
[110] Appendix 01: WAGN Gas Distribution System Safety Case, WAGN, July 2011.
[111] *Gas Standards (Gas Supply and System Safety) Regulations 2000.*

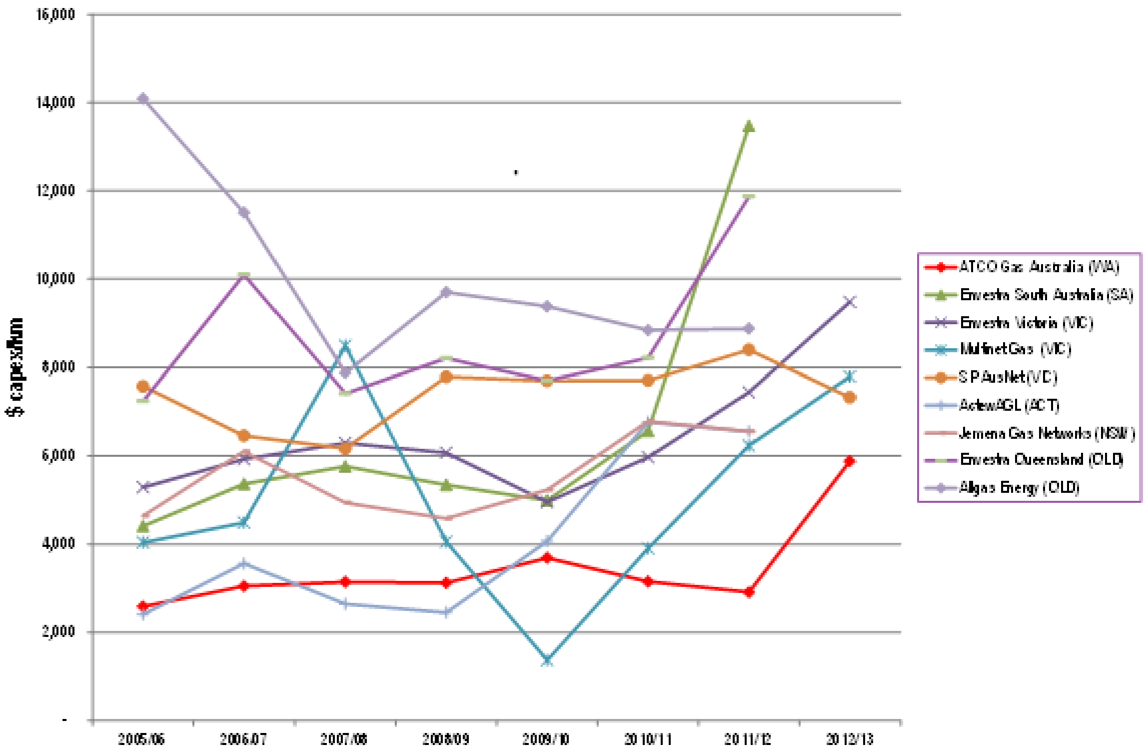
Competitive tendering for the procurement and delivery of materials and work packages is undertaken as part of the work scheduling process. Delivery methods and materials are also reviewed as part of this process to ensure efficient allocation of resources and lowest sustainable cost of provision of the work.

8.3.2 Benchmarking

ATCO Gas Australia has compared its historical and forecast expenditure against other Australian gas distribution network operators. Benchmarking analysis conducted by Economic Insights[112] for Envestra Victoria, Mulitnet and SP Ausnet in 2012 shows that for the period until 2010, in relation to capital expenditure per customer and capital expenditure per kilometre, ATCO Gas Australia had the second lowest costs of twelve businesses compared across Australia and New Zealand.

ATCO Gas Australia commissioned ACIL Allen to undertake a similar benchmarking analysis with updated information in early 2014[113]. This analysis showed that compared to other utilities, ATCO Gas Australia has among the lowest capital expenditure per kilometre and capital expenditure per customer. Figures 66 and 67 below depict a summary of the analysis described above.

Figure 66: Capital expenditure per kilometre: ACIL Allen Gas Distribution Benchmarking (Figure 8)[114]



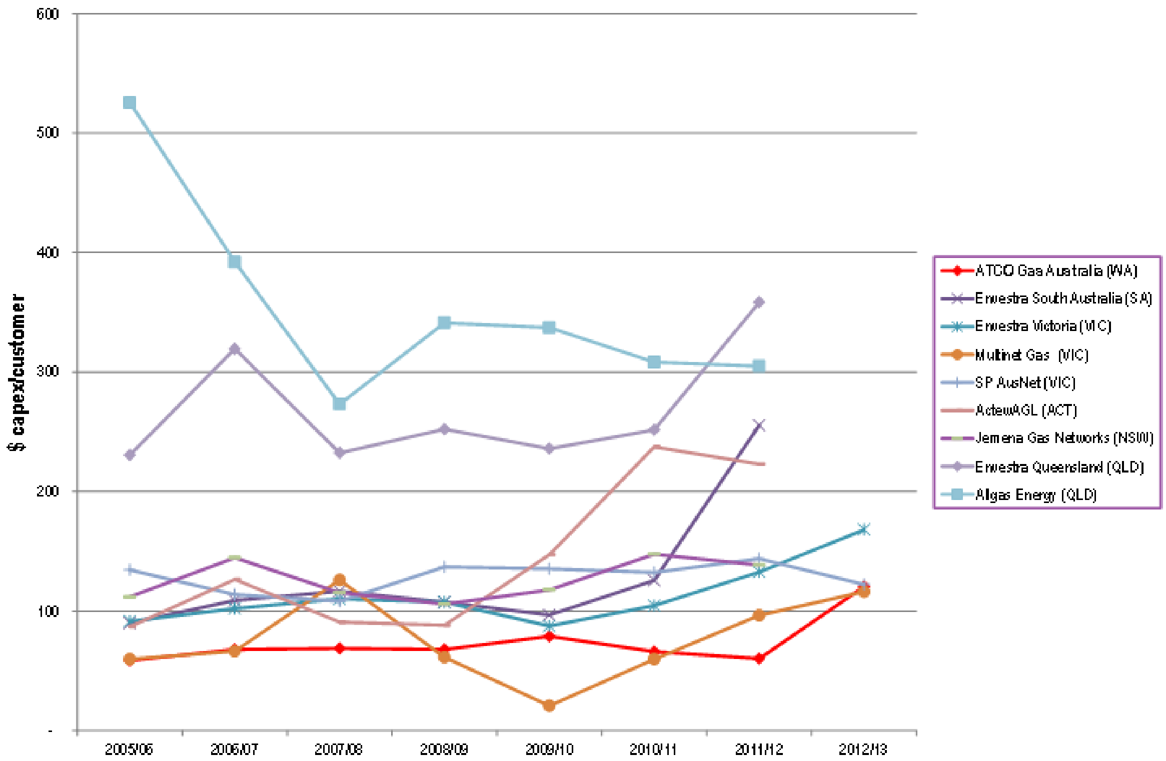
Note: Capex in $Dec 2013

112 Appendix 08: Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators, Economic insights Pty Ltd, March 2012.

113 Appendix 9: Gas Distribution Benchmarking, ACIL Allen Consulting, March 2014.

114 Appendix 9: Gas Distribution Benchmarking, ACIL Allen Consulting, March 2014, Figure 8, p.19.

Figure 67: Capital expenditure per customer: ACIL Allen Gas Distribution Benchmarking (Figure 9)[115]



Note: Capex in $Dec 2013

These indicators also show the increase in 2012/13 compared to prior periods which is forecast to increase through AA4. This reflects the increased investment required to deliver safe and reliable service and to sustainably grow the provision of services – these drivers for investment are most likely to impact on the costs per kilometre. Therefore, although past expenditure has been comparatively low based on partial productivity indicators, these levels are unsustainable into the future. The reasons for the necessary increases in capital expenditure are discussed further in this chapter.

8.4 Overview of the investment proposal

Forecast capital expenditure during the AA4 period is required to:

- Meet the requirements of the Safety Case
- Facilitate new connections as a result of customer-initiated activity
- Extend and expand the Network to maximise the benefits from new residential and commercial developments while maintaining system integrity and security of supply
- Support business growth by investing in IT, depots, fleet, plant and equipment

The total capital expenditure proposed is $605.7 million. This is comprised of:

- **Network sustaining expenditure** which includes network performance and safety and asset replacement ($311.3 million)

[115] Appendix 9: Gas Distribution Benchmarking, ACIL Allen Consulting, March 2014 Figure 9, p.20.

- **Network growth expenditure** which includes customer initiated expenditure and demand related expenditure ($228.5 million)

- **Structures and equipment expenditure** which includes operational depots, fleet, plant and equipment ($38.4 million)

- **IT expenditure** to support network and business operations ($27.4 million)

The table below shows the forecast capital expenditure by category for the AA4 period

Table 54: Forecast capital expenditure by category AA4 period by calendar year (CY)

$ million real at 30 June 2014	July to Dec. 2014	2015	2016	2017	2018	2019	Total
Asset replacement	15.2	33.0	29.1	29.9	35.4	35.1	177.7
Asset performance and safety	2.5	9.0	22.4	34.3	27.9	37.5	133.6
Network sustaining	**17.7**	**42.0**	**51.5**	**64.1**	**63.3**	**72.6**	**311.3**
Customer initiated	15.7	28.7	27.8	27.7	28.2	28.2	156.3
Demand related	3.0	10.5	24.0	14.9	13.3	6.5	72.2
Network growth	**18.7**	**39.2**	**51.8**	**42.6**	**41.5**	**34.7**	**228.5**
Structures and equipment	**3.7**	**16.7**	**3.5**	**3.5**	**5.6**	**5.5**	**38.4**
IT	**2.4**	**5.8**	**5.3**	**4.5**	**5.1**	**4.5**	**27.4**
Total	**42.5**	**103.7**	**112.1**	**114.8**	**115.4**	**117.3**	**605.7**

The forecast expenditure is 124% greater than the AA3 period. This increase is primarily driven by:

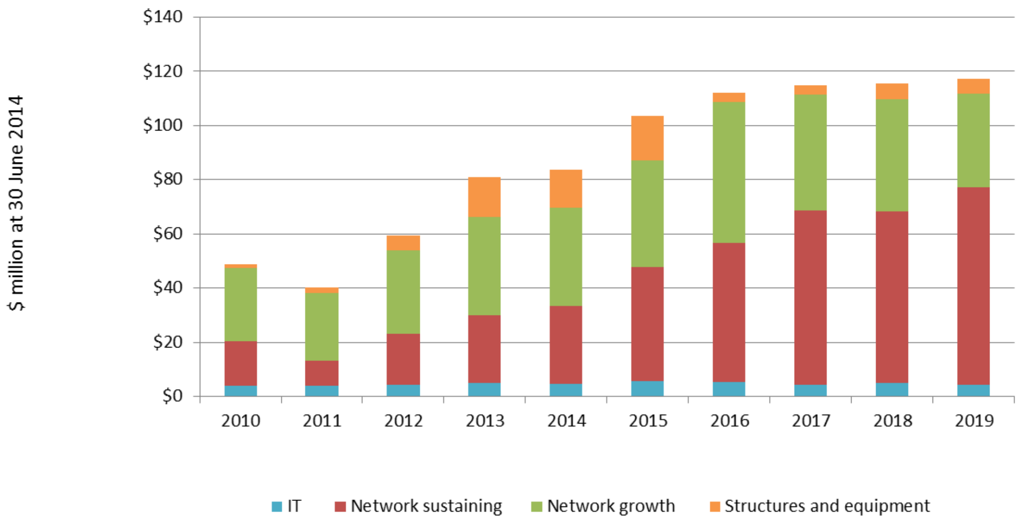
- Work required on the Network as a result of safety assessments conducted as part of complying with the Safety Case, which was accepted by Energy*Safety* and implemented in 2013

- Supporting higher levels of growth investment as a result of initiatives and activities to encourage new connections

- Replacement of legacy and end of life IT systems

The figure below presents the historical and forecast capital expenditure programme.

Figure 68: Total capital expenditure: 2010 to 2019 actual and forecast



The following table presents the forecast expenditure by asset class (as required under Rule 79 (1) of the NGR).

Table 55: Forecast capital expenditure by asset class: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
High pressure mains - steel	2.6	16.9	37.7	36.8	30.4	29.5	153.9
High pressure mains - PE	0.2	0.5	-	1.2	4.2	6.8	12.9
Medium/low pressure mains	14.2	27.0	27.6	26.5	28.6	28.9	152.7
Regulators	1.8	2.8	1.5	1.5	1.5	2.0	11.1
Secondary gate stations	-	-	3.9	7.6	3.4	4.1	19.0
Buildings	1.0	9.4	0.6	0.4	-	-	11.5
Meter and services pipes	17.0	33.1	31.5	32.3	35.7	35.7	185.2
Plant and Equipment	0.6	1.2	1.5	1.3	1.0	1.0	6.7
Fleet	2.1	1.2	0.8	1.4	4.6	4.4	14.5
IT (including Telemetry)	3.0	6.6	6.4	5.5	6.1	4.8	32.5
Land	-	4.9	0.6	0.4	-	-	5.8
Total	**42.5**	**103.7**	**112.1**	**114.8**	**115.4**	**117.3**	**605.7**

The following sections provide an overview of the methodology used to forecast the activities, a description of each category and the corresponding forecast costs for the AA4 period.

8.5 Forecast Network capital expenditure

Network capital expenditure is categorised into **network sustaining** and **network growth** expenditure. Network sustaining capital expenditure is necessary to maintain and improve the safety of services, maintain the integrity of services, comply with regulatory obligations and to maintain and secure ATCO Gas Australia's capacity to meet current levels of demand for services.

Network growth expenditure is necessary to comply with regulatory obligations and maintain integrity of services in line with forecast growth in demand. Network growth capital expenditure is supported by the forecast incremental revenue expected from new connections over the longer term. ATCO Gas Australia has conducted NPV analysis of incremental revenue net of network growth capital expenditure. Based on the number of new connections over the AA4 period and the assumed consumption per connection, the NPV of the investment over the expected 30 year life of forecast connections (including mains required to facilitate these connections) is $27.3 million.

Table 56 shows forecast network capital expenditure for the AA4 period.

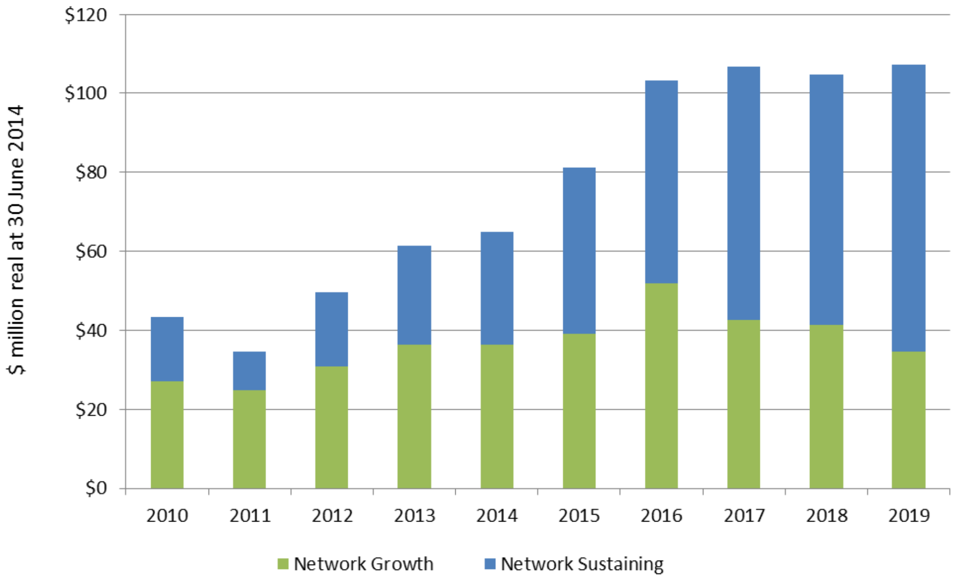
Table 56: Forecast network capital expenditure: 2014 to 2019

$ million real at 30 June 2014	July to Dec. 2014	2015	2016	2017	2018	2019	Total
Network sustaining	17.7	42.0	51.5	64.1	63.3	72.6	311.3
Network growth	18.7	39.2	51.8	42.6	41.5	34.7	228.5
Total Network	**36.4**	**81.2**	**103.3**	**106.8**	**104.8**	**107.3**	**539.8**

Network sustaining expenditure incorporates the majority of the costs associated with implementing the Safety Case requirements, which will increase during AA4. Network growth expenditure increases over the AA4 period compared to previous periods. This is in line with ATCO Gas Australia's proactive approach to facilitate new customer connections and maximise connections from residential and commercial urban development.

Figure 69 shows the change in these cost categories over time.

Figure 69: Network capital expenditure 2010 to 2019



8.5.1 Network sustaining capital expenditure

ATCO Gas Australia has worked closely with Energy*Safety* to ensure that new information and experience is incorporated into planning activities in order to achieve the required safety outcomes. A review of the Safety Case is being undertaken in 2014 and may impact on the proposed capital expenditure program.

ATCO Gas Australia forecasts $311.3 million in capital expenditure for the AA4 period to replace assets and ensure Network performance and safety. Network sustaining capital expenditure includes a number of programmes continuing from the previous access arrangement as well as new programmes.

ATCO Gas Australia integrates risk management into day-to-day decision making. ATCO Gas Australia has adopted the International Standard for Risk Management ISO 31000:2009 as a benchmark to establish, implement and maintain its risk management framework. A 'top-down' and 'bottom-up' view is taken towards the implementation of the risk management framework and involves assessing risks from different stakeholder perspectives and risk types.

As part of the Safety Case and AMP, ATCO Gas Australia conducted formal safety assessments (FSAs) for all asset classes. FSAs inform the development of asset class plans, which identify asset lifecycle strategies. Through this process, ATCO Gas Australia has identified the following actions required to reduce network risk to as low as reasonably practicable:

- Remove all unprotected metallic mains from the network
- Upgrade or replace distribution infrastructure within multistorey buildings
- Upgrade high pressure pipelines to facilitate in-line inspections
- Install high pressure pipelines, interconnections and associated pressure reduction infrastructure to provide supply security for customers

ATCO Gas Australia has liaised with Energy*Safety* as part of its Safety Case review and the Safety Case has been accepted by Energy*Safety*. The Safety Case is to be reviewed during 2014, to ensure that new information and experience is incorporated into the planned activities to achieve the required safety risk outcomes. This may impact on the capital expenditure program.

ATCO Gas Australia categorises network sustaining capital expenditures into two subcategories:

- Asset replacement
- Asset performance and safety

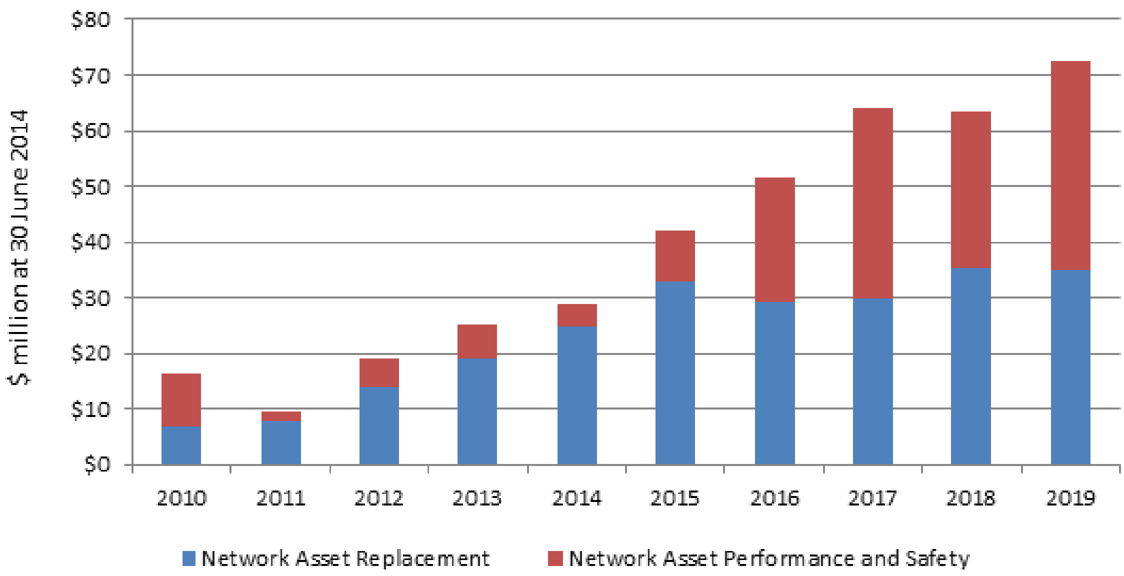
The table below shows forecast network sustaining capital expenditure for AA4.

Table 57: Forecast network sustaining capital expenditure: 2014 to 2019

$ million real at 30 June 2014	July to Dec. 2014	2015	2016	2017	2018	2019	Total
Asset replacement	15.2	33.0	29.1	29.9	35.4	35.1	177.7
Asset performance and safety	2.5	9.0	22.4	34.3	27.9	37.5	133.6
Total network sustaining	**17.7**	**42.0**	**51.5**	**64.1**	**63.3**	**72.6**	**311.3**

Network sustaining capital expenditure will increase in AA4 compared to previous years in order to deliver the requirements of the Safety Case to reduce the risks associated with various asset classes to as low as reasonably practicable. The chart below presents the proportion of expenditure forecast for asset replacement compared to network performance and safety over time.

Figure 70: Sustaining capital expenditure: 2010 to 2019



The increase in asset replacement capital expenditure consists of step increases to current recurring asset replacement programmes and the introduction of new recurring programmes to replace network assets that are at the end of their safe operating life. Examples of replacement capital expenditures are:

- Replacing metallic mains that are either non anti-corrosion coated or not protected by cathodic protection systems
- Replacing distribution assets within multistorey buildings
- Replacing natural gas meters under applicable *Gas Standards (Gas Supply and System Safety) Regulations 2000*

This is discussed in more detail in sub-section (a) below.

The increase in network performance and safety capital expenditure consists of step increases to current recurring asset replacement programmes and the introduction of new recurring programmes and one-off projects required to upgrade and improve network assets or operations to meet safety, reliability or efficiency requirements. Examples of Network Performance and Safety capital expenditures are:

- Installation of high pressure pipelines, interconnections and associated pressure reduction infrastructure to provide supply security and reliability to the Network
- Upgrading high pressure Network assets to accommodate inline inspections

This is explained in more detail in section (b) below.

(a) Asset replacement

ATCO Gas Australia forecasts $177.7 million of investment in asset replacement over the AA4 period. This comprises:

- Unprotected metallic mains replacement
- Asset replacement due to condition assessment and location
- Asset replacement as a result of scheduled life cycle replacement

Table 58 shows cost of these replacement programmes. The programmes are discussed below.

Table 58: Forecast asset replacement expenditure by programme: 2014 to 2019

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Unprotected metallic mains replacement	8.0	14.1	14.5	14.5	17.0	17.0	**85.1**
Condition based asset replacement	3.8	5.9	4.9	5.0	5.1	5.1	**29.7**
Other asset life cycle replacement	3.3	13.0	9.6	10.4	13.3	13.1	**62.8**
Total asset replacement capital expenditure	**15.2**	**33.0**	**29.1**	**29.9**	**35.4**	**35.1**	**177.7**

Unprotected metallic mains replacement

This involves replacing unprotected steel mains, cast iron and galvanized iron mains and associated services with a fully fused polyethylene solution. The programme will include:

- **Metallic mains –** Replacing 133 km of unprotected steel and galvanized iron mains plus associated services ($50.6 million)
- **Odd size steel** - Replacing 33 km of odd size unprotected steel mains, galvanized iron mains and associated services ($10.1 million)
- **Cast iron** - Replacing 58 km of cast iron mains, embedded unprotected steel mains plus galvanized iron and associated services in Fremantle ($22.5 million)

ATCO Gas Australia will conduct this work through a proactive replacement programme for pipelines which are assessed as higher risk due to the asset age, construction and maintenance history, condition and location in populated areas. The replacement programme will provide ATCO Gas Australia with the capability to replace and upgrade older system components on a prioritised and planned basis. It will enhance system safety, as well as reduce emissions from leak-prone systems.

The advantages of the proactive replacement programme are:

- Alignment and compliance with the requirements of Safety Case including the reduction of risks associated with these assets to as low as reasonably practicable
- The replacement of ageing and more leak-prone infrastructure in a more comprehensive and timely manner
- Cost savings resulting from increased scale through comprehensive planning, geographically-focused replacement efforts and the efficient use of resources
- Less disruption and improved coordination with affected local authorities, government agencies and other utility operators by moving from a reactive to a planned and phased replacement programme
- Efficient deployment of capital for safety and reliability through a reduction in emergency repair efforts otherwise required
- Prioritisation of leak reduction and associated risks on a planned basis rather than a more reactive piecemeal approach
- Reduced methane emissions from leak-prone system components
- Increased system integrity
- Safety and reliability measures can be achieved in an appropriate timeframe

Metallic mains included in this replacement programme are either non anti-corrosion coated or not protected by cathodic protection systems, and were installed between 1915 and the 1960s. The mean annual leak rate for unprotected steel mains is more than ten times the average leak rate for the remainder of the Network. The current risk associated with these assets is not as low as reasonably practicable due to the risk of loss of containment and leak tracking into a building. The replacement programme will remove all unprotected metallic mains from the network by the end of the AA4 period.

Steel pipes included in this replacement programme range in diameter from 20 mm to 635 mm. Due to age, the coating on many of these pipes is disintegrating and ineffective, which is leading to cases of aggressive crevice corrosion and pitting resulting in perforated leaks. Photographic evidence of this is included in the AMP. Unless replaced these pipes will continue to deteriorate, increasing the likelihood of leaks and associated reactive maintenance.

Galvanised iron pipes are coated with zinc to protect from corrosion. However, these pipes were commonly manufactured with screwed ends and their joints have gradually deteriorated, resulting in increased risk of leaks and reactive maintenance. Photographic evidence of this is included in the AMP.

Before the introduction of natural gas, most of these ageing mains were used to transport manufactured gas to the Perth metropolitan area. Manufactured gas had high water content, which resulted in internal corrosion and residue collecting along the mains, causing partial or full blockages. The full extent of blockages on these mains is not known but does increase the risk of supply interruption to customers. Blockages can also inhibit control of gas flow the event of a network emergency.

Odd size unprotected steel mains

The Network contains odd size unprotected steel mains that require replacement. These mains have been prioritised for replacement due to the inability to isolate a localised section with standard flow stopping equipment, particularly in the case of emergency repairs.

Generally, odd size steel was installed in the 1960s and 1970s as trunk mains to support a wide distribution area. Without the ability to use standard flow stopping equipment, isolating these mains disrupts the continuity of gas supply to a far greater number of customers than would otherwise be necessary. These customers are affected by all network activities on these mains that require isolation, such as altering alignment, sectional replacement and emergency repairs.

The majority of the odd size steel trunk mains were also constructed without cathodic protection as they were manufactured with coal tar enamel coating. Due to their age, the coating on many of these pipes is disintegrating and ineffective, leading to aggressive crevice corrosion and pitting. Photographic evidence of this is included in the AMP. The replacement programme will remove all odd size unprotected metallic mains from the network by the end of the AA4 period.

Cast iron mains

The Fremantle area of the Network contains cast iron mains with embedded unprotected steel. Gas mains in Fremantle date back to the late 19th century when the mains were used to supply manufactured town gas. In the early 1990s operating pressure was raised from 1.5 kilopascals (kPa) to 5kPa in order to meet growing demand. Network modelling on the current network indicates that even with the elevated pressure, network pressure drops below the allowable minimum pressure in a normal winter. Increased operating pressure has resulted in a greater number of leaks, leading to reactive maintenance costs and UAFG. Low pressure leaks do not disperse easily and tend to accumulate close to the ground, increasing the risk of gas tracking into buildings.

ATCO Gas Australia has implemented a proactive replacement programme to improve security of supply and to improve the safety and integrity of the cast iron gas mains and services. This programme will replace approximately 7 kilometres of cast iron and 5 kilometres of embedded unprotected steel mains each year, with completion forecast in AA4. The replacement programme includes installation of medium pressure regulators at each meter so the area can be upgraded to medium pressure. This is a long term solution that ensures network integrity, continuity of supply to customers and capacity to accommodate increasing demand.

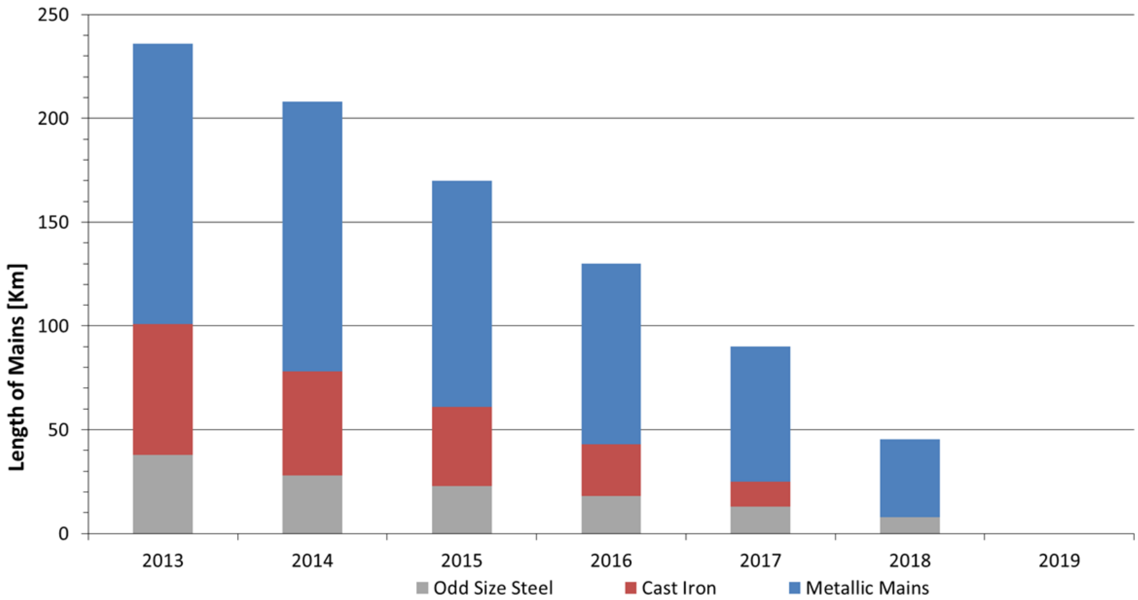
Table 59 provides the length of mains to be replaced in each year over the period under this programme.

Table 59: Lengths of Mains for Metallic Mains Replacement Programme: 2014 to 2019 (km)

Replacement programme	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Odd size steel	5	5	5	5	5	8	**33**
Unprotected metallic mains	5	21	22	22	28	38	**133**
Cast iron	8	12	13	13	12	-	**58**
TOTAL [km]	**16**	**38**	**40**	**40**	**45**	**46**	**225**

Figure 71 shows the reduction in unprotected metallic mains over the AA4 period.

Figure 71 - Quantity of remaining metallic mains each year end: 2013 to 2019 (kilometre)



Asset condition and location based asset replacement

ATCO Gas Australia has identified assets requiring replacement during the AA4 period based on location and condition assessment. These assets include:

- **Multi-storey buildings**: replace above ground and underground ATCO Gas Australia infrastructure supplying approximately 3,900 meter locations in multistorey buildings ($20.0 million)

- **Meters with plugs replacement**: replace 45,000 meters that have faulty plugs ($9.7 million)

Multi-storey buildings

The connection policy adopted for multi-storey buildings by ATCO Gas Australia's predecessors removed boundary master meters and converted sub-meters to billing meters, thereby incorporating downstream installations into the distribution network. This policy is no longer practiced. The condition of this ageing infrastructure is not known, however a FSA conducted as part of the Safety Case identified the risk of gas escapes associated with this infrastructure as not being as low as reasonably practicable.

ATCO Gas Australia engaged with Energy*Safety* to develop a solution which would reduce the risks associated with these assets and the service to end use customers. A risk-based approach has been used to prioritise the upgrade of infrastructure throughout all multi-storey buildings currently identified. The programme, which is forecast to be completed by the end of AA4, is divided into three areas of focus as follows:

- ATCO Gas Australia infrastructure within multistorey buildings greater than or equal to 3 storeys
- ATCO Gas Australia infrastructure within multistorey buildings of 2 storeys.
- ATCO Gas Australia ground level metering infrastructure within buildings

Faulty plugs

This project involves replacing a population of M6WA domestic gas meters that have faulty plugs. These meters were installed in the gas distribution network between December 1994 and June 1998. A total of 65,830 remain in service. A plastic plug was designed to provide access to the tangent for adjusting the accuracy of the meter when meters were refurbished. This practice is no longer conducted.

In summer during low or no flow conditions, these meters can be subject to high ambient temperatures causing the trapped gas pressure in the meter to increase. This can cause the plug to leak, resulting in uncontrollable loss of containment at a dwelling. Fault analysis on leaking meters indicated a rising trend of leaking plugs from 16 years onwards. The condition of these plastic plugs is expected to deteriorate further over time, increasing the likelihood of leaks. Replacing these meters will eliminate the risk.

A risk based replacement programme has been established which prioritises the replacement of oldest meters with plugs located within multi storey buildings followed by meters located in single dwellings. Replacing these meters will improve the reliability of supply to the customer, as well as ensuring the continued safety of employees, contractors and the public.

Other asset life cycle replacement

Over the AA4 period there are a number of assets that will require replacement as a result of the planned asset replacement programme. The AMP prescribes where assets are due for replacement due to the cost of continuing to maintain the asset and/or the service performance or risk associated with the asset. The key projects for assets to be replaced during the AA4 period are referred below with further smaller projects outlined in the AMP.:

- **PVC mains replacement**: 17 km of mains in high density community use areas within older suburbs showing highest fault rates plus galvanised iron and PVC services ($12 million)
- **Routine meter replacement**: 147,000 meters will be replaced under the routine domestic meter change programme to comply with Gas Standards (Gas Supply and System Safety) Regulations 2000 ($31.6 million)
- **Service replacements**: This programme includes the replacement of approximately 8,800 gas services, which based on a condition assessment have reached end of operational life, with a fully fused copper to Polyethylene (PE) solution.. ($9.3 million)
- **Replace high pressure pipeline HP017**: ATCO Gas Australia has reviewed its high pressure pipeline assets and identified that pipeline HP017, Bibra Lake, is a 2.2km

section of DN200mm steel pipeline with wall thickness of 3.1mm API5L Grade B material. In residential, high density and sensitive location areas where pipeline failure would create potential for high consequence escalation, pipelines must be designed such that rupture is not a credible failure mode. In accordance with AS2885.1:2012 Pipelines- gas and liquid petroleum - Part1 design and construction, the hoop stress shall not exceed 30% of Specified Minimum Yield Stress (SMYS). When typical AGA network 1mm thick third party contact or corrosion damage is allowed for, HP017 does not meet minimum wall thickness requirements for safety and maintenance issues. This thin-wall gas pipeline has less pipe wall penetration resistance against third party damage than other AGA high pressure steel pipelines and presents considerable maintenance challenges with welding not allowed. To reduce the risk of operating this pipeline to ALARP, ATCO Gas Australia proposes to retire this under designed asset and replace it with a new pipeline which fully meets current AS2885 design, construction and operation safety standards. ($3.2 million)

- **Smaller replacement projects (AMP)**: includes the replacement of End of Life Telemetry equipment, medium and high pressure regulators, isolation and service valves and cathodic protection equipment ($6.7 million)

PVC mains replacement

PVC was first introduced into the network in 1963 and became the material of choice for mains and services. In 1993, polyethylene (PE) mains and services were introduced and in 2003 PE became the material of choice consistent with prudent operators nationally and internationally.

The dominant failure modes causing leaks on the PVC network have been identified as:

- Deteriorated rubber O-rings used by mechanical fittings, such as service tees, tapping bands and compression couplings

- Pipe brittleness for some of the older mains making them prone to damage and breakage

Replacing PVC mains and associated services with PE removes these dominant failure modes and provides a fully fused solution, increasing network integrity and safety.

Assessments conducted for the Safety Case recommend that PVC network replacement should be targeted in high density community use areas. Faults in PVC mains contribute to more than 80% of the annual reactive maintenance cost on mains and those mains with a diameter of 100mm or greater forming a large proportion of these costs. ATCO Gas Australia has identified 17 km of PVC pipes greater than 100mm diameter that require replacement during AA4.

Routine meter replacement

The Gas Standards (Gas Supply and System Safety) Regulations 2000 requires a network operator to ensure that every domestic master meter installed after commencement is replaced at intervals not exceeding 18 years, or comply to an alternative requirement approved by the Director of Energy*Safety*.[116]

[116] Gas Standards (Gas Supply and System Safety) Regulations 2000.

In September 2008, Energy*Safety* approved an alternative requirement, extending the in-service life of M6EW meters to 25 years and that the expired meter must be replaced with a new meter.

In July 2009, Energy*Safety* approved the replacement of ME602 meters with a new meter after their 18 years in-service life.

This systematic replacement programme reflects proactive and structured management of routine meter changes. It also provides a more manageable capital works profile to drive the most competitive installation rates. During the routine replacement of a domestic meter, the regulator and all rubber seals and O-rings are replaced, along with components deemed at the end of their operational lives.

The meter change programme has been established to ensure residential and commercial customer meters achieve an accuracy level that complies with the criteria specified in the Gas Standards (Gas Supply and System Safety) Regulations 2000 and meet the requirements of AS4944-2006.

(b) Asset performance and safety

ATCO Gas Australia forecasts $133.6 million of investment on asset performance and safety over the AA4 period. Asset performance and safety expenditure is required to upgrade and improve network assets or operations to meet safety, reliability or cost effectiveness requirements. The table below presents the forecast capital expenditure by programme. Key programmes of work are discussed in the following sections, with further projects discussed in detail in the AMP.

Table 60: Forecast network performance and safety capital expenditure by programme AA4

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Security of supply - Interdependency	-	-	6.6	11.1	10.6	19.0	**47.3**
Security of supply – HP spur lines	-	2.1	8.3	12.6	10.5	10.5	**44.0**
Security of supply – Transmission interconnections	-	-	3.3	7.1	3.4	4.1	**17.9**
Inline inspections of high pressure pipelines	-	2.9	0.9	0.5	0.8	1.7	**6.8**
Transmission gate stations upgrades	-	-	0.6	0.5	-	-	**1.1**
Meters compliance project	0.1	0.9	0.9	0.9	0.9	0.9	**4.6**
Facility upgrades – High pressure regulating equipment	0.4	1.3	1.3	1.1	1.1	0.7	**5.9**
Facility upgrades - OPSO safety devices	1.0	1.1	-	-	-	-	**2.1**
Facility & capacity upgrades - other	1.1	0.7	0.5	0.5	0.6	0.6	**4.0**
Total asset performance and safety expenditure	**2.5**	**9.0**	**22.4**	**34.3**	**27.9**	**37.5**	**133.6**

Security of supply – Interdependency

In order to reduce the risk of loss to greater than 25,000 customers during a Network event on a HP pipeline or existing HPR to as low as reasonably practicable, ten high pressure mains affecting 17 pressure reduction facilities must be constructed.

In accordance with AS/NZS4645.1 the Network must be designed and constructed to ensure security of supply to customers. Using industry standard modelling software, a network study identified critical high pressure regulators (HPRs) where the interruption to such HPRs may result in loss of supply to more than 25,000 customers. Loss of supply to 25,000 customers is considered a catastrophic event in accordance with ATCO Gas Australia's risk matrix (which is consistent with the risk matrix prescribed in AS/NZS 4645).

Ten high pressure mains affecting 17 pressure reduction facilities must be constructed to reduce the risk of loss of gas supply to greater than 25,000 consumers during a network event on a high pressure pipeline or existing HPR to as low as reasonably practicable. Constructing these high pressure mains will facilitate an optimum HPR supply arrangement by positioning the HPRs at appropriate locations to supply gas to lower pressure distribution networks reliably.

This project will mitigate the risks and costs associated with loss of supply such as:

- Air entering the network resulting in a potentially explosive gas and air mix
- Network isolation and de-pressurisation
- Consumer curtailment
- Network purging
- Consumer relights

Security of supply – HP spur lines

New high pressure spur lines and pipelines are primarily demand-related capital expenditure. However, the forecast investment also provides security of supply to new and existing customers. Therefore, a proportion of the infrastructure costs are allocated to network sustaining capital forecasts. These spur lines are discussed in detail in section 8.5.2 (b) below.

Security of supply – Transmission interconnections

Transmission gate station interconnections provide the only gas supply points into the Network. Currently there are currently 14 gate stations supporting approximately 683,000 customers. 13 of these gate stations supply gas from the Dampier to Bunbury Natural Gas Pipeline (DBNGP) while the remaining one supplies gas from APA Group's (APA) Parmelia Pipeline.

During the Varanus Island outage, gas supplies in the DBNGP were restricted by 30%, which lead to curtailment of customers on the Network. Since the outage, APA has commissioned Mondarra storage facility which was further expanded in 2013. In order to safeguard supplies to residential customers against the potential future supply interruption on the DBNGP, it is prudent to establish interconnects to the Parmelia pipeline to enable access to the gas available within the Mondarra storage facility.

ATCO Gas Australia proposes that six additional gate station interconnects to the Parmelia Pipeline are installed within the Perth metropolitan area to ensure security of supply in accordance with the requirements of AS/NZS4645.

Inline inspections of high pressure pipelines

High pressure gas steel pipelines operating above 1050kPa are operated and maintained in accordance with AS2885. All of ATCO Gas Australia’s high pressure steel pipelines currently operate below the maximum allowable hoop stress limit of 30% Specified Minimum Yield Stress (SMYS) in populated areas. Remaining life review assessments must be conducted at maximum ten-year intervals in accordance with AS2885.3:2012 Section 10.3 requirements. Assessments are conducted via in-line-inspections (‘intelligent pigging’) and are regarded as good industry practice for pipeline integrity management and safety. ATCO Gas Australia’s high pressure pipelines and in-line-inspection launcher and receiver facilities must be upgraded to ensure that the pipeline inspection gauge (PIG) can be safely introduced and removed from the pipeline, as well as travel the full length of the pipeline.

An in-line-inspection (ILI) programme will provide a baseline of internal corrosion, unidentified external damage and enable pipeline assessment in areas not previously accessible to surface dig-up inspections (such as water course and major road/ rail crossings). This will measure integrity of all parts of the high pressure gas pipeline network. Pipelines listed for inspection will be prioritised in accordance with their age, operating pressure and risk based on proximity to sensitive areas.

Transmission gate station upgrades

As part of the network modelling process and to ensure the integrity of the Network, ATCO Gas Australia relies on DBNGP’s transmission gate station capacity to validate the outcome of the model. Five gate stations are identified to be under-capacity, or close to under-capacity during a peak or severe winter condition. Harrow Road and Pinjarra gate stations are under-capacity on a peak winter condition while Caversham, Clifton and Russell Road gate stations will be under or close to under-capacity during a severe winter condition.

Gate stations must have the capacity to meet Network demand. An under-capacity gate station will result in pressure drop within the high pressure network. A prolonged period of under-capacity can cause pressure drop to a level where it will not support the high pressure regulators, which support the medium pressure networks. Pressure within the medium and medium-low pressure networks would then deteriorate rapidly unless consumer gas supplies are curtailed. The effectiveness of the curtailment would then determine the survival of the medium and medium-low pressure networks and the extent of the networks being maintained above positive pressure.

To ensure continuity of gas supply and continue safe operation of the Network, ATCO Gas Australia proposes to upgrade the identified gate stations. ATCO Gas Australia will fund the investment to deliver the infrastructure required, with DBNGP continuing to own and operate the gate station. This approach has been applied successfully during AA3 for the Mandurah Gas Lateral Gate Station.

Meters compliance project

There are approximately 8,500 meters located in non-compliant[117] locations such as cavities and cupboards inside commercial and residential properties. Some of these meters are located inside a dwelling within a cluster or multi-storey building.

[117] As per AS/NZS4645 and ASA/NZS 5501.

To reduce the risk associated with uncontrolled gas escape or meter failure to as low as reasonably practicable, ATCO Gas Australia will either relocate the meters or provide appropriate ventilation as required to meet network safety requirements. The solution for each meter will be determined via an inspection process. This programme of work will also eliminate the safety concern associated with gas leaks and inaccessible assets.

Facility upgrades – High pressure regulating equipment

High pressure regulating equipment is critical to the safe and reliable supply of gas throughout the Network. As required by Australian Standards ATCO Gas Australia has performed hazard & operability studies (HAZOPs) on all 15 existing pressure reduction sites that operate above 1900kPa. These sites are required to be monitored for pressure and flow conditions with alarm functionality to ensure network security and reliability.

ATCO Gas Australia has identified 31 high pressure regulating sites where metering and telemetry have not yet been installed. Data from the installation of outlet and inlet pressure monitoring devices at these sites will be used to validate the gas model for severe, peak winter modelling to ensure the timely and efficient expansion of the Network. Upon installation of telemetry, all logged parameters can be alarmed and recorded, including pressures and flow conditions. The 31 sites were chosen based on peak winter flow conditions and potential loss of customers being greater than 500, which is classified as severe risk in ATCO Gas Australia's corporate risk model.

Installation of physical protection is required around above ground high pressure regulating equipment where there is a risk of third party damage through vehicle impact. It is proposed that seven HPR sites are replaced with below ground pits and 19 sites to have bollards installed in order to provide adequate protective measures.

Facility upgrades - OPSP safety devices

AS/NZS 4645 and AS/NZS 2885 require ATCO Gas Australia to install over pressure shut off (OPSO) devices, which protect the downstream gas distribution network from exceeding the maximum allowable operating pressure (MAOP). ATCO Gas Australia will install OPSO on high pressure regulating and metering equipment. This will mitigate the risk of Network damage and/or significant releases of gas that may occur if over pressurisation was to occur.

Facility & capacity upgrades - other

This represents the remaining expenditures required to upgrade and improve network assets or operations to meet safety, reliability or cost effectiveness requirements. Programmes of work include:

- Isolating network sections for ongoing UAFG investigations
- Installing 'high pressure' signage to mitigate the risks of third party asset damage
- Installing 'confined space' signage to improve the safety of workers and the public
- Installing pressure monitoring devices (PMD's) to ensure accurate network performance data
- Installing electrical insulation joints to protect employees and the public
- Step touch mitigation measures by installing equipotential earthing facilities
- Installing electrical surge protection on metallic assets

8.5.2 Growth capital forecast

ATCO Gas Australia forecasts $228.5 million of investment in growth over the AA4 period. Growth capital is categorised into **customer initiated** and **demand related** expenditure to support forecast network growth and approximately 101,000 new connections.

Customer initiated capital expenditure includes extensions to gas mains to pass new and existing customer premises and the construction of service pipes from the mains into those premises. It also includes customer initiated new developments, infill connections and new family/strata units.

Demand related capital expenditure relates to construction of gas infrastructure to ensure that the Network maintains hydraulic capacity to meet the growth in new connections. This category includes infrastructure such as high pressure pipelines and upgrades to pressure regulating facilities to increase capacity and extend the network to areas not currently served by natural gas.

Table 61 shows forecast network growth expenditure.

Table 61: Forecast growth capital expenditure for AA4

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Growth customer initiated	15.7	28.7	27.8	27.7	28.2	28.2	**156.3**
Growth demand related	3.0	10.5	24.0	14.9	13.3	6.5	**72.2**
Total growth capital forecast	**18.7**	**39.2**	**51.8**	**42.6**	**41.5**	**34.7**	**228.5**

Demand related capital expenditure is increasing over the AA4 period to ensure that the opportunities to increase the number of economic new connections are maximised. The timing of demand related capital expenditure is related to the timing of urban development projects. Laying gas pipes in a “common trench” at the same time that other utility infrastructure is being installed means that the cost of connecting new customers would be more efficient than if the gas infrastructure has to be installed separately or retrospectively.

The most significant investment will occur in 2016, which includes the Two Rocks Spur Line and completion of the Elizabeth Quay and Perth CBD risk reduction project.

Figure 72: Forecast growth capital expenditure 2010 to 2019

New housing connections since the global financial crisis (GFC) have been trending lower than previous years. However, in AA4 new housing connections are forecast to recover to pre-GFC levels. This is due to factors such as rising consumer confidence, low interest rates, increasing finance approvals, population migration to Western Australia and increasing lot sales by developers driving the land subdivision activity. A more detailed discussion of housing connections trends is set out in Chapter 5 (Demand).

Greater new housing activity increases the requirement for customer initiated and demand related capital expenditure. Customer initiated capital is discussed further in section (a) below. Demand related capital is discussed in section (b).

NPV growth investment

ATCO Gas Australia has undertaken a NPV analysis of forecast capital expenditure for the AA4 period which indicates that the NPV of the investment after 30 years is $27.0 million.

The analysis has been undertaken using the same approach as the analysis undertaken for the growth capital expenditure for the AA3 period as presented in Chapter 7 (Past Conforming Capital Expenditure). The analysis incorporates customer initiated and demand related capital expenditure net of capital contributions. The forecast volumes and demand are the same as those presented in Chapter 5 (Demand). Tariffs are assumed to decline in real terms by 2 per cent from 2020 as a result of the capital depreciating and no additional capital expenditure. The discount rate reflects the proposed nominal post tax WACC of 8.53 per cent.

(a) **Customer Initiated Capital**

ATCO Gas Australia's Gas Distribution Licence GDL 8 requires that the Network Operator must offer to connect any service that is on line of gas main with up to 20 metres of service line, and accompanying gas meter incorporated, as the "Service Connection". Customer connection and associated mains extensions requests are made via the retailer before being verified and allocated for construction by ATCO Gas Australia.

Customer initiated mains and services installations are forecast based on the expansion and development plans for the Perth metropolitan area. ATCO Gas Australia sought advice from Economics Consulting Services in relation to the expected number of new customer connections and their location (see Chapter 5 (Demand)).[118]

To estimate the activities and costs required to connect customers, ATCO Gas Australia reviewed historical information, overlayed with customer connection initiatives to forecasts a proportion of customer types. Unit costs per connection or length of mains required were taken from actual experience and/or requests for tender from providers. The results were applied to the individual types of connections, along with mains installation methods in order to estimate the total forecast cost.

ATCO Gas Australia generated an estimate for the length of mains extensions, gas feeders and gas mains open trench for each year of the forecast period. Unit costs were derived from analysis of historical and current costs, adjusted for future cost assumptions and trends.

[118] Appendix 03: ATCO Gas Australia Connections Forecast, Economics Consulting Services, May 2013.

New Mains

The cost category ‘Mains extensions’ covers extensions required to connect new customers that are on the Network periphery or in non-serviced areas within the existing Network footprint. ‘Feeders’ and ‘mains open trench’ are gas mains installed in a common trench at the same time as other utilities.

In 2015, a higher ratio of mains installed per customer is forecast. Housing market activity through new starts and subdivision expansion is expected to accelerate, driving an increase in the required mains laid to meet demand. This ratio of mains to services is a phasing issue and is expected to drop after this forecast peak. It is anticipated that the ratio will settle towards the longer term average, resulting in a consistent overall unit cost.

Table 62 shows the actual and forecast quantities and costs for installing mains over AA4. Mains extension costs reflect the cost of excavating and reinstating in a brownfield situation which requires extensive reinstatement of surfaces because installation is undertaken in established urban and industrial areas. Mains in open trench and feeders are generally installed in greenfield developments, where possible in a “common trench” with other utilities.

Table 62: Forecast mains, feeders and extensions

	Length (km)	Forecast cost ($m)	Cost per metre ($)
Meters of mains extension	25.5	3.5	139
Meters of mains open trench	926.9	44.4	48
Meters of feeders	479.1	23.9	50
Total	**1,431.6**	**71.8**	**50**

New services

New Services are the gas infrastructure installed from the gas main to the meter position at the new connection. They include the gas pressure regulator and gas meter.

Table 63 shows the number of new services forecast over the AA4 period.

Table 63: Forecast new services: 2014 to 2019

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Number of B3 connections	6,994	13,430	13,450	13,450	13,450	13,450	**74,224**
Number of feeder connections/cluster connections	2,152	4,260	4,260	4,260	4,260	4,260	**23,452**
Number of B2 Connections	199	370	405	440	475	510	**2,399**

B3 connections are domestic meter connections. B2 connections represent commercial connections. Feeder connections/cluster connections relate to other dwellings such as apartments and flats, medium density developments and aged care estates and consist of clusters of new connections in small open trench developments. Additional analysis of housing connections trends is set out in Chapter 5 (Demand).

Table 64 shows the forecast cost per connection.

Table 64: Forecast new developments, infill services and new family units

	Number	Forecast cost ($m)	Cost per connection ($/m)
Number of B3 connections	74,224	69.5	937
Number of B2 connections	2,399	6.5	2,701
Number of feeder/cluster connections	23,452	8.5	361
Total	**100,076**	**84.5**	**844**

(b) Demand related capital

ATCO Gas Australia forecasts $72.2 million of demand related capital expenditure during AA4. The key demand related projects in AA4 are:

- Two Rocks Spur line
- Peel Spur line
- Elizabeth Quay and Perth CBD risk reduction project
- Baldivis Spur line
- Capel to Busselton Reinforcement.

Table 65 shows forecast demand related capital expenditure for these key projects.

Table 65: Forecast demand related capital expenditure : 2014 to 2019

HP Main ($ million real at 30 June 2014)	July to Dec 2014	2015	2016	2017	2018	2019	Total
Two Rocks spur line	-	-	13.6	13.6	-	-	**27.2**
Peel spur line	-	5.4	-	-	6.0	-	**11.4**
Elizabeth Quay and Perth CBD risk reduction project	2.0	3.1	4.2	-	-	-	**9.3**
Baldivis spur line	-	-	-	-	5.4	-	**5.4**
Capel to Busselton Reinforcement	-	-	-	-	-	5.2	**5.2**
Reinforcements - other[119]	0.7	1.5	5.7	0.8	1.4	0.7	**10.9**
Other capacity upgrades[120]	0.3	0.5	0.5	0.5	0.5	0.5	**2.7**
Total	**3.0**	**10.5**	**24.0**	**14.9**	**13.3**	**6.5**	**72.2**

[119] This includes 20 projects estimated to cost less than $1m each, identified during network modelling as being required to ensure integrity of supply and which include the construction of various mains extensions and regulator stations. Detailed breakdowns of these projects are included in the AMP. Appendix 02: ATCO Gas Australia Asset Management Plan (AA4) 2014-2019, February 2014.

[120] For example, medium pressure (MP) regulator sets and high pressure (HP) regulator sets.

Demand related capital expenditure is forecast using the information contained in *Directions 2031*[121] and the ECS report[122]. *Directions 2031* is a document provided by the WA Planning Commission and establishes a vision for future growth of the metropolitan Perth and Peel region. *Directions 2031* includes forecast dwelling numbers and locations projected to 2031 to guide the detailed planning and delivery of housing, infrastructure and services necessary to accommodate growth in the regions. ATCO Gas Australia incorporates this information when modelling and planning its investment to support the efficient long term development of the metropolitan area.

ATCO Gas Australia uses an industry standard software package called SynerGEE to model and simulate the Network as part of the network planning process. Network planning determines the timely reinforcement and efficient expansion path along which the Network maintains sufficient capacity to meet user demand, given forecasts of end-user demand for natural gas. The physical attributes of the Network are reflected in a model and SynerGEE models the Network's physical attributes and identifies weak pressure areas that require reinforcement to enable the connection of new customers and maintain a reliable supply to customers in the area. These identified pipelines and reinforcements form part of the works programme and are supported by detailed estimates.

Demand related capital expenditure includes costs associated with new high pressure spur lines to support new connections. These spur lines also provide security of supply to new and existing customers, therefore a proportion of the infrastructure costs are allocated to sustaining capital forecasts as outlined in section 8.5.1(b)

Table 66 shows the proposed spur lines and pipelines, their timing, length, overall cost and allocation of these costs between demand and sustaining categories for the AA4 period.

Table 66: Forecast high pressure spur lines and pipelines: 2014 to 2019

HP Main	Timing (year)	Length (km)	Demand $M's	Sustaining $M's	Total Project Cost $M's
Two Rocks spur line	2016/17	44	27.2	18.1	45.3
Peel spur line	2018/19	26	11.4	20.9	32.3
Elizabeth Quay and Perth CBD risk reduction project	2014/16	5	9.3	4.9	14.2
Baldivis spur line	2018	4	5.4	-	5.4
Capel to Busselton reinforcement	2019	5	5.2	-	5.2
Total		**84**	**58.5**	**43.9**	**102.4**

Two Rocks spur line

A new lateral is forecast to be built to connect Two Rocks to the Network in 2016 and 2017. ATCO Gas Australia estimates this project will cost $45.3 million. The project will support the connection of >100,000 new dwellings forecast in Directions 2031 and provide security of supply for 60,000 existing customers.

[121] *Directions 2031 and Beyond*: http://www.planning.wa.gov.au/publications/826.asp.

[122] Appendix 03: ATCO Gas Australia Connections Forecast, Economics Consulting Services, May 2013.

The North Metro HP network currently provides gas supply to more than 390,000 consumers. The North Metro HP network is supplied by three pressure reducing stations (PRS):

- Pinjar, Neaves Road
- Ballajura, Marshall Road
- East Perth, Summers Street

In the event of gas outage from Neaves Road, Ballajura PRS is only capable of supplying gas into the North Metro HP network up to Ocean Reef Road. This would cause pressure within the northern part of the North Metro HP network to drop to levels that would not support the high pressure regulators that supply gas to the medium pressure networks.

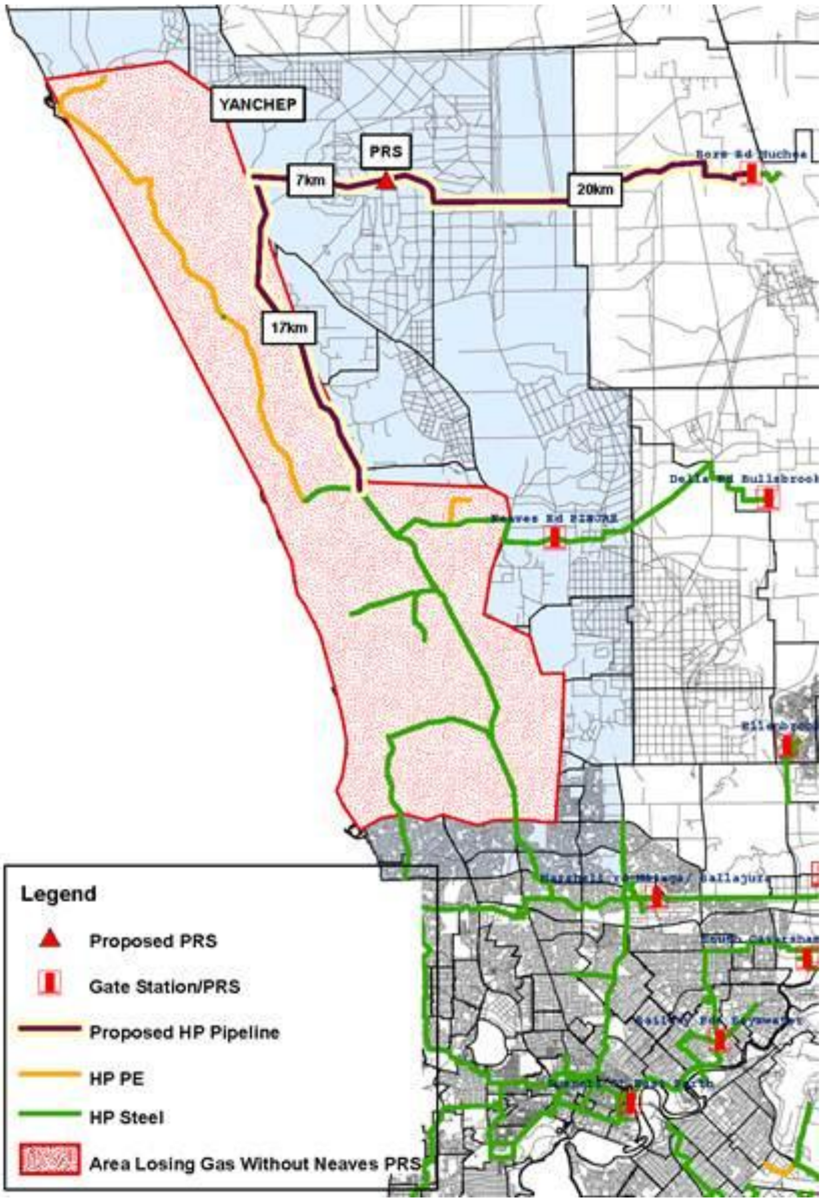
Under these conditions the pressure within the medium pressure and medium-low pressure networks would deteriorate rapidly unless consumer gas supplies are curtailed. Curtailment would result in more than 60,000 customers being without gas supply.

Reinstating gas supply to these customers would involve widespread decommissioning and re-commissioning of pipework and may also include sections of the medium and medium-low pressure networks where air has ingressed into the Network. Gas supply reinstatements and consumer relights would result in many consumers having an extended gas supply outage. The risk associated with customer curtailment, network purging and consumer relights on this scale is assessed as a catastrophic event using the ATCO Gas Australia's risk model, (based on AS 2885).

To ensure continuity of gas supply, ATCO Gas Australia will construct a 44 km steel pipeline. This will comprise 20 km DN250 lateral with MAOP of 6900kPa fed from a gate station to be constructed on the DBNGP and 24 km DN300 with MAOP of 1900kPa and the installation of a PRS. The Class 150 DN300 steel pipeline will be tied-in to the existing Class 150 pipeline at the junction of Wanneroo Road and Hester Avenue. The proposal will also accommodate potential consumers from developments in the North West Metropolitan region, predicted by the WA Department of Planning to be a high growth area over the next 20 years.

Figure 73 shows the location of the proposed high pressure pipeline.

Figure 73: Two Rocks Spur line



The construction of this pipeline in conjunction with the interdependency project described above will provide security of gas supply to North Metropolitan high pressure networks in accordance with AS/NZS 4645. It will also reduce the risk of loss of supply to as low as reasonably practicable in accordance the Safety Case. This option will also accommodate greenfield developments in the North West region.

Elizabeth Quay and Perth CBD Risk Reduction

A $14.2 million investment is proposed to reinforce and rationalise the Perth CBD network. Perth's Metropolitan Redevelopment Authority (MRA) is initiating a requirement for 5-Star Green Star certification for two current major projects: Perth City Link and Elizabeth Quay.

Historically, the MRA only required new developments to be equivalent to the 4-Star Green Star benchmarks. A method of achieving a 5-Star rating is to utilise tri-generation technology where natural gas is used to produce electricity on site while capturing any waste heat to provide heating and air conditioning. Perth City Link involves the development of 19 lots. Elizabeth Quay involves the development of nine lots that may potentially use tri-generation technology. Construction for both of these developments has commenced. Execution of this project may be required in 2014 to coincide with existing excavation activities to reduce reinstatement costs and public disruption.

The City High Pressure (CHP) network is currently operating at 200kPa and fed through four HPR sets from the 1900 kPa high pressure network on Wellington Street. This portion of the high pressure network is the oldest stock of high pressure pipeline, having been constructed in the 1970s.

The likelihood of a network event on the HP 1900kPa pipelines is managed through controls such as pipeline patrol, high pressure locators and the dial before you dig (DBYD) services. However the likelihood of an event cannot be eliminated. Pipeline condition assessments have identified evidence of minor strikes that led to coating damage and corrosion. To reduce the risks associated with this high pressure asset located in the CBD, ATCO Gas Australia proposes to reduce the operating pressure of the network from 1900 kPa to 700 kPa. This involves downgrading the 1900 kPa high pressure main running through Wellington Street and Palmerston Street, to operate at 700 kPa and the installation of three HPRs to support the network (the downgrade works).

Current modelling indicates the CHP network has sufficient pressure and capacity to supply gas to the Perth City Link project. However, for the Elizabeth Quay project the existing CHP network does not have the capacity to supply the forecast tri-generation gas loads and requires a 2km mains extension, operating at 700kPa. The recommended route for this mains extension from the high pressure main on Wellington Street is along Barnett Street and Riverside Drive.

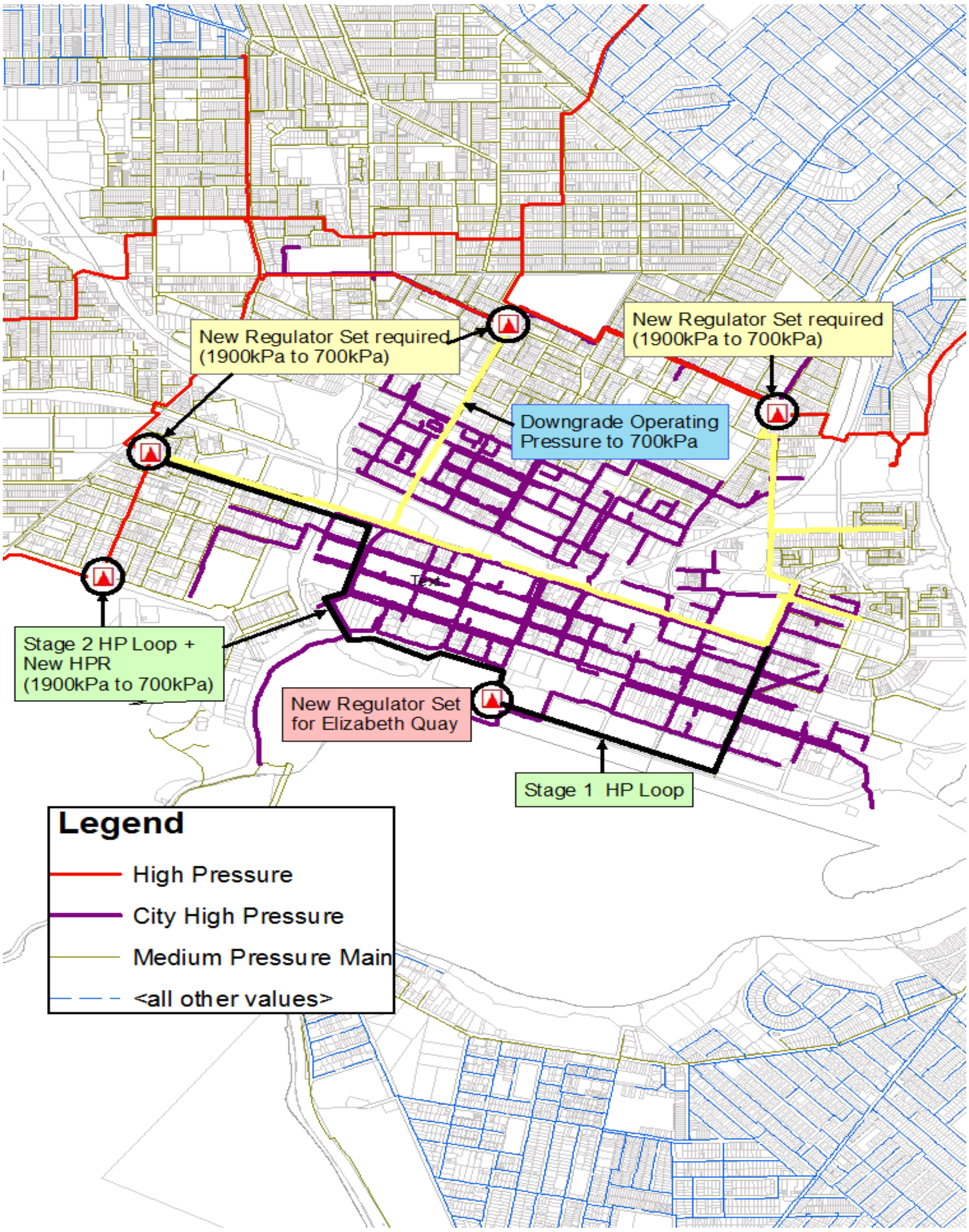
To ensure security of supply to Elizabeth Quay, and the wider CBD an additional 3 km main, operating at 700kPa is required. The recommended route for this main is along Street Georges Terrace, Milligan Street and Wellington Street. The route requires installation of a HPR on the corner of Wellington Street and Loftus Street. In addition, there are existing mains following this proposed route.

In summary, the Elizabeth quay project will require a total of five kilometres of mains and the installation of a HPR to connect the tri-generation gas load.

The downgrade works require the installation of an additional three HPRs to enable the 1900 kPa high pressure main to be downgraded to 100 kPa.. .

Figure 74 shows the work required to support Elizabeth Quay and CBD risk reduction.

Figure 74: Elizabeth Quay and CBD risk reduction



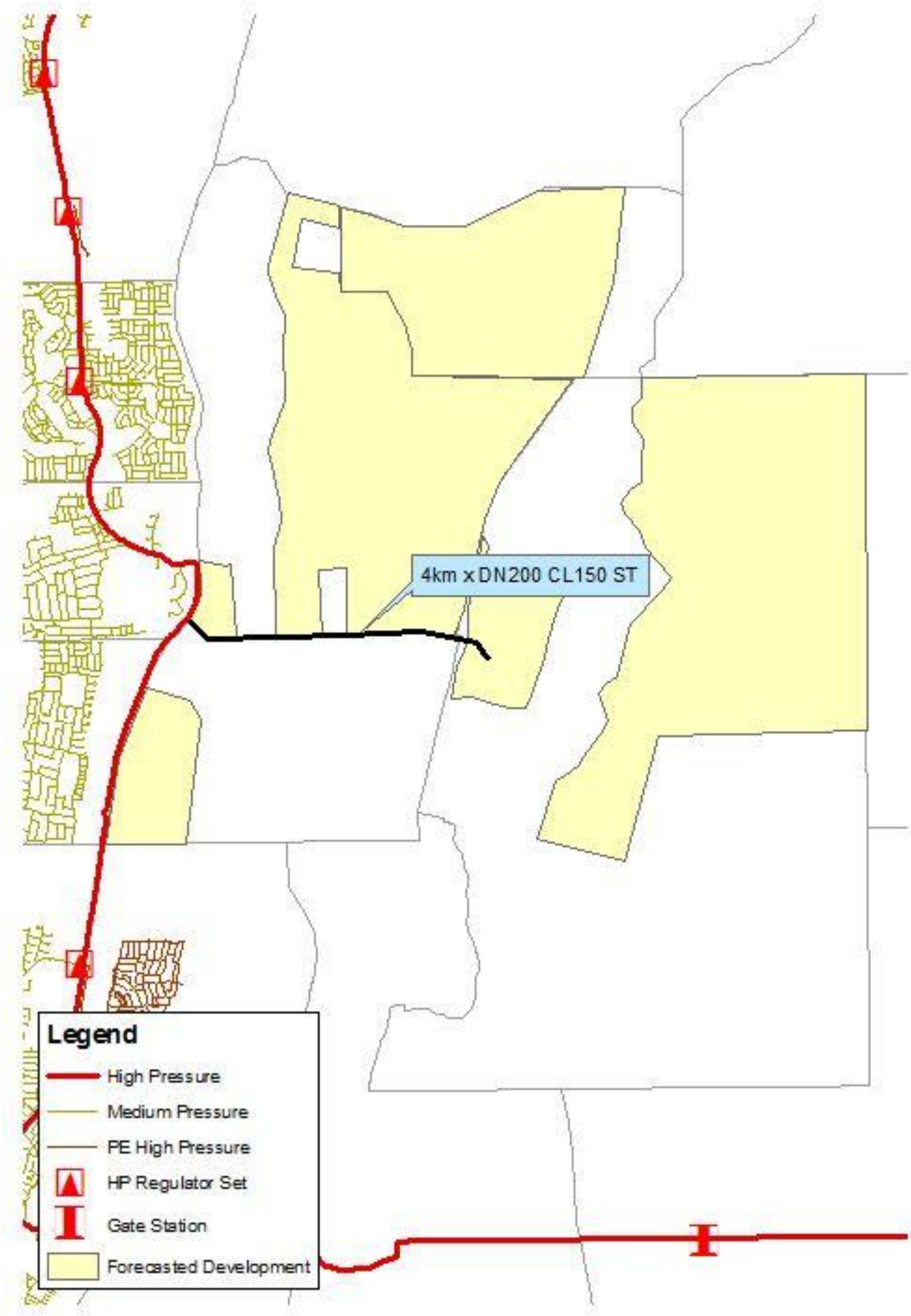
Baldivis spur line

The Baldivis South-Keralup region is located approximately 4 km east of ATCO Gas Australia's steel pipeline with MAOP of 1900kPa in Rockingham. The forecast for this region is that it will grow to more than 63,000 people from a population of approximately 14,000 in 2011, and be serviced by an integrated transport network.

To facilitate timely and efficient expansion of the network, ATCO Gas Australia proposes to construct a steel pipeline with MAOP of 1900kPa, which will support the proposed developments. The pipeline will provide the ability to grow the network efficiently as well as ensuring the capacity to connect developments growing around the pipeline. It is also more cost effective to construct the pipeline in a greenfield project than to develop in a brownfield situation after the development of the area has occurred.

The figure below shows the location of the Baldivis spur line.

Figure 75: Baldivis Spur line



Peel spur line

The Peel Region is expecting significant growth in greenfield residential and commercial developments. This pipeline is essential to economically grow the gas network and has the capacity to supply gas to future domestic and commercial developments in the Peel region. *Directions 2031* forecasts the Peel region will grow by an additional 10,750 residential dwellings and several industrial sites in West Pinjarra, Greenlands and Waroona. The route of the proposed pipeline has been selected to accommodate these greenfield developments.

ATCO Gas Australia forecasts $32.3 million is required in 2018 to 2019 to support this growth and to maintain security of supply for 29,000 existing customers in the event of an interruption to the Mandurah Gas Lateral pipeline.

The first stage of the proposed pipeline (7.1 km x DN150 ST CL150) will connect the Rockingham steel high pressure pipeline to the high pressure PE pipeline in South Yunderup through a HPR. This will provide gas supply to the entire Austin Lakes development. The pipeline will allow the Austin Lakes development to be operated at a Polyethylene High Pressure (PEHP) pressure and support more growth in the surrounding areas.

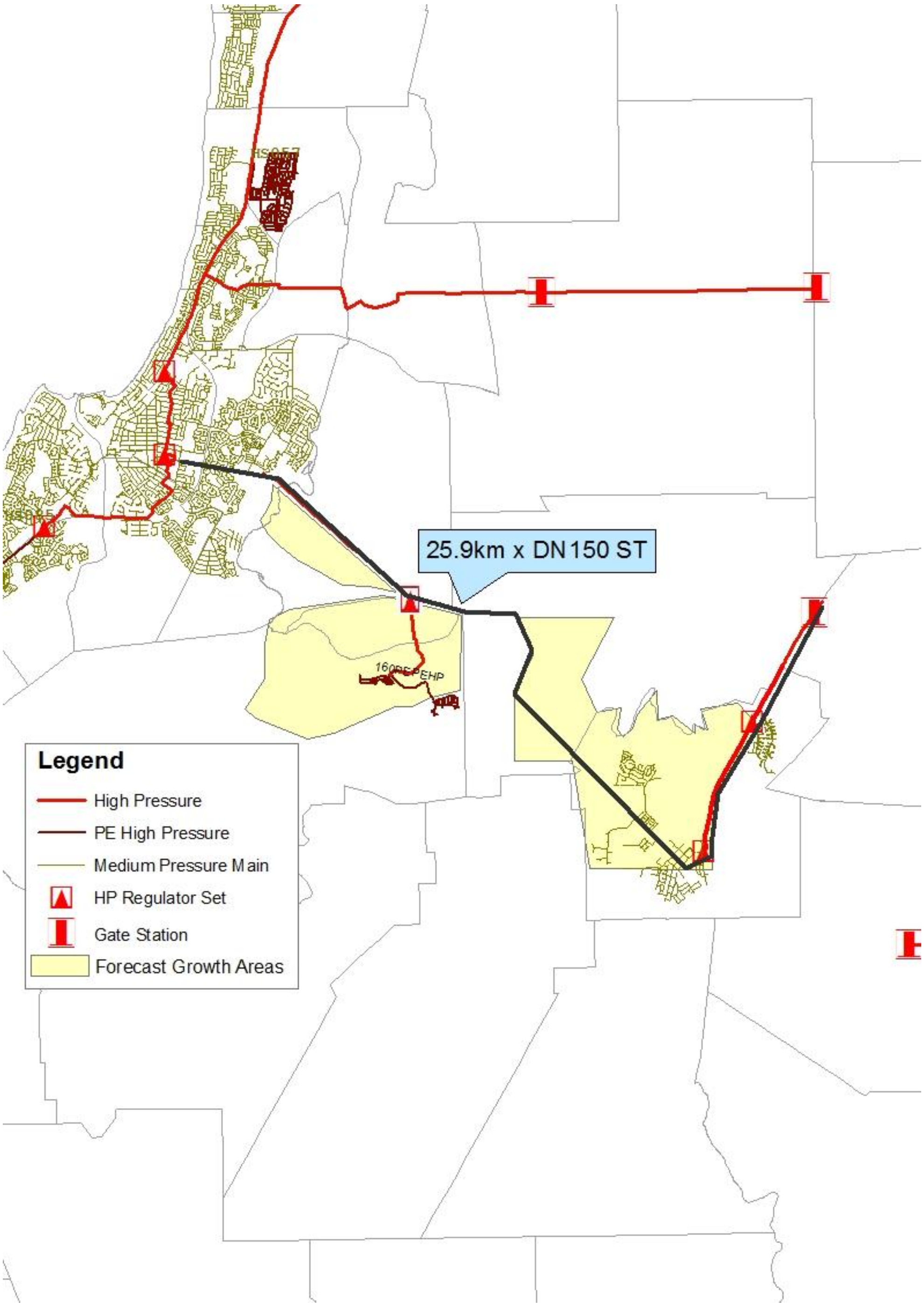
Network modelling indicates the Pinjarra high pressure network will be under-capacity by winter 2017. As part of this project, 3.2km of DN150 CL150 HP steel main will be constructed in 2016 from the outlet of Pinjarra Gate to the tee before HS016. The Pinjarra CL150 reinforcement is an important aspect of the Peel region long term strategy to ensure security of supply to existing customers and increase capacity to facilitate the connection of new customers.

The final stage (15.6 km x DN150 ST) connects to the CL150 ST pipeline Pinjarra high pressure network at HS016. This will reinforce the Pinjarra network and ensure security of supply to the medium pressure Pinjarra distribution network.

In addition to the total 25.9km of DN150 CL150 ST spurline a new gate station is required on the DBNGP transmission pipeline.

Figure 76 shows the location of the Peel spur line.

Figure 76: Peel Spur line



Capel to Busselton reinforcement

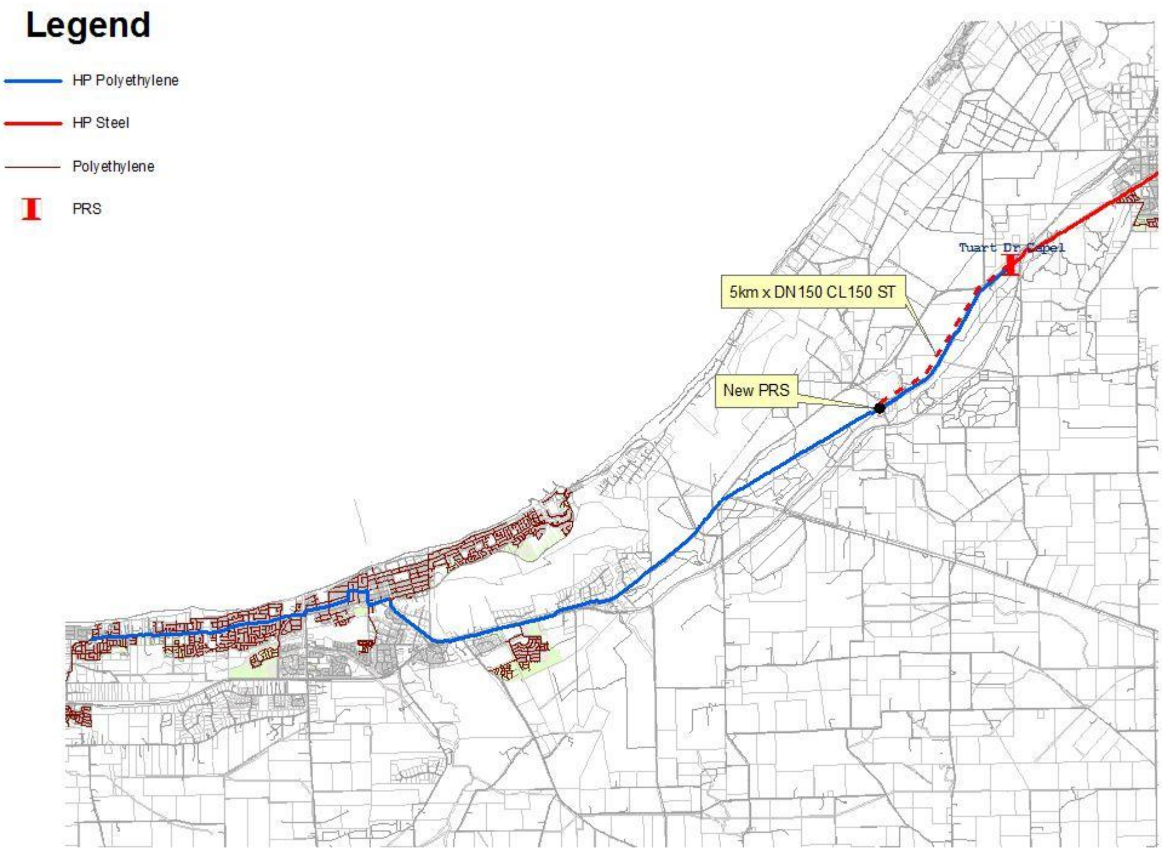
Busselton is forecast to have an annual population growth of 3.1% which is above the state average for the South West region. By 2026, it is expected to have a population greater than 55,000.

Gas is currently being supplied by a Polyethylene pipeline from Capel operating at a MAOP of 600 kPa. This pipeline is limited in capacity and without this high pressure reinforcement project, the high pressure regulator set in Busselton will not have sufficient pressure and capacity to connect new customers to grow the network or maintain gas supply to the area.

Potential low pressure conditions exist within the Busselton region that, under peak winter conditions, would cause consumers to lose supply intermittently in the immediate term and becoming frequent in future years. There is a high risk associated with customer curtailment, network purging and consumer relights on this scale using the ATCO Gas Australia's risk model, which is based on AS 2885. This would also lead to increased operating expenditure from associated relight costs. Implementing this project will address this lack of capacity and facilitate the growth in new connections..

The figure below shows the location of the Capel to Busselton reinforcement.

Figure 77: Capel to Busselton reinforcement



8.6 Structures and equipment

ATCO Gas Australia forecasts $38.4 million of capital expenditure on structures and equipment for the AA4 period. This expenditure covers the costs associated with owning and operating depots, fleet, plant and equipment. Expenditure includes:

- **Operational depots and training centre**: expenditure required to redevelop the training centre and warehouse at the Jandakot site and also to establish new depots to enable emergency response times to be met and to properly house the growing workforce, fleet and emergency equipment ($17.3 million)
- **Fleet**: expenditure on, vans, utilities, trucks, motorbikes, trailers, compressors, excavators and passenger vehicles ($14.5 million)
- **Plant and equipment**: expenditure on plant and equipment such as high and low pressure flow-stopping equipment, underground services detection equipment, gas detectors and polyethylene welding equipment ($6.6 million)

Table 67 shows forecast capital expenditure for structure and equipment for each category.

Table 67: Forecast capital expenditure structures and equipment in 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Operational depots and training centre	1.0	14.3	1.2	0.8	-	-	**17.3**
Fleet	2.1	1.2	0.8	1.4	4.6	4.4	**14.5**
Plant and equipment	0.6	1.2	1.5	1.3	1.0	1.0	**6.6**
Total	**3.7**	**16.7**	**3.5**	**3.5**	**5.6**	**5.5**	**38.4**

To deliver a safe and reliable service to its customers, ATCO Gas Australia will own and operate purpose designed operational depots, fleet and supporting equipment. This will help to ensure it meets Safety Case obligations for a timely and effective response to network events over a growing network footprint and customer numbers over the long term. It has been determined, following financial assessment, that the lowest sustainable cost is achieved through a prudent long term ownership strategy, which means lower costs to customers due to reduced operational expenditure. Ownership and efficient operation of plant and fleet allows ATCO Gas Australia to deliver value to customers while providing the flexibility to adapt to changing customer and operational demands.

ATCO Gas Australia's investment proposal in structure and equipment is driven by its AMP, which includes the requirements for depots, fleet, training facilities designed to meet Safety Case obligations.

8.6.1 Operational depots and training centre

ATCO Gas Australia will own and operate six operational depots in addition to the Jandakot operational centre. These depots will be located in Bunbury, Busselton, Joondalup, Geraldton, Osborne Park and Mandurah. This model is required to enable compliance with the Safety Case by meeting emergency response time service levels. The move away from four existing short term lease agreements to an own-and-operate model will also allow the business to provide services at lowest sustainable cost.

ATCO Gas Australia's strategy is to locate resources, both personnel and equipment, in areas where it can serve customers more efficiently throughout the entire Network. Having equipment available locally to incidents will also minimise response times, allowing work crews to respond to broken mains and services within one hour.

Table 68: Forecast capital expenditure on operational depots and training centre: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Joondalup	-	1.6	-	-	-	-	**1.6**
Osborne Park	-	7.0	-	-	-	-	**7.0**
Busselton	-	-	1.2	-	-	-	**1.2**
Bunbury	-	1.1	-	-	-	-	**1.1**
Geraldton	-	-	-	0.8	-	-	**0.8**

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Jandakot operational facilities	1.0	-	-	-	-	-	**1.0**
Training facility	-	4.6	-	-	-	-	**4.6**
Operational depots and training centre	**1.0**	**14.3**	**1.2**	**0.8**	**-**	-	**17.3**

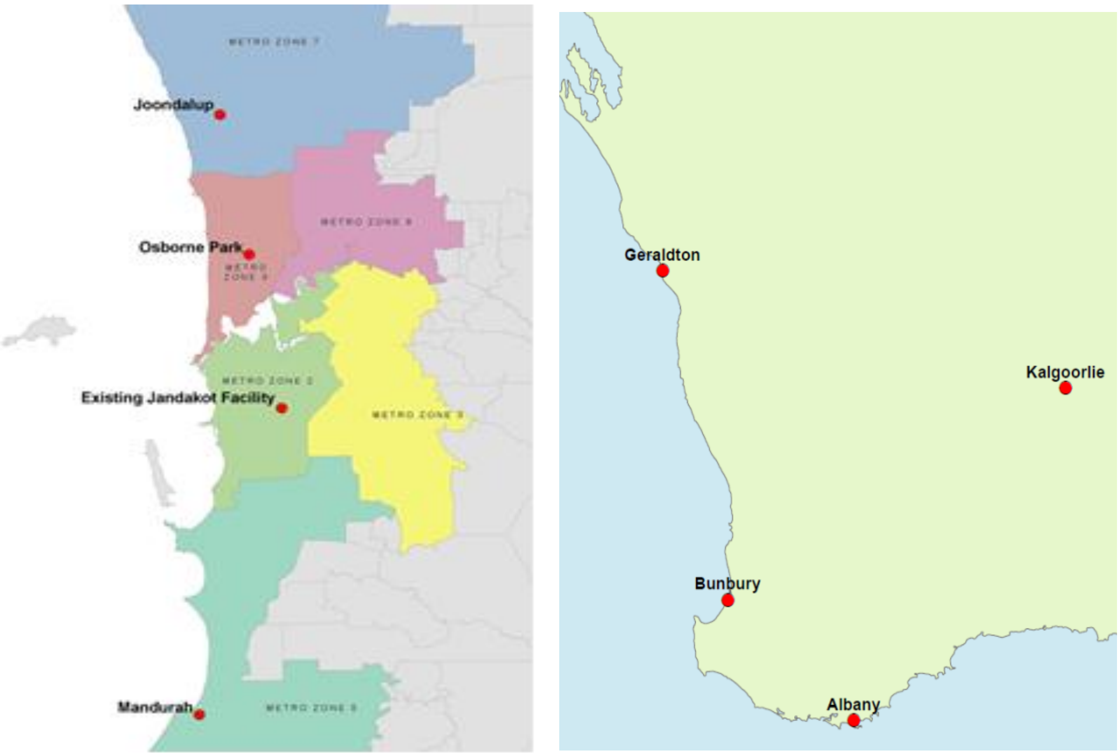
The new facilities will be designed to meet ATCO Gas Australia's current and future operational requirements and will include:

- Secure yard areas to store trailers, compressors and other heavy equipment
- Vehicle bays to store, maintain, inspect, and re-stock vehicles and equipment
- A secured materials area
- A waiting area for customers
- A change area for crews
- Meeting rooms
- Office space for employees

Operating depots shall be designed to be energy efficient and provide appropriate access for staff and visitors with a disability.

With regard to the new depot locations, ATCO Gas Australia proposes to split the northern and southern metro areas into three zones and the Bunbury/Busselton district into two zones. This split will ensure the one hour emergency response coverage can be maintained. The maps below show the proposed location of the new depots.

Figure 78: Proposed location of the new depots



The proposed depot locations takes into account forecast network growth and the WA Department of Planning's *Directions 2031* projections.

North

ATCO Gas Australia currently leases an operational depot in Wangara. The lease arrangement is due for re-negotiation during 2014. ATCO Gas Australia proposes to own operational depots in Osborne Park and Joondalup. The Wangara depot leasing arrangement will be retired.

Osborne Park offers excellent access to main arterial roads and mass transit infrastructure for the north metro area as well as optimal lot sizes for operational needs. Osborne Park provides good access to building industry stakeholders and marketplace exposure that would align to ATCO Gas Australia's customer growth strategies. Joondalup provides access to main arterial roads and mass transit infrastructure as well as optimal lot sizes for ATCO Gas Australia operational needs and provides emergency response coverage to the high growth north west metropolitan area.

The existing Geraldton Depot lease is due for re-negotiation in 2015. Though the current site is appropriately located for the township and lateral network activity, ATCO Gas Australia considers that the construction of a purpose-designed depot will provide more cost effective long term solution for providing services to customers.

South

ATCO Gas Australia currently leases operational depots in Mandurah and Bunbury. The leases are due for re-negotiation in 2014 and 2015 respectively. The Mandurah lease will not be renewed and a depot is forecast to be purchased during AA3, although specific timing of the purchase will be dependent on suitable stock becoming available. Similarly the Bunbury depot lease will not be renewed and ATCO Gas Australia will purchase its own depot facilities in Bunbury and Busselton to properly service the network footprint.

Mandurah offers excellent access to main arterial roads and mass transit infrastructure as well as optimal lot sizes for ATCO Gas Australia operational needs. The current leased facility does not meet operational needs as growth in the region has resulted in a lack of parking, hardstand, office and store facilities to meet requirements. The site is also shared with other tenants, which introduces risks of third party vehicles and operating practices around the working area. Addressing current safety concerns would be expensive and provide a short term benefit given the lease arrangements. Establishing a new site enables the safety and operational requirements of ATCO Gas Australia to provide benefits over a longer period of time.

Bunbury offers excellent access to main arterial roads and is well located for access to Bunbury and surrounding areas. The existing facility is adequate for current operations, however, projected growth means relocation is required during the access arrangement period.

Busselton requires a dedicated satellite operation due the forecast network growth in the region and emerging limitations, such as higher density traffic conditions in reach from Bunbury to cover emergency response.

Jandakot operational facilities redevelopment

The Jandakot operational facilities, including warehouse, gas testing and stores areas are to be rationalised and upgraded to ensure compliance with occupational health and safety requirements and current building regulations. The upgraded facilities will be designed to be energy efficient and provide appropriate access for staff and visitors with a disability. The facilities will be designed for employees to reduce manual handling of materials, safely maintain vehicles, store equipment and secure materials

Training facility redevelopment

To comply with the Gas Standards (Gas Supply and System Safety) Regulations 2000 (GSSSR 2000) ATCO Gas Australia is required to ensure, so far as is reasonable and practicable, that any employee or contractor engaged in carrying out a prescribed activity is given instruction and training, and tested for competence, in how to safely apply and use those standards, procedures and practices.

ATCO Gas Australia has an in-house dedicated training and assessment team to instruct, train and assess employees and contractors. Implementation of the Safety Case has resulted in significant changes to operational procedures, which has driven a corresponding increase to the volume and complexity of training activities.

To meet Safety Case obligations, the existing training facility in Jandakot will need to be re-developed to accommodate the increased training requirements. The redevelopment will provide sufficient capacity, classroom facilities, practical training and assessment areas. It will achieve the lowest sustainable cost by avoiding the expense of third party resources and facilities.

The proposed redevelopment will provide the following facilities:

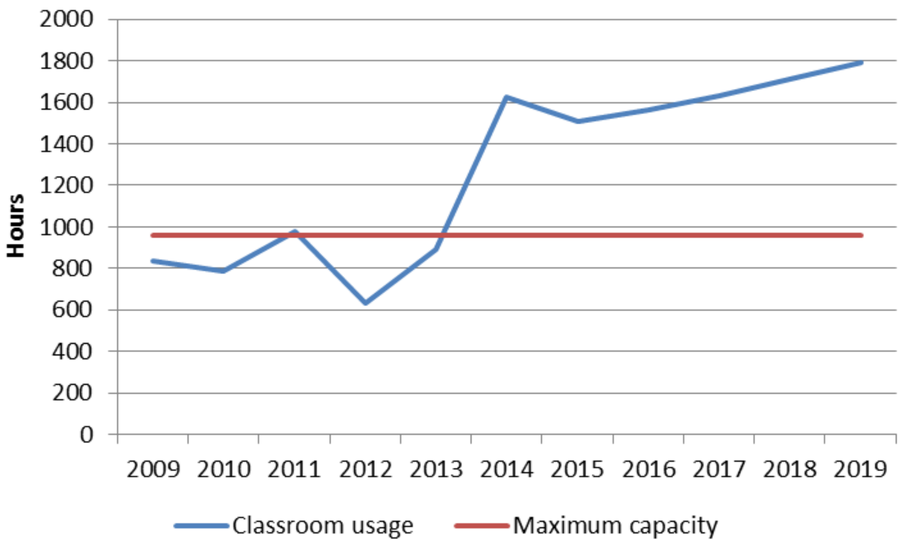
- **External raised training area** - used for locating, proving and protecting the asset, manual excavation, use of an excavator, excavator spotter, installation of mains, services and meter boxes, testing and commissioning of mains and services, leak survey, trench padding and compaction, back filling and pipe marking. The current fire training pit will need to be relocated due to its proximity to site buildings
- **Assessment centre** – allowing independent personnel competency assessments to be carried out in a realistic, simulated and controlled environment. Differing faults

can be applied to a range of scenarios enabling trainers to assess operatives' competence

- **Research and development laboratory** - required for testing new tools, equipment and network elements before field trials. If accredited to National Association of Testing Authorities (NATA) level, a calibration resource and adequate facilities will allow ATCO Gas Australia to reduce costs of testing and calibration of instruments, tools and equipment

Accounting for growth in the number of competent personnel required to safely apply and use standards, procedures and practices, Figure 79 shows forecast classroom contact hours compared to maximum capacity of current facilities.

Figure 79: Classroom delivery hours: actual and forecast compared with capacity of training facilities in 2013



8.6.2 Forecast fleet capital expenditure

ATCO Gas Australia's fleet is comprised of vans, utilities, trucks, motorbikes, trailers, compressors, excavators and passenger vehicles. Table 69 shows forecast capital expenditure on fleet during the AA4 period.

Table 69: Forecast fleet capital expenditure: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Fleet	2.1	1.2	0.8	1.4	4.6	4.4	**14.5**

ATCO Gas Australia's fleet ownership strategy was implemented during 2013. The majority of fleet was replaced over the year, all of which had reached their end of useful life. There will be a corresponding expenditure peak in 2018 as these vehicles reach their five-year replacement cycle.

Fleet ownership and management achieves the lowest sustainable cost of providing services over the longer term.

Ownership creates efficiencies in vehicle usage through the interchange of vehicles made possible by the use of common purpose-built vehicle types. Fleet ownership also reduces the risk of increasing lease costs, inertia costs and 'over kilometre' costs when leased vehicles are not replaced in a timely manner.

A summary of the different vehicles types within the fleet and their forecast timings are outlined below.

Table 70: Forecast of fleet by type: 2014 to 2019

Vehicle Type	Approximate Base Unit Cost	Forecast units for fleet					
		Jul to Dec 2014	2015	2016	2017	2018	2019
Truck	$200,000	5	2	2	4	4	5
Bobcat	$80,000	1					
Utility	$60,000	13	7	2	4	28	31
Van	$60,000	1	1	2			17
Wagon	$55,500		4	2	5	34	6
Sedan	$45,000				2		
Excavator	$35,000	6	2	2		6	7
Trailer	$15,000	4				3	
Motorbike	$7,500		1				
Total		**30**	**17**	**10**	**15**	**75**	**66**

8.6.3 Plant and equipment

Plant and equipment is critical to safely undertake planned and reactive operational activities. Typical plant and equipment is high and low pressure flow-stopping equipment used in emergency response scenarios to safely isolate gas supply and control the release of gas. This equipment is also used for planned flow stopping and new main connections.

Other equipment includes underground services detection equipment for third party damage prevention, gas detectors and polyethylene welding equipment. Table 71 shows forecast capital expenditure for plant and equipment during the AA4 period.

Table 71: Forecast plant and equipment capital expenditure: 2014 to 2019

$ million real at 30 June 2014	Jan to Jul 2014	2015	2016	2017	2018	2019	Total
Plant and equipment	0.6	1.2	1.5	1.3	1.0	1.0	**6.6**

- **Flow stopping –** This equipment is used to safely stop the flow of gas when isolating a section of gas mains for such things as connecting new subdivisions to grow the network, to accommodate network alterations and to isolate the supply of gas in the event of an emergency. It encompasses a variety of equipment to flow stop the different material types such as metallic, PVC and Polyethylene mains across the different pressure ranges on the network

- **Underground asset detection** – Consistent with good industry practice, this equipment is used to assist in the prevention of damage to underground infrastructure by identifying and locating underground assets prior to, and during, excavation activities. Prevention of underground damage is essential to mitigate the risks to personnel and the general public and underground asset strikes, as well as prevent interruptions to supply of other underground asset owners and their customers

- **Gas detector units** – These units are essential to ensure successful commissioning and decommissioning activities by accurately reading gas levels, and therefore preventing an uncontrolled gas and air mixture that could potentially be explosive. Units are also used in locating and classifying gas leaks on the asset and are key tool in safe guarding both people and property

- **Polyethylene welding and fusion –** Consistent with good industry practice the new gas network is predominantly constructed using polyethylene. To ensure that joining new pipes together, or welding on fittings to facilitate operational activities, this equipment is essential

- **Pressure testing –** To ensure compliance with AS/NZS 4645 and AS 2885 testing requirements, assets are pressure tested to ensure they are fit for purpose. The different operating pressures of the network require different equipment to ensure compliance to these requirements

- **Fleet fit out** – After the purchase of new fleet vehicles they must have all necessary equipment to ensure it is operationally ready and fit for purpose before being utilised by personnel

8.7 IT capital expenditure

ATCO Gas Australia will invest $27.4 million in IT capital over the AA4 period. This expenditure will comprise:

- **Network operation** - supporting operational improvements in the planning, management and delivery of network operation activities

- **Commercial operations** - improvements to the capture, management and analysis of information in relation to the delivery of accurate and timely metering and billing data to the market in line with commercial and regulatory obligations

- **Business support improvements** – requirements to establish and maintain a single view of the asset (SVA) to assure consistent analysis and reporting on company data, compliance to regulatory obligations and standards

- **Business support upgrades** - increase in software licences due to workforce growth and replacement of IT infrastructure that has reached the end of its useful life

- **IT hardware and software –** IT hardware and software supporting operational improvements in the planning, management and delivery of network operation activities

Table 72 shows the IT capital expenditure forecast by business driver.

Table 72: Forecast IT capital expenditure by business driver in AA4

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Network operation	0.6	2.0	2.6	2.3	3.1	2.1	**12.6**
Commercial operation	1.1	2.8	1.8	0.8	0.5	1.1	**8.1**
Business support improvements	0.5	0.6	0.5	0.8	0.8	0.9	**4.1**
Business support upgrades	0.2	0.2	0.2	0.4	0.5	0.3	**1.9**
IT hardware and software	0.0	0.2	0.2	0.1	0.1	0.1	**0.7**
Total	**2.4**	**5.8**	**5.3**	**4.4**	**5.0**	**4.5**	**27.4**

ATCO Gas Australia's IT Asset Management Plan[123] identifies projects for each business driver and provides costing information for each year of the AA4 period.

IT capital expenditure is required to manage and operate the network to maintain the integrity of services and properly capture and manage information to comply with regulatory obligations and requirements.

AA4 forecast IT capital expenditure is driven by the requirements of the business and operation in relation to metering and billing, the implementation of the field mobility project, initiatives to improve the customer experience and network data visualisation project.

ATCO Gas Australia's IT Capital expenditure forecast for the AA4 (2014 – 2019) portfolio is driven by four principle categories:

- **Network Operations** – IT business systems dedicated to support the operations of ATCO Gas Australia's Gas Distribution System (GDS) ensuring delivery of gas to consumers is reliable, safe and efficient and in accordance with relevant standards and regulatory requirement

- **Commercial Operations –** IT business systems supporting the delivery of accurate and timely metering data and billing data to Retailer and Market in-line with commercial and regulatory obligations

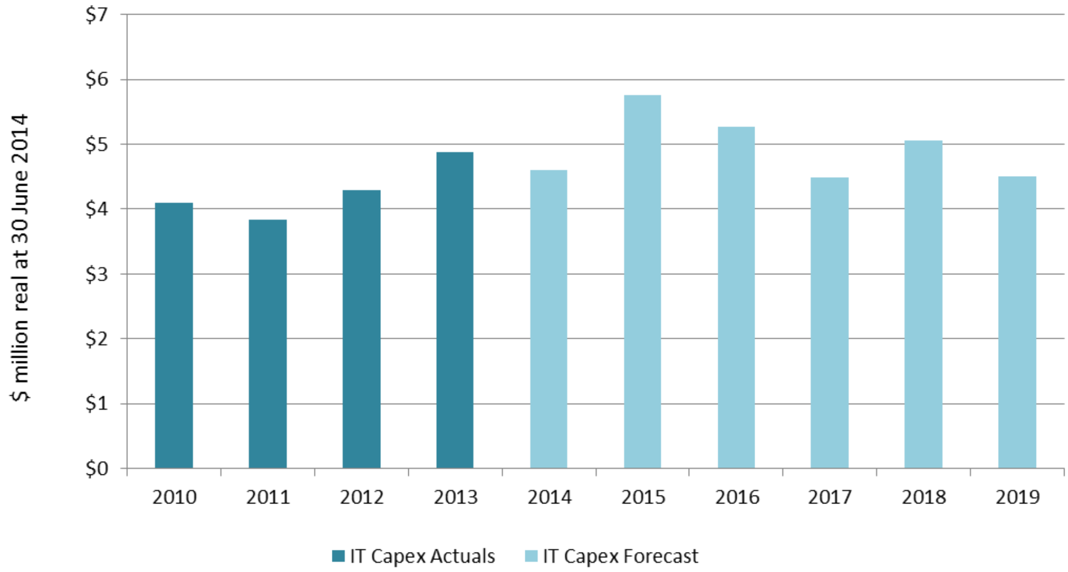
- **Business Support Improvements –** Solutions, required to establish and maintain a Single View of the Asset (SVA) required to assure consistent analysis and reporting on company data, compliance to regulatory obligations and standards and ensure data management 'best practices'

- **Business Support Upgrades** – Hardware and IT infrastructure: End-of-life IT infrastructure and software licensing to meet organic growth

Figure 80 shows forecast and historical IT capital expenditure.

[123] Provided in confidential Appendix 30: ATCO Gas Australia IT AMP, March 2014.

Figure 80: Historical and forecast IT capital expenditure



8.7.1 IT service agreement supporting strategic initiatives

ATCO Gas Australia receives IT services from ATCO I-Tek Australia (I-Tek) under a contractual agreement known as the Information Technology Services Agreement (ITSA). The agreement was created between WestNet Infrastructure Group Ltd and WA Gas Networks Pty Ltd in 2010 and expires at the beginning of 2015. ATCO Gas Australia is conducting a review of its options in respect of the replacement of the existing ITSA, its post ITSA IT service delivery model, and the selection of an IT service provider. The forecast IT expenditure is based on an assumption that it continues to receive service from ATCO I-Tek.

The ITSA outlines how the IT assets and services are to be provided, including the funding arrangements for IT assets owned by ATCO Gas Australia. ATCO Gas Australia funds direct IT capital projects through project agreements. All IT capital projects are supported by business cases.

ATCO Gas Australia's strategic IT initiatives are designed to ensure it continues to operate and maintain the Network cost effectively, and in compliance with its obligations pursuant to its Gas Distribution License, the Retail Market Rules and the National Gas Access (Western Australia) Legislation.

When providing reference services, ATCO Gas Australia must collect, generate, analyse, and retain significant amounts of business information in a secure fashion. The types of business information that must be collected ranges from meter details to field completion reports for operating, maintaining, and expanding the Network.

The collection, retention and appropriate/secure dissemination of business data require a current and up-to-date suite of information technology systems. ATCO Gas Australia's current IT systems and ongoing support required for those systems are detailed in the IT Asset Management Plan.[124] It includes an assessment of the current status of those systems and required improvements, enhancements, upgrades or replacement. Further,

[124]Provided in confidential Appendix 30: ATCO Gas Australia IT AMP, March 2014.

the plan identifies additional business processes that can be provided more efficiently through the use of new IT systems

Main areas of focus for the AA4 period are as follows:

- Leverage technology investment in existing technologies or those used by other companies within the ATCO Group
- Store, archive and protect company information for retrieval as required by business operations for effective knowledge management
- Effectively manage system risk by ensuring disaster recovery capacity meets business continuity plan requirements.

8.7.2 Identified IT initiatives

IT capital projects for the AA4 period have been forecast based on a review of the following:

- Network infrastructure asset management plan and Safety Case
- Marketing and business development plan
- Regulatory reporting requirements and changes to legislation and rules
- Continuous improvement requirements for existing business systems
- Environmental scan of new issues and technologies

The plan also provides information on how the costs for each project has been estimated. Key initiatives are outlined below:

- **Strategic asset management** - To enable safe, reliable and prudent asset management decision making, ATCO Gas Australia requires an IT solution that will enable it to clearly identify asset health, performance and condition for ageing assets. To provide the information required to make these decisions, various business processes across various asset classes require re-engineering and integration. With these redeveloped business processes, ATCO Gas Australia will be able to better target areas requiring asset creation, maintenance and replacement and deliver more efficient direction of maintenance expenditure to allow for reduced lifecycle costs. This initiative also includes implementing an asset performance and condition management solution
- **Business process standardisation** - To implement ATCO Gas Australia's Integrated Business Management system (iBMS) to effectively manage activities associated with owning and operating the Network. The new iBMS will integrate core management system components, such as policy management, risk assessment, training and competence, communication, document control, audit programme and management review processes into the existing integrated management system. The changes will be adopted to meet the requirements of ISO 55001:2014, AS/NZS 4804:2001, ISO 14001:2004 and ISO 9001:2008
- **Management information system (MIS) business intelligence project** - in 2012 ATCO Gas Australia reviewed its management information system. The review found that in order to meet required data security standards, minimise duplication of data storage and maintain data accuracy, a single-view of the asset (SVA) must be established

- **Neon replacement** - ATCO Gas Australia currently uses Neon to receive and process network meter data from remote terminals. The processed data is then transferred to the gas distribution billing data verification (GDBDV) and gas monitoring data (GMD) systems for further processing and delivery to the NMIS application, the Retailers, and the market regulator REMCo. The scope of this project includes the review, design, and implementation of a new Neon replacement solution as a result of the system reaching the end of its life.

- **Commercial services** - There are a number of IT capital requirements forecast within the AA4 period in the metering & billing and regulatory areas. Applications include: NMIS Billing System, Gas Distribution Billing Data Verification (GDBDV), Gas Inflows Management System (GIMS) and the Interval Metering Data (IMD) website

- **Geographical information systems (GIS) continuous improvements** - This project refers to the collection of applications and databases that provide the single source of truth of the Network design. In partnership with ATCO Gas Australia's Enterprise Resource Planning System (SAP), it forms the Asset Management Solution for the Network

- **Field mobility** - Field mobility was implemented in 2013 and was instrumental in changing how ATCO Gas Australia manages its works programme. Field crew can now receive and complete their assigned jobs automatically via their field devices. The devices also store up-to-date work instructions (eliminating the requirement for printed paper-based copies) and have a GPS signal which allows the control room to assign emergency fault work to crews who are within the vicinity of the fault.

As the initial phases of the field mobility solution are implemented there is a requirement to add functionality. This includes:

- Integration of employee skill and training profiles with job and task assignment

- Improved integration of field mobility field devices with ATCO Gas Australia's geo-spatial database

- Linkage to ATCO Gas Australia's health, safety and environment system to ensure one-time recording of HS&E field observations and automated follow-up tracking

- Recording of specific job and work process timing in a move toward activity based cost accounting for field based work and lifecycle replacement of field devices

- ATCO Gas Australia forecasts a growth rate of 15 devices per annum. This is based on ten devices per year for functionality growth and expansion to further business areas, and an additional five devices for organic workforce growth. The devices have a useful life of 5 years. A device replacement programme has been scheduled for 2018.

9. The Capital Base

9.1 Key messages

- ATCO Gas Australia has established the opening capital base and projected capital base in accordance with the National Gas Rules:
  - The opening capital base at 1 July 2014 is $1,020.0 million
  - The projected capital base at 31 December 2019 is $1,357.1 million
- The opening capital base includes $273.9 million in past conforming capital expenditure estimated for the AA3 period less depreciation of $133.5 million consistent with the depreciation forecast for the AA3 period
- The projected capital base includes $605.7 million in forecast capital expenditure
- The depreciation subtracted from the projected capital base over the AA4 period is the sum of:
  - Straight line depreciation on all new capital expenditure adopting the historical cost accounting method
  - Straight line depreciation on the opening capital base adopting the current cost accounting method deducting an amount for the double count of inflation
- The change to the accounting method is required to be consistent with the change to rule 87, which requires the allowed rate of return for a regulatory year to be determined on a nominal vanilla basis. The application of a nominal rate of return utilising the current cost accounting method results in inflation being provided twice – through the rate of return and through an increase in the value of the capital base
- The approach to be adopted consistent with the new rule 87 reduces the price to customers in the longer term as the value of the capital base does not grow with inflation. ATCO Gas Australia proposes a transition period to mitigate the short term price impact that results from the change in approach
- A Fixed Principle is proposed to ensure the full transition to the new approach is complete by 1 January 2025

9.2 National Gas Rules (NGR) requirements

Rule 77 of the NGR requires the opening capital base to be the opening capital base at the commencement of the earlier access arrangement period, plus conforming capital expenditure made during the earlier period, plus any amounts under rule 82, 84, and 86, less depreciation over the earlier access arrangement period, less redundant assets and disposals.

Rule 78 requires that the projected capital base be the opening capital base plus forecast capital expenditure less depreciation and disposals.

Rule 89 outlines the requirements in relation to depreciation. Rule 89 (1) states that the depreciation schedule should be designed:

(a) *so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services; and*

(b) *so that each asset or group of assets is depreciated over the economic life of that asset or group of assets; and*

(c) *so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets; and*

(d) *so that (subject to the rules about capital redundancy), an asset is depreciated only once (ie that the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the AER permits, for inflation)); and*

(e) *so as to allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.*

Rule 89 (2) states that compliance with subrule (1)(a) may involve deferral of a substantial proportion of the depreciation, particularly where:

(a) *the present market for pipeline services is relatively immature; and*

(b) *the reference tariffs have been calculated on the assumption of significant market growth; and*

(c) *the pipeline has been designed and constructed so as to accommodate future growth in demand*.

The ERA's discretion under rule 89 is limited.

Rule 90 requires that an access arrangement must contain provisions governing the calculation of depreciation for establishing the opening capital base for the next access arrangement including whether depreciation is to be based on forecast or actual capital expenditure.

9.3 Establishing the opening capital base

The opening capital base for the AA4 period (from 1 July 2014) is calculated to be $1,020.0 million. The opening capital base is derived in accordance with rule 77(2):

- The opening capital base as at the commencement of the third access arrangement period (1 January 2010) is $879.7 million

plus

- Conforming capital expenditure incurred or forecast to be incurred during the period 1 January 2010 to 30 June 2014 of $273.9 million

plus

- Any amounts to reflect re-used capital contributions, speculative investment or the re-use of redundant assets in accordance with rules 82, 84 and 86 (none identified)

less

- Depreciation forecast for the period 1 January 2010 to 30 June 2014 of $133.5 million

less

- Redundant assets or asset disposals (none identified)

$273.9 million in past conforming capital expenditure is proposed to be added to the opening capital base for the period 1 January 2010 to 30 June 2014. This amount is explained Chapter 7 (Past conforming capital expenditure).

The amount of depreciation deducted from the opening capital base reflects the depreciation forecast for the period 1 January 2010 to 1 July 2014 and is presented in the table below.

Table 73: Depreciation (by asset class) to be deducted from the opening capital base: 2010 to 2014

$ million real at 30 June 2014	Jan to July 2010	2010/11	2011/12	2012/13	2013/14	Total
High pressure mains - steel	1.2	2.5	2.5	2.5	2.7	**11.4**
High pressure mains – PE (poly-ethylene)	-	0.0	0.0	0.0	0.1	**0.1**
Medium pressure mains	2.7	5.5	5.5	5.5	5.5	**24.7**
Medium/low pressure mains	2.7	5.5	5.7	5.9	6.2	**26.0**
Low pressure mains	0.7	1.3	1.3	1.3	1.3	**5.9**
Regulators	0.3	0.7	0.7	0.7	0.7	**3.1**
Secondary gate stations	0.1	0.2	0.2	0.2	0.2	**0.9**
Buildings	0.0	0.1	0.1	0.3	0.3	**0.8**
Meter and services pipes	4.2	8.7	9.7	10.8	11.9	**45.3**
Equipment and vehicles	-	0.7	0.7	0.7	0.7	**2.8**
Vehicles	-	-	-	-	-	**-**
Information technology	0.5	1.6	2.7	3.4	4.3	**12.5**
Full retail contestability	-	-	-	-	-	**-**
Land	-	-	-	-	-	**-**
Total depreciation	**12.4**	**26.8**	**29.1**	**31.3**	**33.9**	**133.5**

Table 74 sets out the calculation of the opening capital base.

Table 74: Opening capital base: 2010 to 2014

$ million real at 30 June 2014	Jan to July 2010	2010/11	2011/12	2012/13	2013/14
Opening capital base at 1 January 2010	**879.7**	898.5	913.5	923.3	971.6
Plus: Conforming capital expenditure	31.1	41.7	38.9	79.7	82.4
Plus: Included capital contributions	-	-	-	-	-
Plus: Speculative investment	-	-	-	-	-
Plus: Re-used redundant assets	-	-	-	-	-
Less: Forecast depreciation	12.4	26.8	29.1	31.3	33.9
Less: Asset disposals	-	-	-	-	-
Less: Redundant assets	-	-	-	-	-
Opening capital base at 1 July 2014	**898.5**	**913.5**	**923.3**	**971.6**	**1,020.0**

9.4 Projected capital base

The projected capital base at 31 December 2019 is $1,357.1 million. The projected capital base has been determined consistent with the requirements of rule 78 as follows:

- Opening capital base at 1 July 2014 of $1,020.0 million

plus

- Forecast conforming capital expenditure (excluding forecast capital contributions) $605.7 million

less

- Forecast depreciation of $113.0 million

less

- Disposals forecast for the period commencing 1 July 2014 (none identified)

9.4.1 Forecast conforming capital expenditure

ATCO Gas Australia has forecast $605.7 million in conforming capital expenditure over the period 1 July 2014 to 31 December 2019. The forecast conforming capital expenditure includes $613.4 million in capital expenditure less $7.7 million in capital contributions. Forecast capital expenditure is outlined in chapter 8 (Capital expenditure).

Table 75 presents the conforming capital expenditure net of forecast capital contributions

Table 75: Forecast conforming capital expenditure net of capital contributions: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Conforming capital expenditure	43.2	104.9	113.4	116.2	116.9	118.8	613.4
Less: Capital contributions	0.6	1.3	1.3	1.4	1.5	1.6	7.7
Conforming capital expenditure net of capital contributions to be added to the projected capital base.	**42.6**	**103.6**	**112.1**	**114.8**	**115.4**	**117.2**	**605.7**

9.4.2 Forecast Depreciation

Rule 89 sets out the requirements in relation to forecast depreciation. Rule 89(1) sets out the factors to be taken in to account when designing the schedule. This includes the need for the depreciation schedule to be designed so that reference tariffs will vary, over time in a way that promotes efficient growth in the market for reference services.

Rule 89(2) provides that designing the depreciation schedule so reference tariffs will vary, over time in a way that promotes efficient growth in the market for reference services may involve deferral of depreciation particularly in certain circumstances where the market is immature, the reference tariffs have been calculated on the assumption of significant market growth and the pipeline had been designed and constructed so as to accommodate future growth in demand.

Efficient growth in the market for reference services is promoted where reference tariffs are structured to signal efficient use of the service. In his report to ATCO Gas Australia on depreciation options[125], Gregory Houston observes:

> *In my opinion, efficient growth in the market for gas pipeline services will be promoted by tariffs that reflect – at each and every point in time – the marginal cost of providing the particular service in question. Such tariffs ensure that users are presented with a financial signal as to the resource cost of providing the service, thereby encouraging them to consume the service only when the benefit to them exceeds the cost of its provision. In economics, tariffs that reflect this principle are said to be 'allocatively efficient'.*

A further rule now relevant to the calculation of depreciation is rule 87(4), which requires the rate of return to be determined on a nominal vanilla basis. To date ATCO Gas Australia's rate of return has been determined on a real basis and applied to an indexed capital base, to which a depreciation allowance calculated on a straight line basis is applied. New rule 87(4) requires a change in approach to avoid double counting inflation, which would otherwise occur if a nominal return was applied to an indexed capital base.

ATCO Gas Australia considers the optimal application of the new rate of return framework within the context of the NGR is to only account for inflation in the rate of return and not to apply inflation to the capital base. This approach relies on the value of the capital base being recorded using the historical cost accounting method (HCA). The previous practice of applying inflation reflected a current cost accounting method (CCA).

The NGR does not require the application of inflation to the capital base. Indeed, the process for determining the opening and projected capital base under the NGR does not provide for the application of inflation. The potential for the application of inflation to the capital base is acknowledged in rule 89(1)(d). This rule contemplates, but does not require, that the application of inflation to the capital base can occur where the accounting method approved by the regulator permits.

(a) Consideration of depreciation methods

Features of the methods

ATCO Gas Australia considers two primary methods could be used to calculate depreciation:

[125] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, p.33.

- Historical cost accounting (HCA)
- Current cost accounting (CCA)

The HCA method would apply straight line depreciation to an unindexed capital base. This method is consistent with the depreciation method adopted by the majority of businesses participating in competitive markets. These businesses are able to choose an alternative method, but don't. It is also the depreciation method adopted by many firms subject to economic regulation in North America as well as to APA Group's Goldfields Gas Transmission pipeline in Western Australia.

The CCA method applies straight line depreciation to an indexed capital base. This is the approach previously adopted by ATCO Gas Australia and was accompanied by the determination of a real rate of return. However, the new rule 87(4), which requires the application of a nominal rate of return would result in an allowance for inflation being provided for twice – in the rate of return and the inflated capital base value. Therefore, the CCA approach could no longer be applied without some sort of adjustment to account for the double counting of inflation.

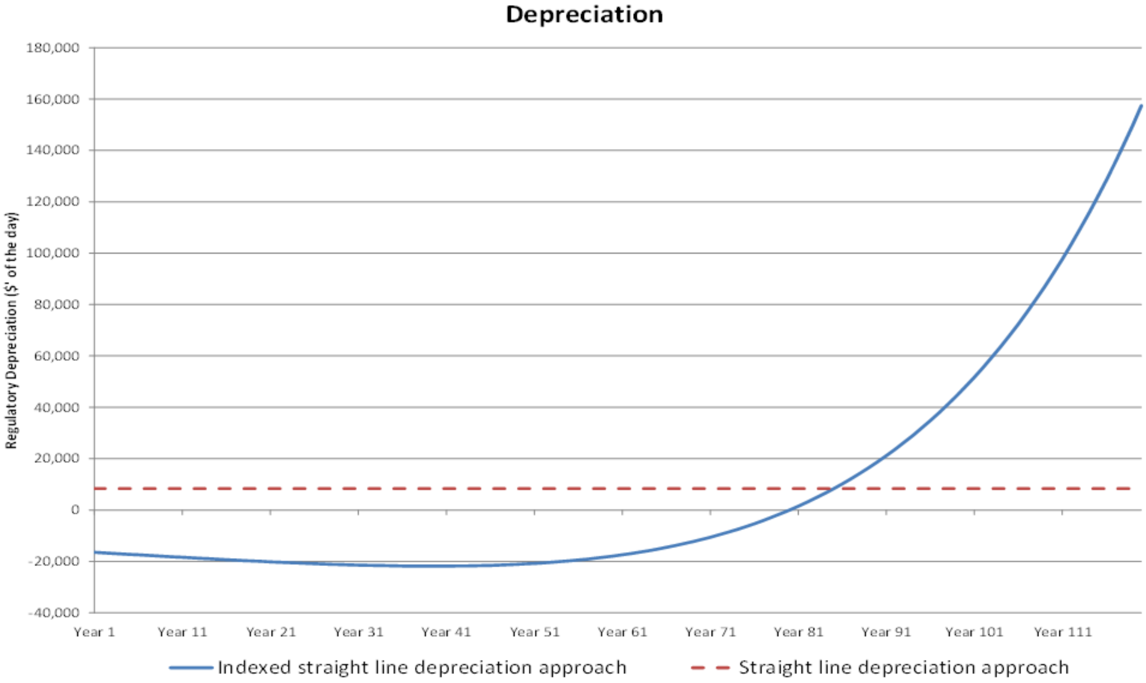
In its Post Tax Revenue Model (PTRM) methodology, the AER proposes such an adjustment. Under the PTRM, a nominal return is applied to the indexed capital base and then an amount representing the double counting of inflation is subtracted from the depreciation allowance. The effect of this approach is to defer the recovery of depreciation to later periods.

The PTRM approach seems permissible as rule 89(2) contemplates deferral of depreciation. It is noteworthy, however, that rule 89(2) refers to three scenarios in which such a deferral might be involved, which imply that the default position, absent any circumstances justifying a deferral, would be for the depreciation schedule to not include any such deferral. This is not surprising as such a deferral should obviously be approached with caution given the content of the National Gas Objective (NGO) and Revenue and Pricing Principles (RPPs). It is also clear from this sub-rule that the depreciation to which this rule is referring is depreciation in an accounting sense, as it is only in that sense that the notion of a deferral arises.

The following figure from the Nera Depreciation report illustrates the deferral of the recovery of depreciation under CCA with an adjustment for the double counting of inflation in Figure 2.1 of the report as presented in Figure 81 below. [126]

[126] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, Figure 2, p.4.

Figure 81: Depreciation under the HCA and CCA (with an adjustment for the double counting of inflation)



The ERA's Rate of Return Guidelines signals it will utilise the PTRM, or similar model. However, in its letter to the AEMC, the ERA identified that the AER's PTRM method does not deliver a nominal return as required under rule 87(4). The ERA stated:

> *The AER removes inflation on the opening value of the RAB from the forecast nominal value of real depreciation of the RAB. This inflation adjusted depreciation serves to deliver a return on and of the RAB within the model that is equivalent to a real approach.*[127]

ATCO Gas Australia agrees and considers the use of the PTRM is inconsistent with rule 87(4).

Of the two methods, ATCO Gas Australia considers the HCA method is simpler and better understood than CCA and is more widely used in competitive markets. The HCA approach also eliminates the need for a deduction for the double counting of inflation, which under the CCA method is an additional step that addresses a problem that does not need to be introduced.

Both methods comply with rule 89(1)(b). ATCO Gas Australia considers the HCA method better complies with rule 89 (1)(a) and removes the need to consider rule 89(2) as deferral of depreciation is not required.

Although the HCA approach results in a short term price impact, this is offset by lower prices in the longer term. If HCA is applied, the higher prices in the short term would result in ATCO Gas Australia receiving more revenue in the AA4 period than under a CCA approach. However, ATCO Gas Australia receives no more revenue in net present terms over the life of the capital base under either approach.

[127] Appendix 14: Submission on the Price and Revenue Regulation of Gas Services: Draft Rule Determination, Economic Regulation Authority, October 2012, p. 3.

Reasons for the application of CCA

To aid in the assessment of the depreciation methods, ATCO Gas Australia sought to understand the reasons for the application in Australia of inflation to the asset base in the first place, given it is not the standard in competitive markets of regulated industries around the world.

ATCO Gas Australia has been unable to determine definitive reasons why the capital base has been previously indexed. One view is that CCA was used initially for valuing state owned enterprises. ATCO Gas Australia sought advice regarding the use of indexation at the commencement of economic regulation. In his report Jeff Makholm comments,

> *Those state enterprises ultimately drew from public funds—not the capital markets—and it was reasonable to compute a "current" value of such assets to set a RAB for privatisation. The use of CCA allowed governments to strike a balance between, on one hand, maximising the sale price, and, on the other, avoiding short-term tariff shocks that would have adversely impacted consumers and, in political terms, undetermined support for privatisation. The difficulty, however, was that in the medium and long term tariffs would rise higher under CCA as the deferred revenue was recovered.*[128]

ATCO Gas Australia believes the use of CCA in regulation in Australia simply reflects this history and that the initial valuations have been "rolled over" according to capital additions and depreciation in subsequent reviews. It is also worth noting that the National Electricity Rules, unlike the NGR, require that the roll forward model include that the capital base be indexed.[129].

As a result of the change to rule 87(4), this approach needs to be reconsidered by ATCO Gas Australia with reference to the legal requirements of the regulatory framework.

Depreciation methods tested against the National Gas Law (NGL) and NGR

The depreciation methods are considered against the requirements of the National Gas Objective and Revenue and Pricing Principles (RPPs) under the National Gas Law and rule 89(1)(a) of the NGR.

Regulatory practice in Australia to date provides little guidance on the assessment of HCA or CCA in achieving the NGO, RPPs or complying with 89(1)(a) as regulators have not directly considered the contribution of an accounting methodology to efficiency. As Jeff Makholm outlines[130],

> *… in the Goldfields Final Access Arrangement of 2005, the regulator approved a switch to HCA;*[131] *but in the APA GasNet Final Decision of 2013, the AER directed the company to retain CCA.*[132] *What appears evident in these decisions is that a mixture of economic efficiency criteria is*

[128] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 6.

[129] Clause 6.5.1(e)(3) of the NER.

[130] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 22-23.

[131] Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, Economic Regulatory Authority, 17 May 2005, paragraph 315 (p. 70).

[132] APA GasNet Final Decision, Appendix D (Depreciation), March 2013.

> *being applied inappropriately to the choice between HCA and CCA. That is, that the choice of accounting method is not supported by accepted concepts of economic efficiency or the tools regulators use to promote it. In this context, and in the AEMC's recent rule changes, it would appear that a fundamental examination of these accounting issues is needed.*[133]

The discussion in these decisions did not engage on the accounting method and instead focussed on the consequential impact on the revenue profile of depreciation and appear to suggest that a flat revenue profile in the short term is more efficient than any other revenue profile, or the consideration of the revenue profile over the longer term. As highlighted in the Nera report when considering the AER's APA GasNet Australia decision[134],

> *The statement implies that (1) the change would have to produce a net decrease in current revenues to be efficient; and (2) even then, the impact on customers of bearing the partially countervailing increase in depreciation charges in the future is irrelevant to the consideration of benefits customers would expect to get from lower capital costs now. This latter conclusion would appear to be contradictory to the NPV=0 principle relied upon by regulators in delivering a decision (as referred to by the ERA in the earlier decision). Neither is a reasonable implication and both are inconsistent with expectations of usual practices of regulators. Regulators, in performing their functions acknowledge that both increases and decreases in costs and prices could be efficient <u>and</u> consider outcomes to customers over the long term. Regulators are required under law to consider the long-term impacts and consumers rely on this so that short term decisions do not put long term efficient service provision at risk.*

There is no support for the proposition that the deferral of depreciation that occurs under CCA promotes efficient consumption or investment decision beyond the use of long run marginal cost pricing. Indeed, the use of CCA (and the subsequent deferral of depreciation) could result in the inefficient shifting of consumption from future periods to the present promoting investment that may not have been supported if prices had included the full cost according to the accounting principles unregulated markets use, as outlined by Makholm,

> *Using basic accounting to try to shape consumer behaviour, rather than the prescribed and accepted regulatory and accounting tools, removes the objective anchor for regulated revenues. It turns the job of how to align consumer interests with fair investor returns—a basic role of regulation—into a subjective problem based on the unprovable assumption that flattened revenue recovery for past investment decisions promotes efficient growth in regulated markets. Competitive markets do not set their prices according to inflation-indexed capital values, and there is no support in the regulatory literature that economic efficiency is at all enhanced by compelling regulated companies to defer revenue collections to future captive customers.*[135]

In conclusion, and as Makholm observes in his summary,

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[133] See: AEMC 2012, Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper, 29 November 2012, Sydney.

[134] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 27-28.

[135] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 31.

> *The problems inherent in CCA are apparent in recent regulatory decisions, such as the GasNet decision in 2013 and the Goldfields decision in 2005.*[136] *In those decisions, the deferral of the payment of inflation into the future, via a "smoothed" revenue profile, appears to have become a regulatory goal in and of itself without an objective foundation in the principles of regulatory economics or any evidence that efficient operation or growth—or public welfare—is served by such revenue deferrals.*[137]

ATCO Gas Australia considers the HCA method is consistent with the NGO, the RPPs and rule 87(4) and 89. The main reasons for this are:

- It is more economically efficient
- It promotes efficient market growth

Economic efficiency

There is no economic literature to support the notion CCA and deferral of depreciation is more efficient. It is widely accepted that pricing structure and in particular marginal cost pricing, has the most direct effect on efficient consumption and use. These concepts are captured in the NGO and the RPPs. Marginal costs do not reflect the sunk costs associated with long term investments. Investment in pipelines is capital intensive and once invested cannot be redeployed except where the pipeline is sold. The accounting method and depreciation are tools to allocate the recovery of investments already undertaken so the challenge is to ensure that the allocation of the recovery of these costs over time does not distort efficient investment, consumption and use.

Ensuring today's customers make consumption choices based on today's costs is more efficient than customers in the future making choices about consumption on the basis of prices that include costs deferred from past periods. Prices and pricing design are the first and best solution to achieve efficient consumption and use of services.

The deferred recovery of depreciation could exacerbate the impact on prices where technology and appliance efficiency leads to lower demand. This would result in future customers paying a higher share of past investment costs. Customers who are captive to gas in the medium and long term (due to having made long term investments in gas appliances) will not be in a position to do anything about this potential upwards spiral.

Having established that pipelines are "transactions specific", in that in that they realise their value only in relation to a particular transaction and become less valuable (or lose their value entirely) if relegated to another use[138], Makholm observes that the "periodic charges for the use of independent pipelines reflect not the current value of the pipe but rather an *allocation* of the costs for supply decisions already made"[139].

[136] Access arrangement final decision, APA GasNet Australia (Operations) Pty Ltd, 2013-17, issued 2013; Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, issued by the Western Australia Economic Regulation Authority, 2005.

[137] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 6 p.7.

[138] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 13.

[139] Appendix 15: Report on the subject of Cost Accounting for Gas Pipelines, Dr Jeff Makholm, NERA, March 2014, p. 19.

He concludes:

> *Nothing about the basic accounting questions affects the ability of regulators to apply the standard tools to elicit productive or allocative efficiency for pipelines in place. Thus, the choice between HCA and CCA involves whether one or the other better informs efficient pipeline entry and the choice by consumers of whether and how to consume gas (i.e., which kind of gas equipment to install). For pipelines that serve without specific contractual commitments, HCA does a better job of reflecting the revenues that track the computations of the opportunity cost of capital providers—reflecting in revenues the inflation-related opportunity cost in the year it occurs. Deferring such opportunity costs simply creates intangible capital accounts that must be paid by captive consumers later.*
>
> *Regulators cannot conscript capital from those competitive markets as public authorities once did for publicly-owned infrastructure services—they must attract capital. Indeed, such was one of the key incentive-destroying aspects of pre-privatisation Australian economic activity, with its many publicly-owned pipelines and other utilities, that Hilmer sought to change. As such, investment efficiency reasonably deals with how those capital markets, with alternatives in which to place their funds, decide to devote capital to regulated companies, for what purpose, and at what cost.*
>
> *Inviting competitive capital markets to participate in providing gas pipeline services efficiently necessarily includes embracing the institutions and practices upon which those competitive markets rely. Those capital markets rely on longstanding definitions for accounting and related concepts (such as depreciation). Reflecting the contemporaneous nominal opportunity cost of capital, including the generally-accepted methods of depreciation accounting, is consistent with the expectations of those capital markets in the way they account for investments in the market. CCA accounting, with its deferral of the cost of inflation, is not.*

To the extent that the recovery of investment costs must be allocated, the goal is minimising the distortions in the price path when compared to the long run marginal cost. This is discussed further in the next section on promoting efficient market growth.

Promoting efficient market growth

Efficient growth in the market for reference services is best achieved where prices to customers are efficient. That is they reflect the long run marginal costs (LRMC) of providing the services. It follows then that the depreciation schedule that best promotes efficient growth in the market for reference services will be that which minimises the extent of departure from LRMC pricing caused by the need to recover sufficient revenues

As discussed above, the recovery of investment costs gives rise to the risk of distortion to efficient patterns of consumption and, in these circumstances,

> *..the depreciation schedule should be designed to minimise the gap between LRMC and the revenue per unit to be recovered over the life of the asset*.[140]

Applying this principle is an empirical task that requires an estimate of the future time profile of:

[140] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, p. 11.

- The LRMC of providing the reference service
- The revenue per unit associated with each depreciation methodology; and
- The difference between them.

Having assessed the long term price trends for the principal inputs used by ATCO Gas Australia for the provision of reference services, Houston expects the LRMC of the reference services provided by ATCO Gas Australia's distribution business to fall over time[141]. Houston presents an indicative LRMC curve[142].

Houston then considers the time paths of total revenue modelled by ATCO Gas Australia which vary according to whether or not they provide for the capital base to be indexed. The three priced paths modelled are:

- Indexed capital bases
- Non-indexed capital base
- Transitional approach

Houston then converts the total revenue calculated to total revenue per GJ in constant price terms for each scenario. He is then able to rank the three depreciation methods as follows:

> *On the basis of my analysis of the likely time profile of LRMC, and of ATCO's projections of anticipated revenue per unit, I am able to rank the three depreciation methods that JWS has asked me to consider as follows:*
>
> - *the use of a straight line depreciation approach together with an unindexed capital base would result in time profile of tariffs that best promotes efficient growth in the market for reference services;*
> - *ACTO Gas's proposed transition method would better promote growth in the market for reference services, as compared with an indexed straight line depreciation approach together with an indexed capital base; and*
> - *the indexed straight line depreciation approach together with an indexed capital base least promotes efficient growth in the market for gas distribution services.*[143]

The Houston independent expert report demonstrates that over the longer term, the HCA method delivers lower prices and prices which minimise the gap between LRMC and the revenue per unit and is therefore more likely to promote efficient growth.

[141] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, pp. 18-19.
[142] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, p 25.
[143] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, pp. 35-36.

The conclusion of Houston is that:

> *.. the use of a straight line depreciation approach together with an unindexed capital base would result in time profile of tariffs that best promotes efficient growth in the market for reference services.*[144]

and

> *the indexed straight line depreciation approach together with an indexed capital base least promotes efficient growth in the market for gas distribution services.* [145]

Further, a tariff profile that minimises the gap between LRMC and the revenue per unit to be recovered over the life of the asset is more consistent with rule 94. In addition, when assessing the impact of depreciation on promoting efficient market growth, the NGO requires the consideration of the longer term, not just the next access arrangement period.

(b) ATCO Gas Australia proposal

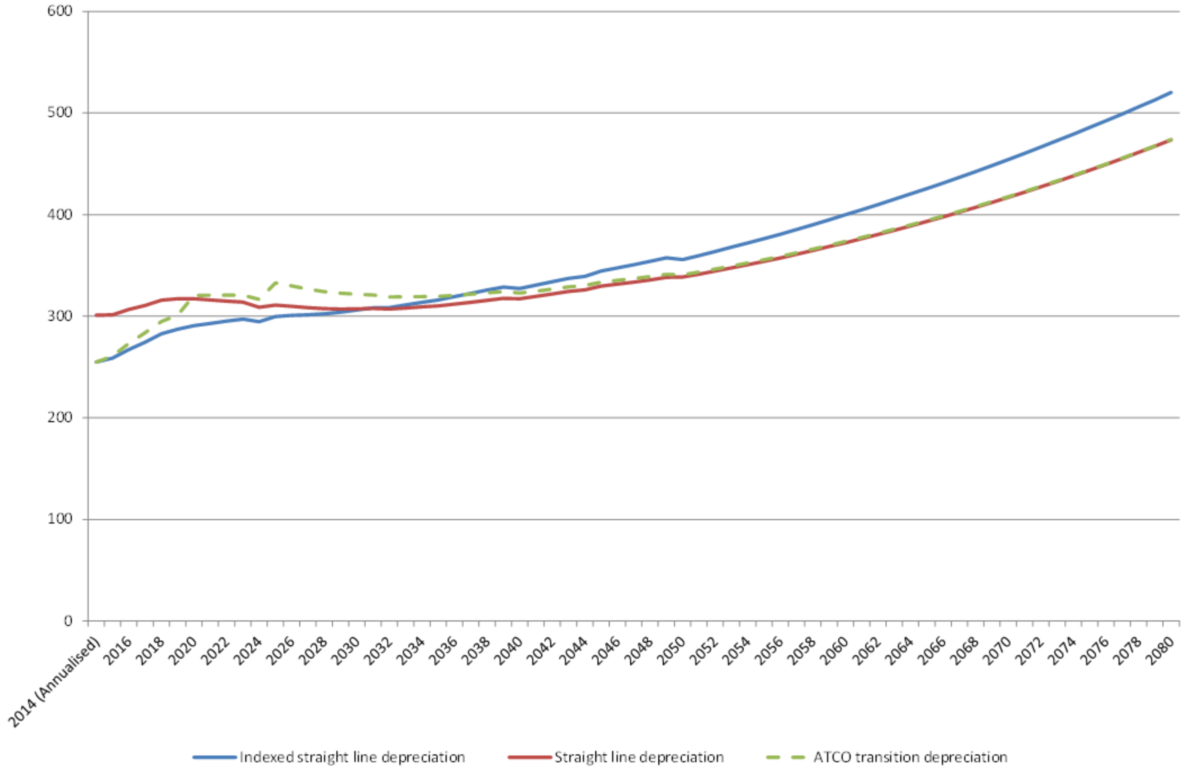
ATCO Gas Australia considers that it is no longer possible to index the RAB and comply with rule 87(4) unless some other adjustment is made to remove the double counting of inflation. The depreciation methodology that minimises the gap between LRMC and the revenue per unit, avoids double counting of inflation and reduces the costs to be recovered from customers in the future is to adopt the HCA, with a depreciation allowance calculated on a straight line basis.

However, the change in the methodology results in a short term price increase to customers. Therefore, ATCO Gas Australia proposes that the change to the methodology occurs over more than one access arrangement period. By fixing an end date for the transition, the longer term benefits will be delivered.

The following chart taken from the report from Gregory Houston[146] illustrates the revenue to be recovered per delivery point over 75 years for the indexed straight line approach, the non-indexed straight line approach and the transitional approach proposed by ATCO Gas Australia. Figure 82 below illustrates that the transitional approach reduces the revenue per delivery point in the short term compared to the straight line depreciation approach and reduces revenue per delivery point in the longer term than the indexed straight line depreciation approach.

[144] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, Figure 5.3, p. 36.
[145] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, p.36.
[146] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, Figure 5.3, p.30.

Figure 82: Comparison of depreciation methods: total revenue per delivery point ($)



The potential for higher prices in the short term when a nominal rate of return is applied was raised by the ERA in its submission to the AEMC's rule change process. In its submission to the AEMC's Draft Rule Determinations[147], the ERA outlined the price impact issue and indicated that:

> *… it would be a mistake to specify a 'nominal' post-tax rate of return for the NGR. The ERA considers that specification of a 'post-tax rate of return' for the NGR and for the NER, would be preferable.*[148]

In response to the ERA's concerns, the AEMC indicated there is insufficient evidence to conclude that allowing the flexibility of using approaches other than a nominal post-tax framework would necessarily lead to outcomes that better meet the NGO or the NEO[149]. Nevertheless, the AEMC recognised there may be transitional impacts that may need to be addressed. The AEMC considered the final rule provides sufficient flexibility for the regulator to consider the potential transitional issues either through the rate of return guidelines or at the time of individual access arrangement reviews and that this is preferred so that the regulator can address the individual circumstances.[150]

ATCO Gas Australia proposes a transition to the new method that recognises the depreciation allowance is directly related to the accounting treatment of the capital base and that the new rule 87 will first apply for the period commencing 1 July 2014. Therefore,

[147] Appendix 14: Submission on the Price and Revenue Regulation of Gas Services: Draft Rule Determination, Economic Regulation Authority, October 2012.

[148] Appendix 14: Submission on the Price and Revenue Regulation of Gas Services: Draft Rule Determination, Economic Regulation Authority, October 2012, p. 5.

[149] AEMC, Economic Regulation of Network Service Providers, and price and Revenue Regulation of Gas Services, August 2012 p.62.

[150] AEMC, Economic Regulation of Network Service Providers, and price and Revenue Regulation of Gas Services, August 2012 p.62-63.

the transitional proposal will apply HCA to all capital additions that occur from 1 July 2014 and progressively apply HCA to the past capital base over the next two regulatory periods.

The depreciation schedule for the AA4 period will be determined by applying:

- straight-line depreciation to the HCA value of all capital additions to occur during AA4 (from 1 July 2014); and
- straight-line depreciation to the CCA value of the opening capital base in any year of the period and subtracting an amount to remove the double counting of inflation.

In the next access arrangement period, the depreciation schedule will be determined by applying straight line depreciation to:

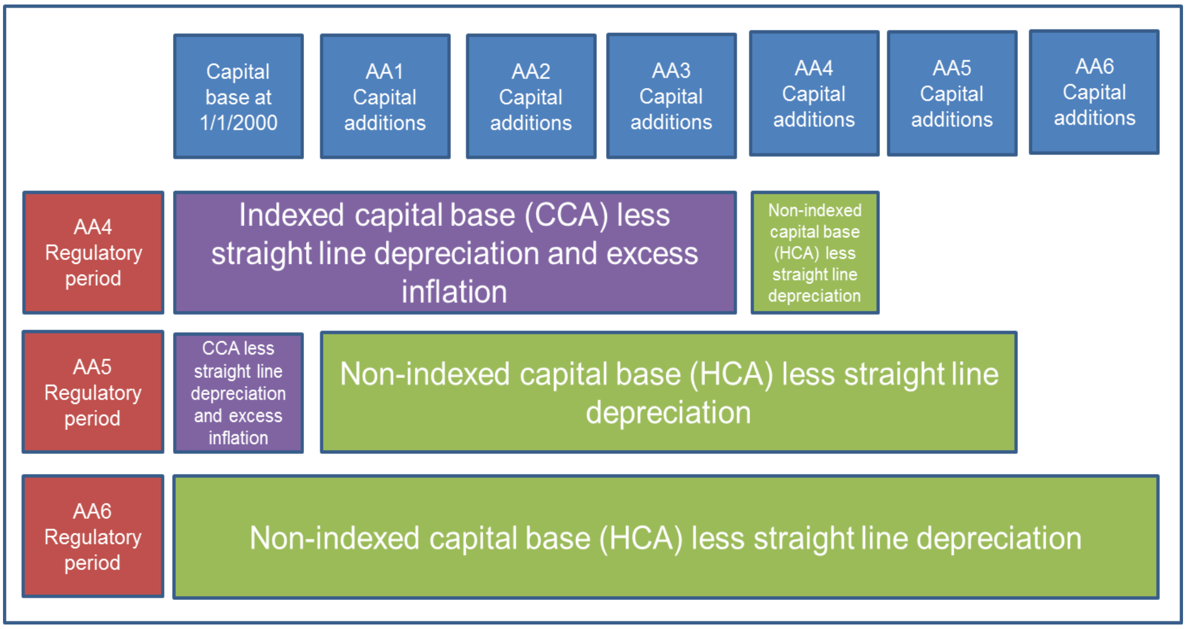
- the value of all capital additions that occurred between 1 January 2000 and 30 June 2014, indexed to 1 January 2020 but not thereafter;
- the CCA value of the opening capital base at 1 January 2000 and subtracting an amount to remove the double counting of inflation; and
- the HCA value of all capital additions that occurred in AA4 and to occur during the next period.

In all subsequent regulatory periods following the next regulatory period, the depreciation schedule will be determined by applying straight line depreciation to:

- the value of all capital additions that occurred between 1 January 2000 and 30 June 2014, indexed to 1 January 2020 but not thereafter;
- the CCA value in any year of the period of the opening capital base at 1 January 2000, indexed to 1 January 2025 but not thereafter; and
- the HCA value of all capital additions that occurred in in AA4 and following periods and to occur during subsequent periods.

The figure below illustrates the treatment of capital in subsequent regulatory periods.

Figure 83: Proposed approach to determining the projected capital base



The transitional proposal minimises the gap between LRMC and, the revenue per unit to be recovered over the life of the asset, is consistent with LRMC (NGO and RPPs) and therefore promotes efficient growth in the market for reference services.

ATCO Gas Australia has considered the average tariff profile under an indexed approach, an unindexed approach and the transition approach. That analysis concludes that ATCO Gas Australia's proposed transitional depreciation would better promote growth in the market for reference services, as compared with indexed straight line depreciation together with and indexed capital base.[151]

ATCO Gas Australia's proposed depreciation allowance meets the requirements of Rule 89(1)(a), therefore it must be accepted under the limited discretion rule. To the extent the ERA Guidelines suggests the use of the PTRM method (applying a nominal rate of return to the indexed capital base and then subtracting an amount representing the double counting of inflation), for the reasons set out in this chapter, the Guidelines should be departed from.

ATCO Gas Australia also proposes a fixed principle to give effect to the transition. This proposed fixed principle is outlined in Chapter 13 (Fixed principles).

Table 76 presents the calculation method and depreciation amount for AA4.

Table 76: Forecast depreciation calculation: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Forecast depreciation on opening capital base 1 July 2014 (straight line depreciation on CCA capital base less double counting of inflation)	4.8	12.4	12.6	12.4	11.9	10.7
Forecast depreciation on forecast capital expenditure (straight line depreciation on HCA capital)	-	2.1	5.9	9.6	13.2	17.5
Total	**4.8**	**14.4**	**18.5**	**22.0**	**25.1**	**28.1**

The following table presents the closing projected capital base at 31 December 2019.

Table 77: Closing capital base: 2010 to 2014

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Closing capital base	1,045.3	1,109.0	1,175.5	1,239.6	1,299.6	1,357.1

(c) Asset lives to be used for depreciation purposes

Rule 89(1)(c) provides that the depreciation schedule should be designed so as to allow, as for a as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset or group of assets. Currently high pressure pipelines, both steel and plastic, are assumed to have an economic life of 120 years. This is 40 years longer than the economic lives adopted for any asset class in other Australian gas distribution businesses.

ATCO Gas Australia proposes to address this anomaly in relation to the economic life assumed for high pressure pipelines and adopt economic lives for its high pressure steel and plastic pipelines that are more consistent with the economic lives adopted by other Australian gas distribution businesses – 80 years and 60 years respectively.

In its AA1 decision, the Office of Gas Regulation (OffGAR) recognised that the lives assumed for depreciation purpose for the ATCO Gas Australia network more likely reflected the technical life of assets rather than the economic life and accepted the proposed lives.

[151] Appendix 13: Depreciation Options for ATCO Gas, Gregory Houston, NERA, March 2014, Figure 5.3, p. 35.

No change to these lives was proposed in the second regulatory period however, the economic life of assets is affected by changing standards in asset management and safety requirements. Further, ATCO Gas Australia has reviewed the economic lives used by other gas distribution utilities. The economic lives assumed for ATCO Gas Australia are significantly out of step with other gas distribution businesses for high pressure steel mains. The variation has increased recently as a result of recent adjustments accepted by the AER.[152]

ATCO Gas Australia proposes that the life for all assets remains the same as that which was adopted in the third access arrangement period other than in relation to high pressure assets.

Table 78 presents the asset life to be used to calculate depreciation by asset class.

Table 78: Life used to calculate depreciation (years)

Asset class	Life used to calculate depreciation AA3	Life used to calculate depreciation AA4
High Pressure mains - steel	120	80
High Pressure mains - plastic	120	60
Medium pressure mains	60	60
Medium/low pressure mains	60	60
Low pressure mains	60	60
Regulators	40	40
Secondary gate stations	40	40
Buildings	40	40
Meters and service pipes	25	25
Equipment and vehicles	10	10
Vehicles	5	5
Information technology	5	5
Full retail contestability	5	5

These revised asset lives have been adopted in the forecast depreciation calculation for the AA4 period.

9.5 Depreciation to be used to roll forward the capital base

ATCO Gas Australia proposes that the depreciation method to be used for rolling forward the capital base from one period to the next is the depreciation forecast for the prior regulatory period as set out in Table 78.

[152] AER, Draft Decision for APT Allgas Access Arrangement for the QLD Gas Network (2011-2016) and AER Draft Decision for Envestra (QLD) Access Arrangement for the QLD Gas Network (2011-2016).

9.6 Forecast disposals

No disposals are forecast for the period 1 July 2014 to 31 January 2019

10. Rate of return

10.1 Key messages

- The determination of the rate of return must be in accordance with Rules 87(1) to 87(12), the national gas objective (NGO) and the revenue and pricing principles (RPP)

- The ERA's methodologies for estimating the rate of return set out in the Rate of Return Guidelines (the Guidelines) do not meet the requirements of the Rules. Their application would lead to error by the ERA. The Guidelines are not mandatory and ATCO Gas Australia's proposal departs from the Guidelines.

- The Guidelines do not present any evidence to suggest that gas distribution businesses have been de-risked over recent years, nor has there been any suggestion that the current beta estimate has resulted in over-investment.

- ATCO Gas Australia proposes a rate of return of 8.53%. This complies with the NGR, specifically the ARORO (allowed rate of return objective), the NGO and the RPP. It reflects the rate of return required to attract capital from private capital markets and the ATCO Group to undertake the required investment during the AA4 period

- ATCO Gas Australia has estimated the return on equity considering a number of relevant methods, models and data, resulting in an estimate of 10.70%

- ATCO Gas Australia has applied an on the day approach for estimating the cost of debt, using the 10 year Reserve Bank of Australia (RBA) corporate credit spread data and allowances for debt raising and hedging costs. This results in a cost of debt estimate of 7.09%.

- ATCO Gas Australia's proposed rate of return has been estimated differently to that outlined in the ERA's Rate of Return Guidelines. The difference in approach is required to comply with the NGR and to achieve the ARORO because:

  - With regard to the return on equity, the approach in the Guidelines does not consider *all* relevant methods, models, data and other evidence and instead relies only on the SL CAPM. In addition, in applying the chosen model the Guidelines do not use the best estimate of the relevant parameters. Further, the Guidelines do not effectively consider the resulting return on equity against the ARORO, the NGO or the RPP

  - With regard to the return on debt, the approach in the Guidelines does not estimate the cost of debt of a benchmark efficient entity and does not have regard to new relevant information published by the Reserve Bank of Australia (RBA). The approach outlined in the Guidelines incorrectly adopts a term of debt of five years and would introduce additional inefficient risks if an annual update was applied. The Guidelines approach does not produce a cost of debt estimate that meets the ARORO, the NGO and RPP

10.2 National Gas Rules requirements

The NGO as set out in the National Gas Law (NGL) is to:

> *promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with*

respect to price, quality, safety, reliability and security of supply of natural gas.

The RPP provide guidance on how the NGO is to be achieved. The most relevant principles to the rate of return are set out below.

(2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in—

(a) providing reference services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment.

(3) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes—

(a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and

(b) the efficient provision of pipeline services; and

(c) the efficient use of the pipeline.

(5) A reference tariff should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service to which that tariff relates.

Rule 87 of the National Gas Rules (NGR) governs determination of the rate of return to be used in setting the total revenue and reference tariffs for regulated gas network service providers. Rule 87 provides for the following:

Rate of return

(1) Subject to rule 82(3), the return on the projected capital base for each regulatory year of the access arrangement period is to be calculated by applying a rate of return that is determined in accordance with this rule 87 (the allowed rate of return).

(2) The allowed rate of return is to be determined such that it achieves the allowed rate of return objective.

(3) The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services (the allowed rate of return objective).

(4) Subject to subrule (2), the allowed rate of return for a regulatory year is to be:

(a) a weighted average of the return on equity for the access arrangement period in which that regulatory year occurs (as estimated under subrule (6)) and the return on debt for that regulatory year (as estimated under subrule (8)); and

(b) determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in rule 87A.

(5) In determining the allowed rate of return, regard must be had to:

(a) relevant estimation methods, financial models, market data and other evidence;

(b) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

(c) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

Return on equity

(6) The return on equity for an access arrangement period is to be estimated such that it contributes to the achievement of the allowed rate of return objective.

(7) In estimating the return on equity under subrule (6), regard must be had to the prevailing conditions in the market for equity funds.

Return on debt

(8) The return on debt for a regulatory year is to be estimated such that it contributes to the achievement of the allowed rate of return objective.

(9) The return on debt may be estimated using a methodology which results in either:

(a) the return on debt for each regulatory year in the access arrangement period being the same; or

(b) the return on debt (and consequently the allowed rate of return) being, or potentially being, different for different regulatory years in the access arrangement period.

(10) Subject to subrule (8), the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:

(a) the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the time when the ERA's decision on the access arrangement for that access arrangement period is made;

(b) the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the access arrangement period; or

(c) some combination of the returns referred to in subrules (a) and (b).

(11) In estimating the return on debt under subrule (8), regard must be had to the following factors:

(a) the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective;

(b) the interrelationship between the return on equity and the return on debt;

(c) the incentives that the return on debt may provide in relation to capital expenditure over the access arrangement period, including as to the timing of any capital expenditure; and

(d) any impacts (including in relation to the costs of servicing debt across access arrangement periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one access arrangement period to the next.

(12) If the return on debt is to be estimated using a methodology of the type referred to in subrule (9)(b) then a resulting change to the service provider's total revenue must be effected through the automatic application of a formula that is specified in the decision on the access arrangement for that access arrangement period.

Rate of Return Guidelines

(13) The ERA must, in accordance with the rate of return consultative procedure, make and publish guidelines (the rate of return guidelines).

(14) The rate of return guidelines must set out:

(a) the methodologies that the ERA proposes to use in estimating the allowed rate of return, including how those methodologies are proposed to result in the determination of a return on equity and a return on debt in a way that is consistent with the allowed rate of return objective; and

(b) the estimation methods, financial models, market data and other evidence the ERA proposes to take into account in estimating the return on equity, the return on debt and the value of imputation credits referred to in rule 87A.

There must be *rate of return guidelines* in force at all times after the date on which the ERA first publishes the *rate of return guidelines* under these rules. Rules 87(16) to (18) provide for the review and amendment of the Guidelines

Pursuant to rule 87(18) the *rate of return guidelines* are not mandatory (and so do not bind the ERA or anyone else) but, if the ERA makes a *decision* in relation to the rate of return (including in an access arrangement draft *decision* or an access arrangement final *decision*) that is not in accordance with them, the ERA must state, in its reasons for the *decision*, the reasons for departing from the guidelines.

10.3 Overview of changes to rule 87 of the NGR

10.3.1 NGO and RPP

The overarching requirements of the NGO and the RPP set out in the NGL are relevant to the determination of the rate of return. The new rate of return framework addressed below has been designed to give primary to achieving these objectives.

10.3.2 Rate of return

Significant changes to rule 87 came into effect on 29 November 2012.[153] The amendments followed a detailed review by the AEMC of the objectives in setting the rate of return. At the request of the Australian Energy Regulator (AER) and the Energy Users Rule change Committee the AEMC considered the effectiveness of the previous rate of return framework in achieving the overall objective (in the old rule 87(1)), the national gas objective (NGO) and the revenue and pricing principles (RPP).

The AEMC formed the view that while the previous structure of rule 87 provided considerable discretion and flexibility and was intended to focus on obtaining a good overall estimate of the rate of return, the flexibility in the framework did not appear to have been taken advantage of in practice. The AEMC was concerned with the formulaic approach that had developed and the interpretation of the rule by the Tribunal:

> *Moreover, recent decisions of the Tribunal have interpreted the NGR rate of return framework to apply in such a way as to reduce the range of information that can be used in estimating the rate of return. Such application could lead to the adoption of relatively formulaic approaches to*

[153] AEMC Rule Determination, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012, 29 November 2012 (**AEMC Rule Determination**).

> *determining the rate of return rather than focusing on the overall estimate.*[154]

The AEMC formed the view that given the interpretation and application of the previous rule 87, without amendment, the rules would not likely deliver outcomes that best meet the NGO and the RPP and that a new rate of return framework was needed. Accordingly, the amended rule 87 reflects a significant shift in the approach to setting the required rate of return.

The key features of rule 87 are summarised below.

10.3.3 Allowed rate of return objective

Under rule 87(2) the allowed rate of return is required to be determined such that it achieves the ARORO. Rule 87(4) sets out the form of the allowed rate of return. The sub rule states that subject to the allowed rate of return achieving the ARORO, it is required to be a weighted average of the return on equity and return on debt and is to be determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits. This has the effect of requiring a post-tax nominal approach to total revenue determination. This requires a change in approach for ATCO Gas Australia given the rate of return in the current access arrangement is calculated on a real pre-tax basis.

In making the rule changes the AEMC noted the primary objective of the allowed rate of return is to provide service providers with a return on capital that reflects efficient financing costs, allowing the service provider to attract the necessary investment capital to maintain a reliable energy supply while minimising the cost to consumers. The AEMC highlighted that there was a need to bring the focus of the rate of return estimate in the rules back to the NGO and the RPP, and therefore included the ARORO:

> *In order to meet the NEO and the NGO, this objective reflected the need for the rate of return to "correspond to" the efficient financing costs of a benchmark efficient entity being one with similar circumstances and degree of risk to the service provider.*[155]

10.3.4 Having regard to relevant estimation methods, models, market data and evidence

One of the most significant additions to the rate of return framework is rule 87(5). The new sub rule requires that in determining the allowed rate of return, regard must be had to relevant estimation methods, financial models, market data and other evidence.

The AEMC's basis for inclusion of this sub rule was that achieving the ARORO, the NGO and the RPP requires the best possible estimate of the benchmark efficient financing costs. This can only be achieved when the estimation process is of the highest quality.

The AEMC stated that:

> *Achieving the NEO, the NGO, and the RPP requires the best possible estimate of the benchmark efficient financing costs. The Commission stated that this can only be achieved when the estimation process is of the highest possible quality. The draft rule determination stated that this meant that a range of estimation methods, financial models, market data and other evidence must be considered. At the same time, the regulator requires*

[154] AEMC Rule Determination, page 41.

[155] AEMC Rule Determination, page 43. The final drafting of the ARORO requires the rate of return to be commensurate with efficient financing costs (rule 87(3)).

> *discretion to give appropriate weight to all the evidence and analytical techniques considered.*[156]

The AEMC noted the application and interpretation of the previous Rule 87 (including the use of the Sharpe Lintner CAPM alone to determine the cost of equity)

> *presupposes the ability of a single model, by itself, to achieve all that is required by the objective. The Commission is of the view that any relevant evidence on estimation methods, including that from a range of financial models, should be considered to determine whether the overall rate of return objective is satisfied.*[157]

The Commission concluded no one method can be relied upon in isolation to estimate an allowed return on capital that best reflects benchmark efficient financing costs.[158]

10.3.5 Specific cost of equity and cost of debt rules

Importantly, rule 87(6) requires the cost of equity be estimated such that it contributes to the achievement of the ARORO.

Regard must also be had to prevailing conditions in the market for equity funds (87(7)). The AEMC noted this reflects the importance of estimating a return on equity that is sufficient to allow efficient investment in, and efficient use of, the relevant services.[159]

Specific principles for the return on debt are set out in rule 87(8) through to 87(12) which also state the return on debt must be estimated such that it contributes to achievement of the ARORO.

Specific considerations for the design of the cost of debt methodology are prescribed in rule 87(10). Rule 87(11) also sets out a list of considerations that must be regarded in estimating the cost of debt. The application of these rules is set out in more detail in the cost of debt section of this chapter.

10.3.6 Application of the new rate of return framework

As set out above, it is necessary for the ERA to have regard to *all* relevant estimation methods, models, market data and evidence when it comes to estimating the allowed rate of return. To do otherwise will not produce the best estimate of the rate of return that achieves the ARORO, the NGO and RPP.

The new rules have been designed so as to require consideration of more models, methods and evidence in order to produce a better quality estimate than has been the case in previous regulatory decisions, particularly in relation to the cost of equity where a formulaic approach using the SL CAPM had emerged.

As can be seen from the above extracts of the AEMC's rule determination, the AEMC specifically recognised and acted upon the need to move away from formulaic approach to the estimate of the rate of return. The AEMC recognised the need to have balance between ensuring that the regulator has regard to all relevant estimation models, methods

[156] AEMC Rule Determination, page 43.
[157] AEMC Rule Determination, page 48.
[158] AEMC Rule Determination, page 49.
[159] AEMC Rule Determination, page 69.

and evidence, with the need to allow flexibility as to what that consideration would include.[160]

ATCO Gas Australia's specific submissions on the application of these new rules in estimating the cost of equity and the cost of debt are set out in more detail later in this chapter and in the accompanying expert reports of SFG: *Estimating the required return on equity,* March 2014 and CEG: *Cost of debt consistent with the NGR and NGL*, March 2014.

10.3.7 Rate of Return Guidelines

The ERA published its Guidelines in December 2013. Pursuant to Rule 87(18), the Guidelines are not mandatory. If the ERA makes a decision in relation to the rate of return that is not in accordance with the Guidelines, the ERA must state the reasons for departing from it.

ATCO Gas Australia has found that to follow the Guidelines would result in an overall rate of return that does not meet the requirements of rule 87 and does not give rise to a rate of return that achieves the ARORO, the NGO or the RPP. The reasons for this are set out in the expert evidence provided by SFG and CEG.

Contrary to the requirements of Rule 87(14), the Guidelines do not purport to indicate how the methodologies proposed will result in the determination of a return on equity and a return on debt in a way that is consistent with the ARORO. ATCO Gas Australia submits the methodologies are not consistent with the ARORO.

The approach in the Guidelines for the return on equity does not consider *all* relevant methods, models, data and other evidence and instead relies only on the SL CAPM. In applying the chosen model, the Guidelines do not use the best estimate of the relevant parameters. The Guidelines also do not provide effective consideration of the estimate of the return on equity and debt against the ARORO, the NGO or the RPP.

With regard to the return on debt, the Guidelines do not estimate the cost of a debt financing strategy which can be implemented by a benchmark efficient entity. Further, the Guidelines have not had regard to new information published by the RBA. The adoption of a five year term for debt does not provide an opportunity to recover efficient costs and an annual update to the debt risk premium would introduce additional risks. Overall, the cost of debt approach does not give rise to the best estimate and does not produce an estimate that achieves the ARORO, the NGO or the RPP.

For these reasons, ATCO Gas Australia's proposed approaches for estimating the return on equity and debt depart from the Guidelines. The Guidelines are not mandatory and there is no threshold test that must be met before the Guidelines are departed from. The Guidelines fall away if they do not produce a rate of return which meets the requirements of the Rules. For the reasons stated in this submission the ERA's Guidelines are contrary to Rule 87 and their application would lead to error by the ERA[161].

ATCO Gas Australia's proposals are supported by reports from independent experts which demonstrate that it's proposed approach to the cost of equity and cost of debt meet the requirements of Rule 87, the ARORO and the NGO and RPP.

[160] AEMC Rule Determination, page 57.

[161]Appendix 34: Rate of Return guidelines, Meeting the Requirements of the National Gas Rules, ATCO Gas Australia, March 2014 .

10.4 Estimating the required return

Like any other business, network service providers require capital to invest in their business. These funds are provided by the owners (through equity) or lenders (through debt). Both the owners and lenders require a return on the funds they provide. The sum of the return required by equity and debt investors, weighted by the proportions of equity and debt used by the business is referred to as the weighted average cost of capital (WACC) or rate of return.

Estimating the WACC for a regulated business is a critical step in any regulatory determination. This decision has a major influence on the prices the business can charge for its regulated services over the regulatory period and on its incentives to invest in the assets it uses to provide these services.

If the WACC is set too low, it could result in prices that are below efficient costs encouraging users to consume more than is efficient and discourage efficient investment. Inefficiently low investment can affect safety and service levels as well as the ability to properly provide for growing demand.

If the WACC is set too high users may use less than an efficient amount and pay more than the efficient costs. Further, if a higher rate of return is expected to continue over future periods then inefficiently high levels of investment may also occur.

There are many checks in the regulatory framework and private capital markets to discourage and detect inefficiently high levels of investment. However, there are very few checks for inefficiently low investment. Detecting inefficiently low levels of investment is also complicated by requirements to invest in safety and comply with technical regulations, which means that the implications of insufficient investment will not manifest for a number of years.

As a result, the consequences to customers of inefficiently high levels of investment are likely to be identified more readily and addressed more effectively than the implications of inefficiently low levels of investment driven by a low WACC. Therefore, it is in the interest of the regulated service provider and its customers that the WACC must be set to attract capital and undertake efficient investment, consistent with the NGO and the RPP.

The NGR provides significant guidance on how the rate of return is to be estimated. The rate of return is estimated as a weighted average of the cost of equity (re) and cost of debt capital (rd).[162] The respective weights applicable to equity and debt are market value weights. Allowances for corporate taxes, including tax benefits of imputation tax credits, are accounted for outside the WACC.[163] The regulated rate of return is set according to the equation below, and is identified in the NGR as a nominal vanilla rate of return (or WACC) in which E/V and D/V represent the respective market value proportions of equity and debt capital and V = D + E:

$$WACC = r_e \frac{E}{V} + r_d \frac{D}{V}$$

The above equation requires an estimate of the cost of equity, the cost of debt and gearing. The estimate for the cost of equity is presented in Section 10.7. The estimate for the cost of debt is presented in Section 10.9 and gearing is assumed to be 60%, consistent with assumptions in AA3 and the Guidelines.

[162] NGR 87(4).

[163] NGR 87A.

The tax benefits of imputation credits are accounted for separately via the parameter gamma (γ) which represents an estimate of the market value of a dollar of corporate tax. In turn, there has been a convention established in Australian regulatory practice[164] to estimate gamma as the product of a distribution rate (F) and the value of a distributed credit (theta or θ). The distribution rate is an estimate of the proportion of tax credits distributed by a benchmark firm, relative to the tax credits created via the payment of corporate tax. ATCO Gas Australia has adopted this approach which is consistent with the Rate of Return Guidelines. The equation for gamma is as follows:

$$\gamma = F \times \theta$$

10.5 Averaging period for market-based parameters

ATCO Gas Australia will lodge a separate and confidential request with the ERA to agree, prior to the final decision, the averaging period for market based parameters that will be adopted for the purpose of the ERA's Final Decision. This averaging period will be in respect of the calculation of the return on debt and the parameters used to populate the relevant cost of equity models, which are used to derive the cost of equity proposal. It is expected that this date will remain confidential until the ERA delivers its Final Decision. This approach is consistent with the ERA's recent access arrangement determinations and the process followed in establishing the estimate for AA3.

For the purpose of calculating the return on equity for this submission, ATCO Gas Australia has adopted a 20 business day averaging period commencing on 22 October 2013 and ending on 18 November 2013. ATCO Gas Australia has adopted an averaging period of 20 days for practical reasons given the short amount of time between the publishing of the Guidelines and the submission date. ATCO Gas Australia considers the adoption of a 20 day period or the 40 day period immaterial to the outcome of the approach and as noted previously, the averaging period will be re-set closer to the ERA's Final Decision.

10.6 ATCO context

ATCO Gas Australia is a privately-owned subsidiary of Canadian Utilities Limited – a diversified group of companies principally controlled by ATCO Ltd. Like most privately owned companies ATCO Gas Australia must compete for capital out in the capital market. However, ATCO Gas Australia must also compete against the other businesses within the ATCO group of companies for capital, many of which are also regulated utilities.

ATCO purchased WAGN with the intent to grow the network and offer West Australian consumers greater choice and competition in their energy supply. ATCO Gas Australia also has considerable responsibilities in ensuring safety risks are as low as reasonably practicable and technical standards are complied with. In order to facilitate this outcome it will be necessary for the business to attract sufficient capital over the AA4 period to fund the planned investment in and maintenance of the network. To attract capital to invest in the Network, ATCO Gas Australia requires a rate of return consistent with the ARORO. ATCO Gas Australia considers that such a return would be consistent with the following:

- The assessment made by ATCO Gas Australia of the regulatory framework, the return on equity at the time of purchase and prior periods and an assessment of likely future estimates of the return on equity. This assessment was based on a range of information and expectations similar to the approach now enshrined in rule 87

[164] Application by Energex Limited (Gamma) (No 5) [2011].

- Future prospects in other businesses in the ATCO group of companies so that ATCO Gas Australia can attract capital from its investors
- Expectations about stable returns of investors in long life assets

However, if the approach outlined in the Guidelines were adopted this would not be consistent with the ARORO because the approach:

- Does not comply with the new rate of return framework in rule 87, the ARORO, the NGO or the RPP
- Is considerably lower than that which existed at the time of purchase and any reasonable expectations about the future based on past decisions, market observations as well as forecast model estimates. ATCO Gas Australia has not observed a corresponding reduction in the degree of risk associated with the provision of reference services over this period
- Is considerably lower than that proposed for ATCO Gas (Canada), a gas distribution network in the recent filing with the Alberta Utilities Commission of a return on equity of 11.25%[165]. This estimate represents the return for a gas distributor operating within a very similar incentive based regulation framework to that of ATCO Gas Australia
- Signals a significant drop in the return on equity with no observable drop in risk or expectations of investors about the return on equity. A drop in the risk free rate has not flowed through to the return on equity in Canada[166] or Australia[167].
- Is lower than the return on equity foreshadowed by regulators in other Australian jurisdictions. It is not clear why an investment in a gas distribution network in Western Australia, applying over the same period, would derive less value than those elsewhere in Australia
- Introduces expectations of instability over the life of assets affecting investment decisions today and outcomes to customers in the future. This is the result of adopting a single theory and model not widely subscribed to, that a rise or fall in the risk free rate corresponds directly to a rise or fall in the required return on equity

Safety and system integrity are very important to ATCO. ATCO Gas Australia will always invest to ensure the safety of its customers, employees and the community. Therefore, continued investment in this area is not adequate evidence that the return is sufficient. An insufficient rate of return on investment will dampen investment required to support economic and population growth. The impact of limited investment in growing the network is higher capital contributions from customers, connection delays and higher prices in the absence of new connections sharing costs. These impacts are not visible in the short term.

10.7 Cost of equity

The cost of equity is the return required by investors to compensate them for investing in the business. This return comprises a risk premium above the nominal risk free rate.

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[165] Appendix 16: Testimony on the cost of capital for Alberta utilities, Foster Associates, January 2013.

[166] Appendix 17: Guidelines for rate of return for Gas Transmission and Gas Distribution, letter from Brian Bale ATCO February 2013.

[167] Appendix 18: Estimating expected return on the market in the context of recent regulatory debate, CEG, June 2013.

In accordance with rule 87, ATCO Gas Australia has arrived at its estimate for the return on equity after considering a wide range of relevant methods, models, market data and other information. This approach uses relevant information in an objective, transparent manner in order to estimate the return on equity that has regard to the prevailing conditions in the market and achieves the ARORO. ATCO Gas Australia's approach represents a fresh appraisal of all relevant estimation methods, financial models, market data and other evidence and is similar to the multi-model approach advocated by businesses and the Energy Networks Association (ENA) in their submissions relating to the Rate of Return Guidelines for both the ERA and AER[168].

10.7.1 Rate of Return Guidelines approach

ATCO Gas Australia considered applying the approach in the Rate of Return Guidelines. However, this approach to estimating the required return on equity relies solely on the Sharpe-Lintner CAPM and the following parameters:

- An estimate of the risk-free rate set to the contemporaneous yield on five year Commonwealth Government bonds
- An estimate of equity beta determined from regression analysis applied to a small sample of domestic firms
- An estimate of the market risk premium set to 6%

This approach does not result in an estimate of a return on equity that achieves the ARORO or complies with the rules because:

- The approach excludes other relevant estimation methods and models
- The estimates of parameters used in the SL CAPM are not the best estimates
- The process results in all other relevant information having no effective influence on the estimate and the estimate is not considered against the ARORO
- The resulting estimate does not achieve the ARORO and is not sufficient to allow ATCO Gas Australia to attract funds from capital markets, within the ATCO Group or from like businesses in other states

As noted above, as a consequence of the above points ATCO Gas Australia considers that application of the Guidelines will lead to error so its rate of return proposal departs from the Guidelines[169].

To see how the ERA has reached the conclusion that only the SL CAPM is relevant, it is helpful to work through the five step process set out in figure 84, which outlines the proposed approach for estimating the return on equity in the ERA's Guidelines. The ERA considers these five steps will enable the consideration of a wide range of material, relevant models and a range of other relevant information[170]. The ERA says it will weight each piece of information according to its merits at the time of the access arrangement determination.

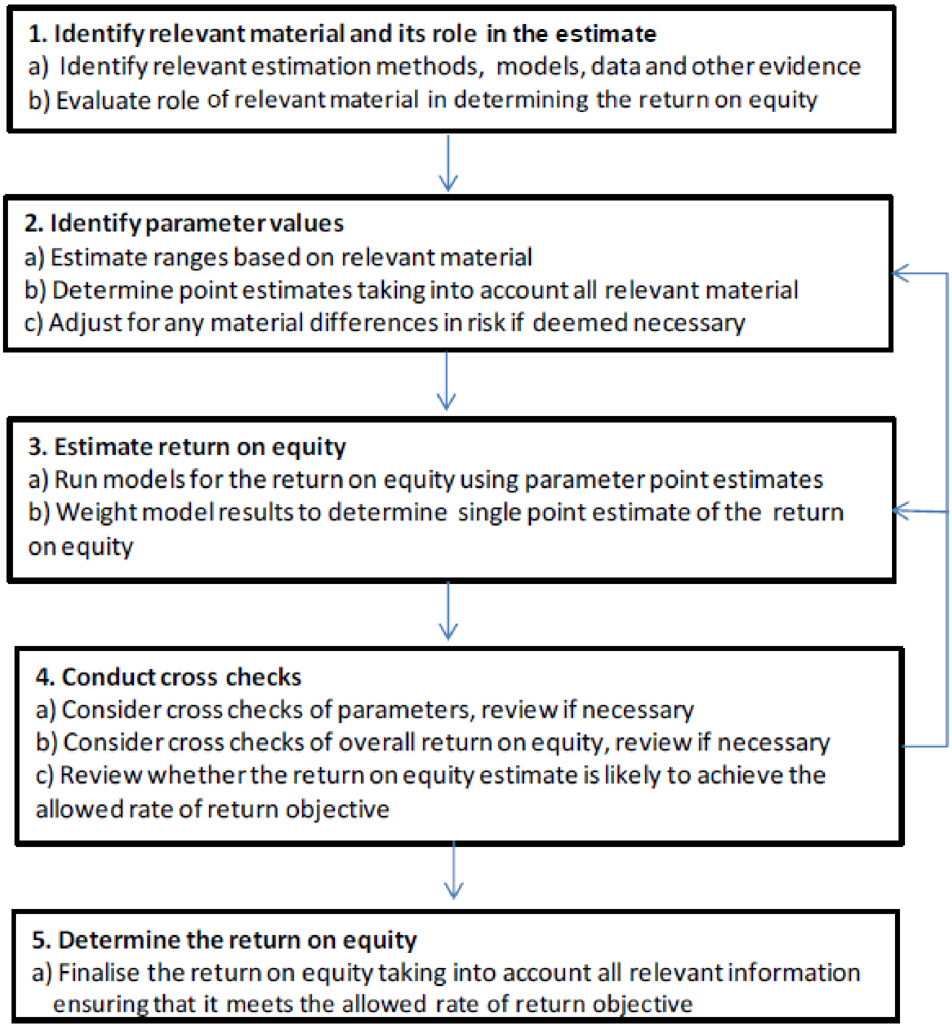
[168] ENA 28 June 2013, Response to AER Rate of Return Guideline Consultation Paper and ENA October 2013, Response to the Draft Rate of Return Guideline of the Australian Energy Regulator. Available from: www.erawa.com.au.

[169] ATCO Gas Australia refers to and relies on the letter to the ERA submitted with this proposal dated 17 March 2014 in respect of the application of the Guidelines.

[170] ERA Rate of Return Guidelines, para. 120.

The ERA states this process will enable it to provide a transparent and clear decision that meets the ARORO[171].

Figure 84: Guidelines approach to estimating the return on equity[172]



Step 1 Identify relevant material and its role in the estimate

In the first step of the return on equity estimate process in the Guidelines, relevant estimation methods, models, data and other evidence are said to be identified and considered consistent with rule 87(5). This step also involves an evaluation of the role of the deemed relevant material in determining the return on equity. At this step the Guideline identifies that the SL CAPM is the only relevant model for estimating the required return on equity.

The Guideline presents a set of criteria that it uses to determine which information it considers to be relevant. These criteria are set out in paragraphs 36 to 37 of the Guidelines and are said to have been developed in order to

> *…allow the Authority to articulate its interpretation of these requirements set out in the NGL and NGR*[173]

[171] ERA Rate of Return Guidelines, para. 120.

[172] ERA Rate of Return Guidelines, Figure 1.

In Appendix 8 to its Explanatory Statement, the ERA states that the SL CAPM is the only model that meets the criteria for inclusion as relevant evidence for the purpose of estimating the required return on equity:

> *In summary, the Authority considers that the Sharpe Lintner CAPM remains a key tool for evaluating the return on equity. The model aligns with theory. It is also the most empirically stable model of the return on equity within an Australian context. Together, these outcomes lead the Authority to consider that the Sharpe Lintner CAPM is fit for purpose. On this basis, the Authority judges that the Sharpe Lintner CAPM model is relevant in terms of estimating the return on equity for the purposes of meeting the allowed rate of return objective.*[174]

In the same Appendix, the ERA evaluates other models for the return on equity against the criteria set out in the Guidelines and finds that, at this time, the Sharpe Lintner CAPM is the only relevant model that should be considered in estimating the return on equity. Therefore, the ERA has not considered return on equity estimates derived from other cost of equity models such as the Fama-French Model. The Guidelines identify that the dividend growth model will be used to estimate expected returns on the market but will not use any information from this model to estimate the risk exposure of the benchmark firm.

ATCO Gas Australia considers there are other estimation methods and models that are relevant in estimating the return on equity. The criteria identified in the Guidelines do not appear in the rules and are therefore subservient to the National Gas Law, National Gas Objective, NGR and ARORO. The NGR requires that all relevant estimation methods, models, data and evidence must be considered if relevant to the estimation of the rate of return (comprised of the cost of equity and the cost of debt). It seems unlikely that the best way of estimating required return on equity would be to have no regard at all to leading models for estimating the required return on equity. As demonstrated in the introduction to this chapter, this approach is inconsistent with the intention of the changes to the rate of return framework.

The attached report from SFG provides analysis of the ERA approach in the Guidelines and the relevant estimation methods, models and market data, as required by the NGR. This analysis demonstrates that:

- The ERA's criteria represent an incorrect assessment of what methods, models, data and other evidence should be regarded in estimating the cost of equity. The requirement is to have regard to all relevant methods, models, market data and other evidence[175]
- Even if the ERA's criteria is valid, it has not been applied consistently in the assessment of return on equity models[176]
- The SL CAPM is unlikely to meet several of the criteria if the same standard of assessment is applied across all models[177]
- The Fama-French model generally satisfies the criteria at least as well as the SL CAPM and should therefore be considered relevant information[178]

[173] ERA Rate of Return Guidelines, para. 36.

[174] ERA Explanatory Statement for the Rate of Return Guidelines Appendix 8, p.63, para. 33.

[175] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.

[176] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014 para. 70-146.

[177] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 114-121.

- The reasons for dismissing the dividend growth model (DGM) are inconsistent with contemporary studies and inconsistent with the Guidelines' acceptance of the DGM approach for the purposes of estimating the market risk premium estimate[179]
- The estimate of the average firm is relevant, particularly as a comparator for the required return on equity for the benchmark efficient firm[180]
- The Guidelines come to the incorrect conclusion that only the SL CAPM is relevant and, contrary to Rule 87(5), no regard is had to other relevant models and information[181]
- The parameter estimates used to populate SL CAPM are not the best estimates[182]

ATCO Gas Australia has taken into account a large amount of information relevant in estimating the return on equity. This information includes estimates from other relevant models, independent expert valuation reports, Wright approach, evidence considered by other Australian regulators, relationship between book to market stock returns and the term of the risk free rate[183]. This evidence, as presented by SFG, shows the allowed return on equity using the approach set out in the Guidelines is not commensurate with the efficient financing costs of the benchmark efficient entity, and does not give rise to a rate of return that achieves the ARORO, the NGO or the RPP. The basis for these conclusions is set out in more detail in ATCO Gas Australia's proposal below and in the attached SFG report.

Step 2 Identify parameter values

Step 2 of the process outlined in the Guidelines involves the estimation of ranges for each parameter based on relevant material, determining a point estimate within these ranges which takes into account all relevant material and adjusting for differences in risk if deemed necessary. As the SL CAPM is the only model the ERA identifies as being relevant, the risk free rate, market risk premium and equity beta are the only parameters that are considered for estimation.

In relation to the three parameters identified and estimated by the ERA, ATCO Gas Australia has identified several estimation issues. These issues are covered extensively in Appendix 19 and are summarised below.

Risk free rate

The Guidelines propose to estimate the risk free rate using the yield on Commonwealth Government Securities with a five year term to maturity. However, the evidence suggests that investors assess required returns relative to the yield on ten year government bonds rather than five year government bonds[184].

The use of a five year term is also in contrast to Australian regulators that have recently concluded rate of return guidelines processes. The AER determined that '*On balance, we are more persuaded by the arguments for a 10 year term, than the arguments for a five*

[178] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 74-113.
[179] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 122-139.
[180] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 138-144.
[181] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.
[182] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 346-410.
[183] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 114-121.
[184] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 227-235.

year term'[185]. The Independent Pricing and Regulatory Tribunal (IPART) have determined that they will depart from their previous practise of adopting a 5 year term to maturity as

> *We agree with stakeholder views that increasing the term to maturity from 5 years to 10 years for all industries is more consistent with our objective for setting a WACC that reflects the efficient financing costs of a benchmark entity operating in a competitive market*'[186].

There is agreement between the ERA and ATCO Gas Australia that businesses typically issue debt with a term to maturity of around ten years. The survey evidence presented in the Guidelines demonstrates that the average tenor of debt at the time of issuance by Australian infrastructure businesses is in excess of ten years. This is consistent with CEG's analysis, which found that non-publicly available information sourced from Energy Networks Association members supported an average term of debt at issuance of 10.9 years[187].

Energy network businesses consider the issuance of debt with a long term to maturity to be an efficient financing practice[188] and therefore, expected returns are estimated using a ten year term rather than a five year term. To use a five year term would significantly understate the return on equity. Further discussion on the appropriate term of parameters that contribute to the return on equity and debt is set out in Section 10.9.2 below.

ATCO Gas Australia proposes that where the risk free rate is required as an input, Commonwealth bonds with a yield to maturity of ten years should be used. This approach is consistent with market and regulatory practice of using the yield on ten-year government bonds[189] and is supported by the ERA's evidence that the average tenor of debt at the time of issuance by Australian gas and electricity businesses is in excess of ten years.[190] Based on this evidence, ATCO Gas Australia submits that the risk free rate estimate should be 4.06%, using the indicative averaging period from 22 October to 18 November 2013.

Equity beta

The ERA's Rate of Return Guidelines approach for estimating equity beta effectively follows three steps. First a range of 0.5-0.7 is established from a range of empirical studies. In particular, the ERA has relied on an updated empirical study based on the methodology outlined by Henry[191]. In the second step the Guidelines adopt a point estimate of 0.7 from the nominated range based on an assessment of the downward bias in equity beta estimates with values less than one. The third step involves cross checks of the point evidence, however, the Guidelines do not present any relevant cross checks for the equity beta and therefore the estimate of 0.7 is adopted. The result of partitioning this evidence into three separate steps effectively prevents it from being properly considered in the context of its relative strengths and weaknesses[192] and restricts the ability of any other evidence to influence the range established by the ERA's empirical studies.

ATCO Gas Australia does not consider that the levels of systematic risk for a gas distribution business have declined since the ERA's last assessment of equity beta[193].

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[185] AER 2013, Rate of Return Guidelines, Explanatory Statement, p.182.

[186] IPART 2013, Review of WACC methodology, p.12.

[187] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para.67.

[188] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 153.

[189] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 227-235.

[190] ERA 2013 Appendices to the Explanatory Statement for the Rate of Return Guidelines, Appendix 3.

[191] Henry 2009 Estimation beta, Advice submitted to the Australian Competition and Consumer Commission.

[192] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 359-362.

[193] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 385.

ATCO Gas Australia's experience is that risk has increased as a result of declining average consumption, policy positions that encourage the use of PV cells with continued electricity price subsidies and the regulations in the building industry which increase barriers to gas use (as discussed in Chapter 12, Tariffs). In the current access arrangement the ERA determined an appropriate equity beta was 0.8. If this estimate was overstated, which the ERA's new estimate suggests, it would be expected that there would be some evidence of over-investment in the service provider's network. As demonstrated in Chapter 7 (Past conforming capital expenditure) ATCO Gas Australia spent $270.5 million on efficient investment in the Network which has been demonstrated to meet rule 79, This expenditure was only 3.5% above that approved by the ERA and was driven by a significant overspend in Safety related capital expenditure. The Guidelines do not present any evidence to suggest that gas distribution businesses have been de-risked over recent years, nor has there been any suggestion that the current beta estimate has resulted in over-investment.

The Guidelines also gives no regard to evidence that is relevant to the estimation of equity beta such as data from US comparables, and disregards evidence that demonstrates reliability issues with the estimation approach outlined in the Guidelines[194]. The Guidelines' exclusive reliance on the small sample of Australian-listed firms creates a high level of instability over time both for the same sample of firms and across samples of firms in the same industry. Therefore, the approach outlined in the Guidelines will not result in a return on equity commensurate with the efficient financing costs of a benchmark efficient entity, and does not give rise to a rate of return that achieves the ARORO, the NGO or the RPP.

ATCO Gas Australia proposes that where the equity beta is required as an input, an estimate of 0.82 be used[195]. This estimate was compiled using relevant Australian and international data. The sample from which the equity beta is estimated comprises of nine Australian-listed stocks and 56 U.S.-listed stocks[196]. This estimate overcomes the problems associated with the limited reliability of beta estimates in small samples. The nine Australian-listed firms is the same sample of firms consistently relied upon by both the ERA and the AER in comparable firm analysis. The 56 U.S.-listed firms have been selected after a detailed analysis of industry classifications, the proportion of assets that are regulated and liquidity.

ATCO Gas Australia recognises that, all else being equal, information from an Australian-listed firm will be more relevant than information from a U.S.-listed firm. Therefore, the Australian observations have received twice the weight of those from the US. The overall beta estimate of 0.82 is a weighted average of a beta estimate of 0.58 for Australian-listed stocks and 0.89 for U.S.-listed stocks. ATCO Gas Australia does not consider assigning 100% weight to a small sample of Australian-listed firms, and zero weight to a large sample of U.S.-listed firms, is consistent with having regard to all relevant information.

ATCO Gas Australia submits its estimate of 0.82 for the equity beta is a better estimate than provided for in the Guidelines as:

- It overcomes the statistical issues associated with small samples[197]
- It is consistent with estimates adopted in previous regulatory decisions
- There is no evidence that lower risk or overinvestment occurred in previous regulatory periods as a result of a higher equity beta

[194] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 359-388.
[195] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 431.
[196] Appendix 22: Regression based estimates for risk parameters for the benchmark firm, SFG, June 2013 .
[197] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.

Market risk premium

The Rate of Return Guidelines approach for estimating the market risk premium (MRP) also follows a three step process which effectively prevents the proper consideration of relevant information. In the first step a range of 5.0-7.5% is established based on a historical mean estimate and the estimate produced from the dividend growth model. In the second step a point estimate of 6.0% is selected based on an assessment of the level of perceived risk in the equity market and evidence suggesting that the return on equity is mean reverting. The third step involves cross checks of the point evidence, however, the guideline does not present any relevant cross checks for the MRP and therefore the estimate of 6% is adopted. As is the case with equity beta, partitioning evidence into three separate steps effectively prevents it from being properly considered in the context of its relative strengths and weaknesses[198].

In particular, ATCO Gas Australia is concerned that the estimate of the MRP presented in the Guidelines is not the best estimate, as the primary range of 5-7.5% has been incorrectly established. Evidence relating to the downward bias in the historical mean estimate[199] and a recent DGM study by IPART[200] suggests that the approach set out in the ERA's Rate of Return Guidelines is not the best estimate of the MRP. Further, there is no justification for choosing a point estimate below the midpoint of the range. Therefore the approach outlined in the ERA's Guidelines for estimating the MRP will not result in a return on equity that is commensurate with the efficient financing costs of a benchmark efficient entity and does not give rise to a rate of return that achieves the ARORO, the NGO or the RPP because:

- It is not the best estimate of the MRP
- It is assumed that there is no inverse relationship between the MRP and risk free rate as accepted and demonstrated by other methods and models

ATCO Gas Australia notes the SL CAPM requires the MRP to be the difference between the required return on the market and the risk free rate. Estimating the MRP parameter is a widely debated topic due to its disputed relationship with movements in the risk free rate. Therefore, instead of specifically estimating the MRP parameter, ATCO Gas Australia proposes to use all relevant information to estimate the required return on the average firm that is consistent with the prevailing conditions in the market. This material is considered relevant as all asset pricing models begin with an estimate of the required return on the market and then make adjustments for the extent to which the firm in question is considered to be different from the average firm. Further, it allows both theories relating to the relationship between the MRP and risk free rate to be taken into account.

In order to estimate the required return on equity for the market ATCO Gas Australia has considered four approaches:

- Dividend growth model estimate of the contemporaneous required return on the market of 11.3%[201]
- Wright approach estimate of the required return on the market of 11.7%[202]
- Ibbotson approach estimate of the required return on the market of 10.6%[203]

[198] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 389-392.
[199] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 399-401.
[200] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 403.
[201] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.
[202] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.

- Survey evidence from independent valuation experts resulting in a with-imputation estimate of 11.3%[204]

ATCO Gas Australia recognises that all of these approaches each have their own strengths and weaknesses. Therefore, in order to arrive at an average market estimate ATCO Gas Australia proposes to apply equal weight to each approach. This method produces an estimate of 11.2%[205] for the required return on the market which implicitly incorporates an estimate of the MRP. These methods are addressed in more detail in 10.8.1.

Step 3 Estimate return on equity

Step 3 involves populating the relevant models with parameter point estimates in order to arrive at an overall cost of equity estimate. Sole reliance on the SL CAPM results in the return on equity being determined as a product of changes to parameter values, rather than consideration of other relevant estimates. Therefore the estimate only reflects the parameter values identified and the result is not addressed against the ARORO.

ATCO Gas Australia does not agree with the rationale for excluding other relevant cost of equity models from consideration and therefore does not agree that the estimate produced from the SL CAPM model should effectively be afforded 100% weighting. If this step includes estimating the return on equity with only the SL CAPM, excluding other relevant models, and estimates of parameters which cannot be considered the best estimates, it does not meet the requirements of rule 87.. Further, this step provides no test of the resulting estimate against the ARORO.

Step 4 Conduct cross checks

Step 4 specifies the consideration of cross checks of parameter estimates and the overall return on equity, and consideration of whether the return on equity estimate achieves the ARORO. As demonstrated in the attached SFG report in Appendix 19, the cross checks applied in this step do not appear to have any effect on the overall return on equity estimate. As the prior steps have excluded other relevant estimation methods, models and market data this step effectively has no impact on the return on equity estimate.

In relation to the design of these cross checks, the ERA refers to the data and evidence listed in Appendix 29 to the Explanatory Statement to the Rate of Return Guidelines. However, the items set out in this appendix do not appear to be cross checks which the ERA has applied to the return on equity estimate. The material set out in that appendix is either:

- Not used at all
- Used to inform the estimate of individual parameters rather than the estimate of the return on equity
- Has no material effect on the estimate of the allowed return on equity

While ATCO supports the use of appropriate reasonableness tests for the estimation of the rate of return, it has been demonstrated that the ERA's Guidelines are not clear in design and application of cross check material and are not consistent in treatment of information identified as relevant. ATCO Gas Australia submits Step 4 of the ERA's approach is

[203] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.

[204] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.

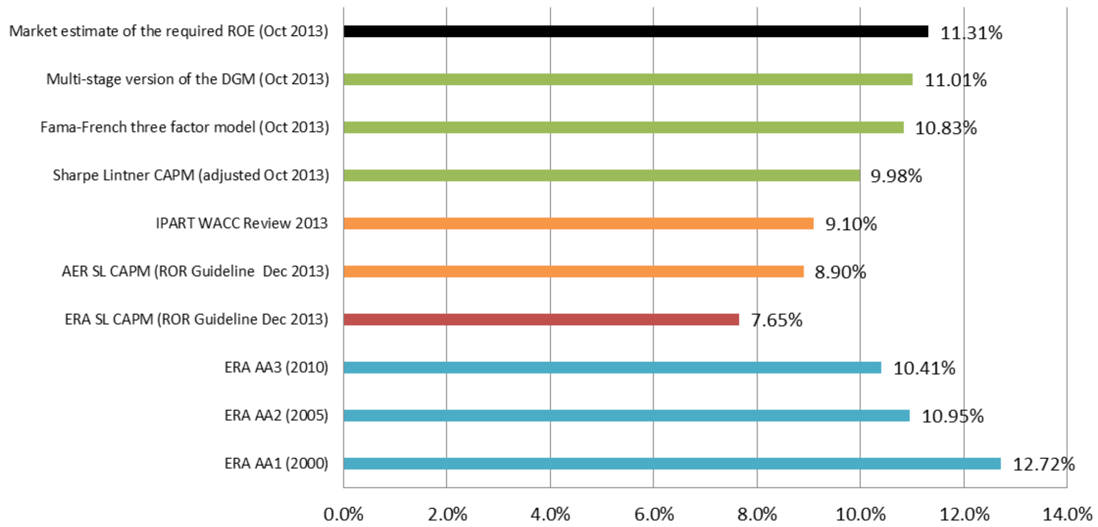
[205] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.430.

inconsistent with the new Rules to the extent that the issues set out above result in relevant evidence being denied the opportunity to inform the estimate of the required return on equity.

Step 5 Determine the return on equity

The Guidelines state this step represents the finalisation of the estimate for the return on equity, taking into account all relevant information which ensures that it meets the ARORO. The Guidelines note that where there are multiple estimates of the return on equity it may be appropriate to adopt a formal weighting approach to ensure that each piece of information is considered according to its merits. However, as the Guidelines finds only the SL CAPM is relevant at this time no weighting mechanism has been applied. Figure 85 below shows a comparison of the worked example in the Guideline with other return on equity estimates. The other estimates include those from other relevant estimation methods, models and market data[206] as well as the return on equity previously applied to ATCO Gas Australia. According to the Guidelines only the SL CAPM is relevant. However, even if this was accepted, other estimates utilising by the SL CAPM are considerably greater than the estimate provided as an example in the Guidelines. This highlights the likely flaws in the parameter estimates compared to other regulators and estimates.

Figure 85: Comparison of return on equity



Regardless of the method, model or approach, the worked example generated in the Guidelines produces the lowest estimate identified. The ERA methodology fails to have regard to numerous relevant models and information and accordingly does not give rise to the best estimate of the rate of return commensurate with the risk of a benchmark entity. To accept that it would achieve the ARORO requires accepting the proposition that other estimates from models, market valuations and regulators are irrelevant or wrong. ATCO Gas Australia submits that this is not the case as is discussed in the following sections. As set out above and in SFG's expert report[207], it is also in direct conflict with the requirement

[206] Forming ATCO Gas Australia's proposal outlined in section 10.8.

[207] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.

to have regard to relevant estimation methods, financial models, market data and other evidence[208].

Consideration of the information presented by ATCO Gas Australia and SFG, clearly demonstrates the ERA has omitted relevant evidence and utilised parameter estimates that result in a required return on equity that is:

- Not commensurate with estimates from other models and approaches[209]
- Not commensurate with other ways of implementing the SL-CAPM[210]
- Not commensurate with realised returns on equity from prior periods
- Not commensurate with estimates from independent expert valuation professionals[211]
- Not commensurate with the prevailing cost of equity[212]
- Not commensurate with estimates from other regulators[213]
- Not commensurate with benchmark efficient financing costs[214]

Consequently, the approach in the Guidelines does not produce a cost of equity estimate that meets the ARORO, the NGO or the RPP.

10.8 ATCO Gas Australia's return on equity proposal

ATCO Gas Australia has considered a range of relevant estimation methods, models, market data and evidence when estimating the required return on equity. ATCO Gas Australia sought expert advice to ensure all relevant evidence was identified, tested and properly considered in undertaking this task. This advice included an assessment of the Guidelines against the requirements of the NGR, NGO and RPPs and the implications of adopting the Guidelines. ATCO Gas Australia's estimate of the required return on equity of 10.70% is consistent with the ARORO and meets the requirements of Rule 87, the NGO and RPP.

ATCO Gas Australia's estimate does not follow the approach set out in the Guidelines as this:

- Wrongly excludes relevant estimation methods, financial models, market data and other relevant information and erroneously concludes that only the SL CAPM is relevant
- Does not utilise the best parameter estimates when applying the SL CAPM
- Does not provide for an assessment of the resulting return on equity against the ARORO

[209] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.
[210] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.
[211] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.
[212] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.
[213] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.
[214] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.

ATCO Gas Australia proposes the cost of equity be estimated after consideration of four separate cost of equity estimates, which rely upon different equations and empirical support. These cost of equity estimates relate to the outputs of the required return of the average firm, the SL CAPM, the Fama French Model and the dividend growth model (DGM). This approach considers all relevant estimation methods, financial models and market data in a single step, ensuring all evidence is considered in the context of its own strengths and weaknesses. This approach also has the effect of eliminating restrictions on the ability of evidence to influence the return on equity estimate.

Discussion of each technique and consideration of each estimate's role in determining the return on equity is set out in the expert report by SFG. The models and their associated estimates used by ATCO Gas Australia to determine the required return on equity for the benchmark firm are:

- The required return of the average firm - 11.2%
- The SL CAPM – 9.9%
- The Fama-French model – 10.8%
- The DGM – 10.9%

10.8.1 Required return of the average firm

As outlined above, ATCO Gas Australia proposes that the estimate of the required return of the average firm is relevant in determining the overall cost of equity. As the required return of the average firm is the starting point of most asset pricing models, it is fitting that it is also the starting point of ATCO Gas Australia's return on equity estimate.

In order to estimate the required return on equity for the average firm ATCO Gas Australia has considered four approaches:

- Dividend growth model estimate of the contemporaneous required return on the market of 11.3%[215]. This estimate is based on information provided by equity analysts such as earnings forecasts, dividend forecasts and price targets. ATCO Gas Australia submit that this is relevant information for deriving the return on equity for the market
- Wright approach estimate of the required return on the market of 11.7%[216]. This estimate assumes the required return on equity is constant across different market conditions and that the MRP and risk free rate are perfectly negatively correlated.
- Ibbotson approach estimate of the required return on the market of 10.6%[217]. This estimate assumes the MRP is constant so that the required return on equity moves directly with changes in the risk free rate.
- Survey evidence from independent valuation experts resulting in a with-imputation estimate of 11.3%. This estimate is based on the recent Grant Samuel[218] report and

[215]Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.

[216]Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.

[217]Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.428.

[218]Appendix 21: Financial services guide and independent experts report to the independent board sub-committee in relation to the proposal by APA group Grant Samuel & Associates.

provides an indication of the value of the required return on equity that is being used in the market for equity funds.

In recognition that each of these approaches has strengths and weaknesses, it is proposed that equal weight is applied to each approach. This method produces an estimate of 11.2%[219] for the required return of the average firm.

10.8.2 SL CAPM

ATCO Gas Australia agrees with the ERA that the SL CAPM is relevant and should be considered in the estimation of the rate of return. SL CAPM like other models has strengths and weaknesses and is affected by estimates of input parameters. The SL CAPM is acknowledged to have poor empirical performance; inability to reflect changes in market conditions; and failure to achieve rates of return that would be consistent with the outcomes of efficient, effectively competitive markets[220]. These weaknesses can be addressed, at least in part, by incorporating appropriate and correctly estimated parameter inputs. ATCO Gas Australia has incorporated the following parameter estimates into the SL CAPM:

- Risk free rate of 4.06% derived from the yield on Commonwealth Government Securities with a term to maturity of ten years. This estimate is consistent with market and regulatory practise[221] and is supported by the ERA's own evidence that the average tenor of debt at the time of issuance by Australian gas and electricity businesses is in excess of ten years

- Estimate of the required return on the market of 11.2% as estimated through the simple weighted average approach discussed in the previous section

- Equity Beta estimate of 0.82[222] based on a range of regression analyses applied to a large sample of domestic and international comparables. This estimate overcomes statistical issues associated with small samples and is consistent with past regulatory practice

ATCO Gas Australia has estimated the return on equity from the SL CAPM properly applied to be 9.9%.

10.8.3 Fama French

ATCO Gas Australia considers the Fama French model (FFM) is relevant and should be considered in setting the return on equity, as it is theoretically sound and is commonly used by market practitioners as well as in academic research. As demonstrated by SFG[223], the Fama French model generally satisfies the criteria outlined in the Guidelines at least as well as the SL CAPM. Specifically, the FFM is fit for purpose; driven by economic principles; supportive of robust, transparent and replicable analysis; as well as supportive of specific regulatory aims. Therefore the FFM is not irrelevant to the estimation of the return on equity. ATCO Gas Australia has based its estimate from the Fama French model on the SFG 2013[224] study which sets out the most recent estimates of beta and the size and book-to-market premiums using Australian and US-listed observations. As a result, ATCO Gas Australia's FFM estimate encompasses the most recent and relevant market information. In

[219] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para.430.

[220] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 114-121.

[221] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 347-358.

[222] Appendix 22: Regression based estimates for risk parameters for the benchmark firm, SFG, June 2013.

[223] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 74-113.

[224] Appendix 22: Regression based estimates for risk parameters for the benchmark firm, SFG, June 2013.

order to arrive at an estimate the Fama French model has been populated with the following parameters:

- Market beta of 0.79
- Risk premium in relation to the size factor of -0.17%
- Risk premium in relation to the book-to-market of 1.23%
- Risk free rate and required return on the market as specified in the SL CAPM model

This results in an estimate of the required return on equity of 10.8%

10.8.4 DGM

The foundation of the dividend growth model is that share prices represent the present value of expected dividends. Therefore, the dividend growth model estimate represents the discount rate that sets the present value of all expected future cash flows to equity holders equal to the share price. As identified by SFG, the DGM approach has a sound basis and is extensively used in practice, including for the purpose of determining regulatory rates of return[225]. As such, ATCO Gas Australia considers industry DGM estimates are relevant in the estimation of the return on equity.

The dividend growth model analysis relied upon by ATCO Gas Australia takes information provided by equity analysts such as earnings forecasts, dividend forecasts, and price targets and derives estimates of the cost of equity using all available data in a systematic manner. In ATCO Gas Australia's view, cost of equity estimates derived from forecasts of earnings, dividends and share prices constitute relevant information and should therefore be given consideration under the Rules.

In its Guidelines the ERA elected not to give consideration to dividend growth model estimates of the cost of equity on the basis that the inputs into the model are subjective, the model is not based on a strong theoretical foundation and that, "without further development" it has shortcomings with regard to being fit for purpose. While the ERA has dismissed dividend growth model estimation as a relevant model for estimating the cost of equity for the overall market or benchmark firm, it considers it is relevant to inform the range from which the market risk premium is estimated, for the application of providing this input to the Sharpe Lintner CAPM. It is unclear to ATCO Gas Australia how a model could be considered relevant for the estimation of a range for a particular parameter of the SL CAPM but it is not considered relevant for measuring the cost of equity for the overall market or a benchmark firm.

ATCO Gas Australia submits the approach it employs for dividend growth model estimation addresses the limitations highlighted in the Guidelines[226]. In order to estimate the return on equity using the DGM, ATCO Gas Australia has relied on the SFG study[227] which applies the DGM approach of Fitzgerald, Gray, Hall and Jeyaraj (2013). This approach corrects for bias in the DGM estimates and has recently been published in a peer-reviewed international journal.

[225] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, para. 122-139.

[226] The analysis relied upon by ATCO is derived using all available data from 2002 onwards, which comprises more than 40,000 sets of individual analyst forecasts. The model has been developed to minimise the subjective element of inputs, in particular the assessment of the "correct" level of long-term growth in dividends, outside of a near-term forecast horizon.

[227] Appendix 22: Regression based estimates for risk parameters for the benchmark firm, SFG, June 2013.

The DGM estimate of the required return of the benchmark comparable firm is 10.9%.

10.8.5 Return on equity estimate

The return on equity proposed by ATCO Gas Australia is a simple average of the four estimates discussed above being:

- The required return of the average firm - 11.2%
- The SL CAPM – 9.9%
- The Fama-French model – 10.8%
- The DGM – 10.9%

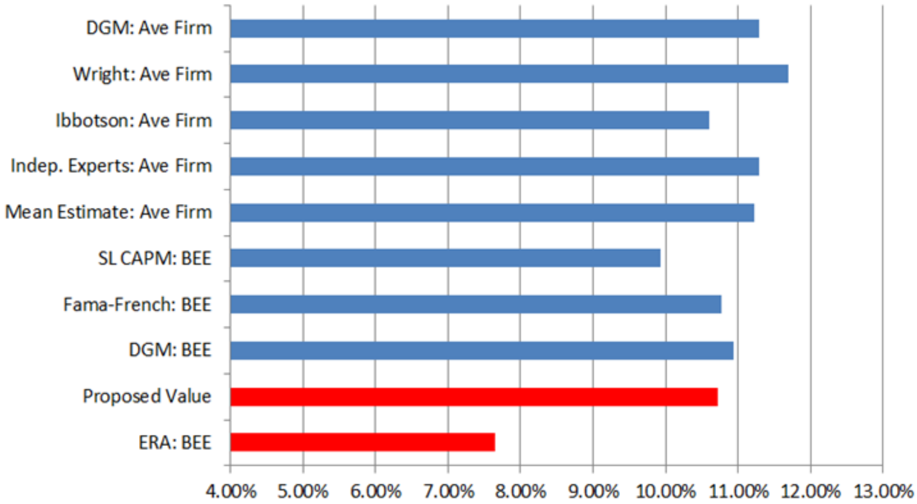
The weighting of each estimate has been determined according to considerations of relevance and reliability. Assigning weights to individual cost of equity estimates provides a transparent mechanism for reaching a conclusion. It also means consideration given to any individual estimate does not vary depending upon the magnitude of that estimate. In its Guidelines, the ERA accepts that where there are multiple relevant estimation methods, financial models, market data and other evidence informing the return on equity, then the ERA will combine these to form a range. The ERA also recognises that:

> *…it may be appropriate in some circumstances to adopt a formal weighting approach for each estimation method or model for the purpose of determining the range.*[228]

Consistent with the views of its expert, SFG, ATCO Gas Australia propose to give all four estimates equal weighting in recognition that they all have different strengths and weaknesses. Applying equal weights to the return on equity estimates from multiple models results in an overall return on equity of 10.7%. The NGR requires the cost of equity be estimated having regard to all relevant information. The proposal put forward by ATCO incorporates all relevant information into the cost of equity estimate in an objective and transparent manner and in a manner that the ERA's Rate of Return Guidelines themselves contemplates but does not achieve.

[228] ERA Rate of Return Guidelines, para. 117.

Figure 86: Return on equity generated from multiple models[229]



To place ATCO's position on the cost of equity in context, consider

Figure 86 above. In addition to an estimate for the ERA, there are eight cost of equity estimates derived from four models, two market risk premium estimates (the dividend growth model estimate of 7.24% and the ERA's regulatory estimate of 6.00%), and two sets of comparable firms (Australia and the United States). Figure 86 also presents the return on equity measured for the average firm and the benchmark efficient entity (BEE). This demonstrates that in arriving at the estimate for the return on equity, ATCO Gas Australia has relied upon all relevant information.

ATCO Gas Australia submits that its consideration of multiple cost of equity methods, models and market data used to derive the estimate for the required return on equity gives rise to the best estimate of the cost of equity which meets the ARORO, the NGO and the RPP. Further, as demonstrated by SFG[230], the range from ATCO Gas Australia's multi model approach is consistent with all relevant market evidence and independent expert reports[231].

10.9 Cost of debt

The cost of debt is the sum of the risk free rate and the debt margin. The debt margin represents the compensation above the risk free rate required by investors for credit, liquidity and maturity risks.

Consistent with the Guidelines, ATCO Gas Australia will base its estimate of the return on debt on a risk premium over and above the risk free rate, combined with a margin for administrative and hedging costs. The fundamental difference between the approach to the cost of debt in the Guidelines and ATCO Gas Australia's approach relates to the term to maturity of benchmark debt, the estimation of the debt risk premium and the absence of an annual update.

[229] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014, Figure 10.

[230] Appendix 19: Estimating the Required Return on Equity for ATCO Gas Australia, SFG, March 2014.

[231] Appendix 23: Evidence on the required return on equity from independent expert reports, SFG, June 2013. Appendix 35: Market Evidence on cost of equity, Victorian Gas Access Arrangement Review, 2013-2017, Ernst & Young Nov 2012.

10.9.1 Rate of Return Guidelines approach

ATCO Gas Australia considered applying the cost of debt approach in the Guidelines. However, this approach estimates the cost of debt based on:

- An estimate of the yield on Commonwealth Government Securities with a five year term to maturity averaged over a 40 day period just prior to the regulatory period
- An estimate of the debt risk premium prevailing at the beginning of each regulatory year derived from the ERA's Bond Yield Approach
- An allowance for debt raising and hedging costs totalling 0.15%

This approach does not result in an estimate of a return on debt that achieves the ARORO or complies with the NGR. This is because it:

- Is not consistent with an implementable efficient debt management strategy
- Is based on a term of debt that is not efficient and results in an underestimation of the cost of debt
- Introduces additional requirements for an annual update that has no other effect than to increase the risk faced by the business with no additional compensation
- Results in an estimate that does not provide an opportunity to recover the efficient costs of debt
- As noted above, for these reasons ATCO Gas Australia does not consider the Guidelines reflect the requirements of Rule 87 and its proposal departs from the Guidelines in estimating the cost of debt[232].

10.9.2 Implementable efficient debt management strategy

ATCO Gas Australia submits that the ERA's methodology in the Guidelines for estimating the cost of debt does not represent an estimate of and efficient debt management strategy. This is because:

- The use of a 5 year term of debt is not commensurate with efficient debt financing costs
- The annual DRP update introduces additional risk that cannot be managed and is not accompanied by any form of compensation

Each of these issues is addressed in more detail below. As demonstrated by CEG[233], there is no feasible debt financing strategy that will give rise to such a cost of debt consistent with the ERA's calculation procedure. In other words, it is impossible for an entity to engage in any debt issuance or hedging strategy that would give rise to it having a cost of debt commensurate with that estimated under the ERA's methodology. In order to meet the ARORO, the NGO and RPP, it is necessary to estimate the cost of debt that is commensurate with the efficient financing costs of a benchmark efficient entity with a similar

[232] ATCO Gas Australia also refers to and relies on the letter to the ERA submitted with this proposal dated 17 March 2014 in respect of the application of the Guidelines.

[233] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 4-10.

degree of risk as that which applies to the service provider. It is impossible to do so if the estimate is of a debt management strategy that cannot actually be implemented.

10.9.3 Term of debt

The Guidelines arrive at a term of debt by determining the average maturity of the bonds in the ERA sample used to implement the bond yield approach. Therefore, the term of debt will vary depending on the bonds that are in the sample and the weights applied to them.

In arriving at the term of debt the ERA consider the following evidence:

- Regulated utilities issue ten year debt
- Due to the fact that debt is issued gradually through time, the average remaining maturity of a bond is only a little over five years
- The yields a business has to pay to service its debt is determined by the remaining term to maturity and not the term to maturity at issuance

The ERA and ATCO Gas Australia agree that businesses typically issue debt with a term to maturity of around ten years. As presented earlier in the above risk free rate discussion, there is evidence to suggest it is common practice for energy network businesses to issue long term debt, in excess of ten years[234]. The near universal adoption of this practice provides strong evidence that this is an efficient practice and will lower the overall finance costs of a regulated energy business[235].

The area of disagreement between Guidelines and ATCO Gas Australia's proposed approach relates to whether the regulated rate of return should be set with respect to the average term remaining on debt or the term of debt at issuance.

The Guidelines consider it is the remaining term to maturity of the bond over the sampling period that should determine the appropriate term of debt[236]. The Guidelines also conclude that setting the term of the debt risk premium, and therefore the term of debt, in excess of the length of the regulatory period will result in a deviation from the NPV=0 principle. The premise of the NPV=0 principle is that the present value of a service provider's revenue stream should match the present value of the expenditure stream.

The Guidelines adopt the view that the regulatory return is likely to closely match the NPV=0 condition when the term of the components of the return on equity and debt match the length of the regulatory period. In arriving at this position the Guidelines rely on the analysis of Associate Professor Lally. ATCO Gas Australia considers that the ERA has incorrectly interpreted Lally's advice.

ATCO Gas Australia's interpretation of Lally is that the study is based on the average term at issuance of debt being longer than the regulatory period, not the average remaining term being longer than the regulatory period[237]. However, when it comes to determining the term assumption, the Guidelines base the term of debt on the remaining term of the bonds in the bond yield sample.

[234] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 67-70.

[235] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 71-74.

[236] ERA 2013, Explanatory statement for the Rate of Return Guidelines, Appendix 3.

[237] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, Appendix C.

The AER considered this issue during its Rate of Return Guidelines[238] process and ultimately found that:

> *An assumption of NPV neutrality over a five year regulatory period may, on average, be unlikely to equal the firms' debt financing costs[239].*

ATCO Gas Australia submits the term of debt specified in the Guidelines would only provide for costs of issuing five year debt which is inconsistent with relevant evidence and as a result the cost of debt is not commensurate with the efficient financing costs of a benchmark efficient entity.

As mentioned previously, the ERA's own analysis confirms infrastructure businesses issue ten year debt[240]. However, the Guidelines adopt the position that it is the remaining term to maturity, not the maturity at issue which should determine the term of the risk free rate. This position is contrary to the conclusions of the AER, which found that:

For the purposes of estimating debt yield compensation we consider that it is appropriate to consider:

> *… Term at issuance rather than term to maturity. Term at issuance reflects the premium associated with the original term length. An issuer must pay this premium irrespective of the premium at a subsequent point in time, as reflected by the term to maturity[241].*

ATCO Gas Australia submits it is the term at issuance that determines the costs that a business must pay to service its debt, not the remaining term. This position is supported by the worked example provided by CEG[242] and analysis of the AER[243] in its recent Rate of Return Guidelines. Measuring the remaining term rather than the term at issuance greatly underestimates the cost of debt. Therefore, the efficient costs reflect the cost of debt associated with a ten year term to maturity. A ten year term is consistent with the observed term of debt issued by regulated businesses and represents the efficient financing costs of a benchmark efficient entity.

10.9.4 Estimation of the debt risk premium

The process outlined in the Guidelines for determining the debt risk premium involves the bond yield approach together with the joint weighting mechanism. The bond yield approach is based on the observed yields of relevant Australian corporate bonds, taken from Bloomberg that meet the criteria for inclusion in the benchmark sample. The criteria for inclusion in the benchmark sample is as follows:

- Credit rating of each bond must be BBB- to BBB+ as rated by Standard & Poor's
- Remaining time to maturity of at least two years
- Bonds must be issued in Australia, by Australian entities and denominated in Australian dollars

[238] AER 2013, Explanatory statement rate of Return Guidelines.

[239] AER 2013, Explanatory statement rate of Return Guidelines, p.147.

[240] ERA 2013, Explanatory Statement for the Rate of Return Guidelines, Appendix 3 pp.38-39.

[241] AER 2013. Explanatory Statement to the Rate of Return Guideline, p.144.

[242] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, Appendix C.

[243] AER 2013, Explanatory statement for the rate of return guidelines, p.144.

- Fixed and floating bonds are included
- Bullet, callable and putable bonds are included
- At least ten yield observations over the required 40 day averaging period

ATCO Gas Australia submits that the ERA's criteria are unnecessarily restrictive, particularly in relation to the exclusion of bonds issued by Australian entities overseas. Issuing bonds overseas is a common practice for regulated Australian utilities, especially when it comes to issuing long term debt. This has been recognised by the Reserve Bank of Australia, which notes Australian non-financial corporations source much of their longer-term bond funding from the US market where investor demand for longer dated debt is strong[244]. As a result, the RBA has included foreign issued bonds in its sample for Australian Corporate Credit Spreads.

CEG has also estimated foreign currency bonds account for close to half of all bonds issued by Australian regulated energy utilities[245]. Given the significance of foreign issued bonds in the actual debt management practices of regulated energy utilities the benchmark sample should include these bonds.

The bond yield approach set out in the Guidelines also has issues regarding the maturity of the resulting estimate. There is no mechanism in place to ensure the DRP derived from the bond yield approach is consistent with the benchmark efficient term of debt. This is because the underlying maturity of the Debt Risk Premium (DRP) estimate is determined by the maturity of bonds that fall within the benchmark sample and the weighting that each bond receives in the joint-weighting approach. That is, while the Guidelines determine that the appropriate term of debt is five years, there is no mechanism in place to ensure that the estimate of the DRP is on the same basis. This means there is no guarantee that the weighted average DRP of bonds in the benchmark sample is relevant to the benchmark term.

Further, the bond yield approach is not a transparent or replicable process and the Bloomberg source from which the yield data is obtained is not specified.

ATCO Gas Australia submits the methodology set out in the Guidelines for estimating the debt risk premium will not result in a reliable estimate of the prevailing efficient cost of debt for a benchmark efficient entity. This is because the bond yield approach does not have regard to all of the available data and has not been estimated for any defined maturity level. This results in a large degree of uncertainty around the estimate and does not facilitate an efficient debt management strategy[246].

Since the publication of the Guidelines in late 2013, new information relating to the estimation of the debt risk premium has become available. The Reserve Bank of Australia (RBA) began publishing credit spreads for Australian non-financial corporations in December 2013. Credit spread data provides information on bond market conditions which can be used to estimate the debt risk premium. The credit spreads produced by the RBA include those within the A and BBB bands across maturities ranging from one to ten years.

The methodology behind the RBA's estimates is transparent, well documented and repeatable. ATCO Gas Australia submits the RBA data is relevant and the best source to use for estimating the cost of debt.

[244] RBA 2013, New Measures of Australian Corporate Credit Spreads, Bulletin, December Quarter 2013.

[245] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 165.

[246] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 6.

The RBA applies a set of criteria in order to determine the bond sample which informs its yield estimate at each maturity. To be included in the RBA's sample to estimate yields on BBB debt the bonds must:

- Be rated BBB-, BBB or BBB+ by Standard & Poor's, or if unrated have an issuer credit rating with Standard & Poor's in that band
- Be a fixed rate bond
- Be issued in Australia by an Australian company in either Australian dollars, United States dollars or Euros
- Have raised more than $100 million or its equivalent in foreign currency terms at the time of issue
- Have a residual term to maturity of at least one year
- Not have any duplicate bond issues in the sample

The RBA's criteria are far less restrictive than the approach set out in the Guidelines, which has the effect of increasing the size of the sample of bonds over the averaging period. The RBA's criteria also allow the inclusion of bonds issued by Australian companies overseas. It is common practice for regulated Australian businesses to issue long term debt in overseas markets, particularly in the US where investor demand for longer dated bonds is strong[247].

Once the sample has been established the RBA estimate yield for a particular maturity based on a weighted average. The yield of each bond is weighted by the product of:

- The face value of the bond, such that larger bond issues receive greater weight in the assessment of the benchmark spread or yield
- The relative closeness of the bond to the target maturity, such that bond issues closest to the target maturity receive greater weight

The main advantage of the RBA's methodology is that its bond sample targets an average term of ten years due to the inclusion of bonds with embedded options which tend to be issued with longer maturities and assigns greater weight to bonds with remaining maturities closer to ten years[248].

Further, the RBA's less restrictive criteria and weighting mechanism results in cost of debt estimates that are a good fit to the relevant historical data[249]. It is also consistent with the behaviour of the Bloomberg BBB and A rated fair value curves[250]. Further, the New South Wales Independent Pricing and Regulatory Tribunal (IPART) has adopted the RBA ten year BBB estimate as the best estimate of the cost of debt for infrastructure businesses it regulates[251]. Therefore, ATCO Gas Australia submits the RBA Corporate Credit Spread data represents the best method by which to estimate the cost of debt[252].

[247] RBA 2013, New Measures of Australian Corporate Credit Spreads, Bulletin, December Quarter 2013.

[248] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 167-173.

[249] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 187.

[250] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 198.

[251] IPART 2014, New Approach to Estimating the Cost of Debt: Use of the RBA's Corporate Credit Spreads.

[252] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 205.

10.9.5 Annual update

The Guidelines set out that the allowance for the cost of debt will be updated annually to reflect movements in the debt risk premium. The ERA's analysis and that of its consultants recognises an annual update of the cost of debt will increase the risks faced by regulated businesses. The rationale for the use of an annual update is that it promotes economic efficiency by regularly updating the cost of debt to reflect the cost of newly issued debt. The ERA accepts it would be very difficult for any entity to arrange its debt financing strategy so it actually incurred debt costs that vary each year[253].

ATCO Gas Australia submits the annual update of the debt risk premium does not represent an efficient debt management strategy. This is because it introduces:

- Additional risks and costs that cannot be managed and would require additional compensation, increasing costs to customers

- Price volatility for customers

Further, the debt risk premium paid by a business is fixed for the term of that debt. Updating the DRP annually does not actually reflect a change in the costs incurred by the business. As demonstrated by CEG[254], there is no feasible debt financing strategy that will give rise to such a cost of debt consistent with the ERA's calculation procedure. It is impossible for an entity to engage in a debt issuance or hedging strategy that would give rise to it having a cost of debt commensurate with that estimated under the ERA's methodology.

ATCO Gas Australia submits an annual update to the cost of debt does not represent an efficient practice that a benchmark firm would undertake as a part of normal business practice. By implementing an annual update, and essentially forcing businesses to refinance annually, the ERA would be imposing an inefficient practice upon network service providers. Such a practice would incur significant costs, which would be in addition to the debt issuance and hedging costs recognised by the ERA.

10.10 ATCO Gas Australia's cost of debt proposal

The ARORO states the allowed rate of return must be commensurate with the efficient financing costs of a benchmark efficient entity. It follows that the allowed return on debt must be commensurate with the efficient financing costs of servicing a debt financing strategy that is efficient in the circumstances. ATCO Gas Australia submits the appropriate costs should be determined by:

- Establishing the efficient debt financing strategy that would be employed by an efficient benchmark entity in the circumstances of the business that is being regulated

- Setting the allowed return on debt to be commensurate with the efficient costs of servicing that efficient debt financing strategy

There may be many efficient financing strategies which minimise the costs of a business in certain circumstances. In CEG's review of efficient financing strategies they find that a ten year trailing average would best meet the ARORO[255]. However, CEG also note that to the extent a business has been able to implement a debt management strategy that was

[253] ERA 2013, Explanatory statement for the Rate of Return Guidelines, para. 365.
[254] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 4-10.
[255] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 11-18.

consistent with the regulatory practice of 'on the day' estimates, it may be appropriate for that business to continue with an 'on the day' approach and transition to a trailing average at some future date. A transition allows debt management strategies to be unwound more efficiently. ATCO Gas Australia is not proposing a trailing average but considers this approach may be the most efficient if implemented over time. ATCO Gas Australia considers continuing the on the day approach is appropriate and efficient in the present circumstances where regulatory precedent has been to use this approach.

In estimating the cost of debt ATCO Gas Australia has had regard to all relevant estimation methods, market data and other evidence. In particular, ATCO Gas Australia has considered the costs associated with efficient financing practices that a benchmark efficient entity would incur. To estimate these costs, ATCO Gas Australia has relied on new data published (Corporate Credit Spreads) by the RBA which is transparent, independent and repeatable. The RBA data is also fit for purpose, as recognised by IPART which plans to adopt the data to estimate the debt risk premium[256] for the businesses it regulates.

10.10.1 Benchmark credit rating

The debt risk premium component of the return on debt will reflect the benchmark credit rating. In its Guidelines the ERA establishes the credit rating for Australian gas businesses is within the BBB band and encompasses BBB-/BBB/BBB+. ATCO Gas Australia notes this band has been derived from the ratings of Australian electricity and gas network service providers. ATCO Gas Australia accepts an appropriate benchmark credit rating for an Australian Gas business sits within the BBB band.

10.10.2 Term of debt

ATCO proposes a term of ten years be adopted for the term of debt to ensure that the cost of debt reflects an efficient term and therefore, the efficient costs of debt. This term is consistent with the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

As discussed above, the use of a ten year term to maturity is consistent with the actual observed financing of infrastructure assets and the ERA's analysis[257]. The use of term at issuance rather than remaining term to maturity is supported by the analysis of Lally, the worked example provided by CEG[258] and analysis of the AER[259] in its recent Rate of Return Guidelines.

10.10.3 Methodology to estimate the cost of debt

ATCO Gas Australia submits the best estimate of the cost of debt is one based on the RBA's Australian Corporate Credit Spreads for BBB rated ten year Australian corporate debt[260].

The most recent estimate for BBB rated ten year Australian corporate debt was released on 28 February 2014. Although this is a different period to that used for estimate the return on equity, ATCO Gas Australia notes that it is a lower estimate than the October 2013 estimate. It is ATCO Gas Australia's proposal that the sampling period for deriving the

[256] IPART 2014, New Approach to Estimating the Cost of Debt: Use of the RBA's Corporate Credit Spreads.

[257] ERA Appendices to the Explanatory Statement for the Rate of Return Guidelines, Appendix 3, para.40; PWC (2013), p. ii to iii. The term of debt at issuance is closer to 20 years for firms in the United States and the United Kingdom.

[258] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, Appendix C.

[259] AER 2013, Explanatory statement for the rate of return guidelines, p.144.

[260] Appendix 20: Cost of debt consistent with the NGR and NGL, Dr Tom Hird, CEG March 2014, para. 205.

market-based parameters of the rate of return will be agreed closer to the Final Decision. It is ATCO Gas Australia's intention to update the RBA estimate for the most recent estimate at the time of the Final Decision.

The February 2014 RBA estimate of BBB rated ten year Australian corporate debt is 6.94%[261]. This is the best estimate of the cost of debt which meets the ARORO, the NGO and the RPP. ATCO Gas Australia propose to update the estimate closer to the Final Decision.

10.10.4 Debt issuance and hedging costs

Debt issuance and hedging costs are transaction costs incurred each time debt is raised or refinanced. Debt raising costs may include underwriting fees, legal fees, company credit rating fees and other transaction costs. Debt raising costs are an unavoidable aspect of raising debt that would be incurred by a prudent service provider acting efficiently. Regulators recognise an allowance to recover an efficient amount of debt raising costs is appropriate.

ATCO Gas Australia will incorporate the direct components of debt raising costs, following the method outlined in the Allen Consulting Group (ACG) 2004 report. This will result in an allowance of 0.125% being incorporated into the cost of debt. This is consistent with the Guidelines. ATCO Gas Australia will also incorporate a hedging allowance of 0.025% into the cost of debt estimate. This allowance acknowledges the difficulty in hedging the exposure to movements of the risk free rate and is consistent with the Guidelines.

10.10.5 Conclusion on cost of debt

Based on the benchmark credit rating, cost of debt (6.94%), debt issuance (0.125%) and hedging costs (0.025%) set out above, the cost of debt which best meets the ARORO and NGO is 7.09%. This allowance will be updated prior to the ERA's final decision to reflect the time period agreed with the ERA.

ATCO Gas Australia's cost of debt estimate complies with rule 87, gives rise to the best estimate of the cost of debt which meets the ARORO, the NGO and the RPP. ATCO Gas Australia's adoption of the RBA's ten year BBB Australian corporate debt estimate reflects the costs likely to be incurred by a benchmark efficient financing strategy. The RBA's method is transparent, periodically updated and provided by a reputable and independent agency.

10.11 Imputation credits

Gamma is the factor used to account for the impact that the imputation tax system has on the WACC. The imputation tax system ensures that corporate profits are not taxed twice. Gamma is the product of two components, known as the distribution rate being the proportion of credit franking credits that are distributed to shareholders by attaching them to dividends and theta being the value to the relevant shareholder of each franking credit the is distributed to them.

10.11.1 NGR requirements

The requirements for the costs of corporate income tax are outlined in rule 87A of the NGR as follows:

261 RBA, F3 Aggregate Measures of Australian Corporate Bond Spreads and Yields: Non-financial Corporate (NFC) Bonds, published on www.rba.gov.au.

(1) The estimated cost of corporate income tax of a service provider for each regulatory year of an *access arrangement period* (ETC_t) is to be estimated in accordance with the following formula:

$ETC_t = (ETI_t \times r_t)(1 - \gamma)$

Where

ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider;

r_t is the expected statutory income tax rate for that regulatory year as determined by the AER; and

γ is the value of imputation credits.

Rule 74 of the NGR also requires that the estimate must be:

- arrived at on a reasonable basis; and
- represent the best estimate possible in the circumstances

10.11.2 Rate of Return Guidelines approach

In its Guidelines, the ERA proposes to estimate gamma as the product of the imputation credit distribution rate, *F,* and the value of distributed imputation credits, theta. ATCO Gas Australia agrees that the ERA's proposed use of a 70% distribution rate is the best estimate currently available. However, the ERA's estimate of theta proposed in the Guidelines is not reasonably based and is not the best estimate possible in the circumstances. The reasons for this are summarised below and presented in the expert report from SFG[262].

With respect to estimation of theta, the ERA reaches the following conclusion:

> *The Authority considers that dividend drop-off studies offer a key advantage in that they calculate an observed market value for franking credits The Authority therefore considers that the dividend drop-off methodology is the most appropriate methodology for estimating theta. However, dividend drop-off studies are known to suffer from a variety of estimation issues that result in the estimated value of theta being vulnerable to the dividend sample, parametric form of the regression equation and regression technique used. As a consequence the Authority is of the view that it is more appropriate to use a range of dividend drop-off studies.* [263]

The ERA considers two dividend drop-off estimates in determining the value of theta. The first estimate of 0.35 is derived from the SFG 2011 study, which was subsequently updated in 2013. The second estimate, a range of 0.35-0.55 is derived from the ERA's own 2013 study. Ultimately the ERA's final estimate of theta is derived from its range of 0.35-0.55.

The reason for the difference in theta estimate between the two studies can be attributed to an econometric assumption. In performing a dividend drop-off study, there is an estimate of the change in share price we would expect to observe if the stock did not go ex-dividend. The most common assumption is the expected change in share price is equal to the market

[262] Appendix 24: Estimating Gamma for ATCO Gas Australia, SFG, March 2014.

[263] ERA 2013 Explanatory Statement for the Rate of Return Guidelines, para. 920.

return, and this is the assumption incorporated in the analysis relied upon by ATCO Gas Australia. It was also an assumption required by the AER when the terms of reference were decided for the study performed for the Australian Competition Tribunal. The ERA presents results under this assumption, and also under the alternative assumption that the expected change in share price is equal to zero. The ERA conclusion reported above (θ = 0.45) is based upon the results that assume the expected return, in the absence of the stock trading ex-dividend, is equal to zero. As demonstrated by SFG[264], this is not a reasonable assumption.

ATCO Gas Australia submits this estimate of theta does not produce the best estimate of gamma which is consistent with the NGO and RPP. This is due to the ERA's disproportionate weighting of the SFG studies in favour of its own estimate of theta.

ATCO Gas Australia submits that the ERA's mid-point estimate from within its range of 0.35-0.45 is not the best estimate given the available information. As demonstrated by SFG[265]:

- The ERA's own estimates are below 0.45, and a significant proportion of those estimates are below 0.35
- The ERA study presents analysis that does not employ standard market adjustments
- The SFG (2013) estimates indicate that, if anything, the 0.35 estimate is towards the upper end of the reasonable range

10.11.3 ATCO Gas Australia's imputation credits proposal

ATCO Gas Australia proposes to base its estimate of theta on the SFG studies. The approach used by SFG has been subject to a high level of scrutiny from both regulators and the Australia Competition Tribunal[266]. The SFG method employs the standard approach of correcting prices for market movements over the ex-dividend day. Finally, theta estimates produced by the SFG approach have been shown to be stable and reliable in the face of stability and robustness checks.

ATCO Gas Australia proposes the value of imputation credits be set at 0.25, on the basis of a distribution rate of 0.70 and a value for a distributed credit of 0.35.

10.12 ATCO Gas Australia's proposed rate of return

ATCO submits that a return on equity of 10.7% and a return on debt of 7.09% generate a WACC of 8.53% which complies with the NGR and the ARORO, the NGO and the RPP.

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[264] Appendix 24: Estimating Gamma for ATCO Gas Australia, SFG, March 2014.

[265] Appendix 24: Estimating Gamma for ATCO Gas Australia, SFG, March 2014.

[266] Application by Energex Limited (Gamma) (No 5) [2011].

11. Total revenue

11.1 Key messages

- The total revenue requirement for the AA4 period is calculated to be $1.139 million
- ATCO Gas Australia has applied the building blocks methodology, including an estimate of the tax liability consistent with the NGR, to determine the total revenue in AA4. Revenue from ancillary services and prudent discounts is then deducted from the total revenue requirement in order to calculate the revenue to be collected through reference tariffs
- ATCO Gas Australia has implemented a number of changes to the assumptions in the revenue modelling for AA4 as a result of changes to the NGR. These are:
  - Retaining the current cost accounting (CCA) treatment of the opening capital base at 1 July 2014 and applying real straight line depreciation to the opening capital base;
  - Adopting historical cost accounting (HCA) and nominal straight line depreciation for capital additions during the AA4 period;
  - Including equity raising costs in revenue modelling for AA4, reflecting the reality that a benchmark firm may wish to raise equity to fund its investment program; and
  - Including an estimate of the tax liability consistent with new rule 87 of the NGR of $40.3 million.

11.2 Building block methodology

ATCO Gas Australia has applied the building blocks method to determine total revenue and prices over AA4. The building blocks method is prescribed in Rule 76 of the NGR and used by regulated businesses and economic regulators to determine the target revenue that meets the NGR's revenue and pricing principles.

In November 2012 the AEMC implemented changes to the NGR. One of the significant changes was to specify a post-tax revenue modelling framework. In order to comply with the new rules, it has been necessary for ATCO Gas Australia to introduce a tax building block into the calculation of total revenue.

Total revenue is determined for each regulatory year of the access arrangement period using the building block approach. The building blocks are:

- A return on the projected capital base for the year (as detailed in Chapter 9 The Capital Base);
- Depreciation on the projected capital base for the year (as detailed in Chapter 9 The Capital Base);
- The estimated cost of corporate income tax for the year (as detailed in this chapter);
- Increments or decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency (not relevant); and

- A forecast of operating expenditure for the year (as detailed in Chapter 6 Operating expenditure).

The building blocks of total revenue in each regulatory year of the current access arrangement period, and the total revenue in each year, are shown in Table 79.

Table 79: Total revenue building blocks for 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	TOTAL
Return on capital base	42.4	87.0	92.3	97.9	103.2	108.2	531.1
Return on working capital	0.1	0.2	0.2	0.2	0.2	0.3	1.2
Depreciation	4.8	14.4	18.5	22.0	25.1	28.1	113.0
Operating expenditure	39.3	78.8	80.5	82.7	85.5	87.0	453.8
Tax	2.0	5.4	5.9	7.7	9.4	10.0	40.3
Total	**88.6**	**185.8**	**197.4**	**210.4**	**223.5**	**233.6**	**1,139.4**

The return on the capital base, depreciation and operating expenditure building block estimates are discussed in Chapter 6 (Operating expenditure) and Chapter 9 (The Capital Base). This chapter presents the estimates of the tax and return on working capital building block. Also presented in the following sections is the forecast revenue to be received from ancillary services and prudent discounted haulage services, which is subtracted from the total revenue to determine the revenue to be collected through haulage reference tariffs.

11.2.1 Estimate of corporate income tax

Rule 76(c) requires an estimate of corporate income tax to form a building block for a distribution business's total revenue requirement. This requires ATCO Gas Australia to establish a tax asset base (TAB).

The AER has provided guidance for deriving an initial TAB for businesses transitioning into a post-tax regime, including a number of principles to guide the calculation. It is generally accepted regulatory practice in Australia for the tax asset base to, where possible, take into account the actual tax position of assets that constitute the regulatory asset base (RAB). The tax asset base is established by taking into account the following information:

- The date the business was first subject to tax (or the national tax equivalence regime)
- The tax value of assets at that date, in sufficient detail to distinguish RAB assets from non-RAB assets
- The vintage profile of the RAB assets when first subject to tax including any capital expenditure that took place prior to the commencement of regulation and
- The tax base established when first subject to tax can then be rolled forward to the commencement of the post-tax approach taking account of relevant tax depreciation provisions, actual capital expenditure and disposals

ATCO Gas Australia engaged Ernst & Young to assist with the implementation of the post-tax approach for determining the tax building block component of the total revenue requirement.

(a) Tax asset base

The tax estimate requires the establishment of a TAB to be used for the purposes of estimating the tax liability for the regulated business. ATCO Gas Australia engaged experts Ernst & Young to determine the most appropriate and reliable information to establish the tax asset base.[267] The tax asset base as at 30 June 2014 as calculated by Ernst & Young is $495.3 million (nominal). The tax asset base estimate excludes unregulated assets and land which is not depreciable for tax purposes.

Ernst & Young calculated the opening tax asset base at 30 June 2014 from:

- ATCO Gas Australia's fixed asset register as at 23 July 2003, including all contributed and gifted assets. The fixed asset register has been restated to 30 June 2000 by removal of accumulated depreciation and additions subsequent to that date.
- Additions and disposals for the periods ending 31 December 2000, 31 December 2001, 31 December 2002, 31 December 2003, 31 December 2004, 31 December 2005, 31 December 2006, 31 December 2007, 31 December 2008, 31 December 2009, 30 June 2010 and 30 June 2011, including all contributed and gifted assets.
- Forecast additions and disposals for the periods ending 30 June 2012, 30 June 2013 and 30 June 2014.
- Depreciation based on effective lives used for depreciation purposes using the prime cost method.

Ernst & Young's report outlining the method and value of the tax asset base is attached in[268].

(b) Tax depreciation

ATCO Gas Australia adopts the straight line (or prime cost) depreciation method for determining the tax asset base. The prime cost depreciation method is an election generally available under the provisions of the *Income Tax Assessment Act 1997* (ITAA97). This method simplifies the modelling of the tax asset base and is consistent with the accounting depreciation method.

The asset lives used for tax depreciation purposes are presented in the table below.

Table 80: Asset categories and tax lives for tax depreciation purposes

Asset category	Tax life for depreciation purposes
High pressure mains	20
Medium pressure mains	20
Medium/low pressure mains	20
Low pressure mains	20
Regulators	40
Secondary gate stations	40

[267] Appendix 26: Review of Regulated Tax Asset Base for Regulated revenue purposes, Ernst & Young, December 2013.
[268] Appendix 26: Review of Regulated Tax Asset Base for Regulated revenue purposes, Ernst & Young, December 2013.

Asset category	Tax life for depreciation purposes
Buildings	100
Meter and services pipes	15
Equipment and vehicles	20
Information technology	4
Full retail contestability	20
Land	-

11.2.2 Estimate of tax

ATCO Gas Australia's TAB was $328.1 million ($ nominal) as at 30 June 2000. Its tax asset base has been rolled forward from 30 June 2000 to 30 June 2014 using actual and estimated capital contributions and disposals. All conforming capital expenditure that contributes to the forecast capital asset base has been incorporated into the roll forward of the TAB.

ATCO Gas Australia submits a TAB value of $497.5 million ($ nominal) for the start of the AA4 period.

For the AA4 period ATCO Gas Australia has rolled forward the tax asset base from 1 July 2014 to 31 December 2019 by:

- Adding all capital expenditure, including contributed and gifted assets, on an as-incurred basis
- Deducting the depreciation based on the applicable effective tax lives calculated on a straight-line basis

The table below presents the calculation of the TAB to 31 December 2019.

Table 81: Components of tax asset base: 2014 to 2019[269]

$ million Nominal at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	TOTAL
Opening TAB	497.5	516.2	571.2	631.5	695.7	762.4	
Forecast capital expenditure	43.7	108.9	120.6	126.6	130.7	136.2	666.7
Straight-line depreciation	25.0	53.9	60.3	62.4	64.0	70.3	335.9
Closing TAB	**516.2**	**571.2**	**631.5**	**695.7**	**762.4**	**828.3**	**828.3**

ATCO Gas Australia has calculated the tax building block in accordance with Rule 87A.

The estimated cost of corporate income tax of a service provider for each regulatory year of an access arrangement period (ETCt) is to be estimated in accordance with the following formula:

[269] This table is presented in Nominal dollars for tax purposes.

$$ETCt = (ETIt \times rt)\ (1 - \gamma)$$

Where

ETIt is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider;

rt is the expected statutory income tax rate for that regulatory year as determined by the AER; and

γ is the value of imputation credits.

Taxable income is determined as assessable income less costs recognised by the Australian Tax Office (ATO) as tax deductions. Tax deductible costs include operating expenditure, tax depreciation and debt servicing costs such as interest.

ATCO Gas Australia's tax asset base is rolled forward over the AA4 period, based on the remaining life of the opening tax asset base and the tax lives of the various capital assets. Tax depreciation is generally based on shorter lives than those used for regulatory depreciation. The tax lives used by ATCO Gas Australia are consistent with those approved by the ATO[270].

Depreciation rates are regulated asset depreciation rates. The rationale for this method is that the historical cost of these assets is the amount the asset owner has to fund. Capital has been returned, reducing the amount to be funded, at the regulatory depreciation rates.

Annual interest costs have been calculated based on an assumption that the opening debt balance for each year over the regulatory period is 60% of the historical cost written down value (WDV) value of regulated assets. This assumption is consistent with the benchmark level of gearing in the weighted average cost of capital (WACC).

The interest rate applied to the opening debt balance is consistent with the nominal cost of debt applied in the WACC.

Tax payable is calculated from regulated revenue plus capital contributions less costs multiplied by the corporate tax rate (30%). Any estimated tax losses are carried forward to offset against taxable income. Tax payable is then reduced by the amount of imputation credits.

Consistent with rule 76(c), ATCO Gas Australia proposes a corporate income tax building block as set out in Table 82.

Table 82: Tax building block 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Tax allowance	2.0	5.4	5.9	7.7	9.4	10.0	40.4

[270] Appendix 26: Review of Regulated Tax Asset Base for Regulated revenue purposes, Ernst & Young, December 2013.

11.2.3 Working capital

Working capital refers to the stock of funds a business must maintain to pay costs as they fall due. The cost arises as a result of the misalignment (on average) between incurring the costs of providing services and recovering the revenues associated with the provision of those services. The cost of this stock of working capital reflects the return on the capital funds required to be maintained. These costs represent the efficient costs of a business that receives revenue at a different time to when it incurs costs.

ATCO Gas Australia has estimated the cost of capital using the working capital cycle model as previously accepted by the ERA for Western Power[271]. The working capital allowance is calculated as the difference between the implicit cost incurred by providing credit to users of the service and the implicit benefit of receiving credit from suppliers. The working capital cycle is made up of three core components:

- Inventory
- Accounts payable (payments due to suppliers; creditor payments)
- Accounts receivable (cash due from customers; debtor collection)

Table 83 shows the working capital cycle model assumptions.

Table 83: Working capital allowance assumptions

Working capital		Comment
Inventory as a % of capex	0.89%	Determined from the average level of inventory as a percentage of the forecast capital expenditure program. This measure does not include work in progress or completed assets not yet added to the RAB The use of this measure is consistent with the ERA's Final Decision for Western Power[272]
Creditors	-15 days	Determined from the standard terms of payment The use of this measure is consistent with the ERA's Final Decision for Western Power[273]
Receivables	18 days	Determined from the meter reading cycles and payment terms of our contracts. The use of this measure is consistent with the ERA's Final Decision for Western Power[274]

Table 84 sets out the working capital allowance based on the above assumptions.

[271] ERA Final Decision for Western Power 5 September 2012 pg 252.

[272] ERA Final Decision for Western Power 5 September 2012 pg 252.

[273] ERA Final Decision for Western Power 5 September 2012 pg 252.

[274] ERA Final Decision for Western Power 5 September 2012 pg 252.

Table 84: Working capital allowance forecast: 2014 to 2019

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Working capital allowance	0.1	0.2	0.2	0.2	0.2	0.2	1.1

The working capital allowance reflects efficient cash flow management practices and takes in to account:

- The bi-monthly billing cycle for gas throughput which is equivalent to payment terms of ten days
- That labour costs are paid monthly, two weeks in arrears and two weeks in advance; and
- That payment for materials is made in 30 days as stipulated in contracts with suppliers and is representative of the payment terms available in the industry

11.3 Ancillary services

In the current access arrangement period, ATCO Gas Australia incorporated five ancillary services into its reference service revenue. Revenue from the following ancillary services is deducted from total revenue to arrive at the amount of revenue to be derived from reference haulage services:

- **Apply meter lock service** – where a lock is applied to a valve that comprises part of the delivery facility to prevent gas from being received at the relevant delivery point. This service is requested by retailers for reference service B3 customers
- **Remove meter lock service** – where a lock that was applied to a valve to prevent gas from being received at the relevant delivery point is removed. This service is requested by retailers for reference service B3 customers
- **Deregistration service** – where a delivery point is permanently deregistered by removing the delivery facility, removing the delivery point and removing the delivery point from the delivery point register. This service is requested by retailers for all reference service customers
- **Disconnection service** – where a delivery point is physically disconnected and thus prevents gas from being delivered to the delivery point. This service is requested by retailers for B2 or B3 customers
- **Reconnection service** – where the delivery point is reconnected to allow gas to be delivered to the delivery point. This service is requested by retailers for B2 or B3 customers

The forecast costs and demand for these services is provided in Chapter 12 (Reference Tariffs). The forecast revenue from ancillary reference services is provided in the table 85.

Table 85: Forecast revenue from ancillary services 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Apply meter lock	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Remove meter lock	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Deregistration	0.2	0.2	0.2	0.2	0.2	0.3	1.4
Disconnection	0.1	0.1	0.1	0.1	0.1	0.1	0.7
Reconnection	0.1	0.1	0.2	0.2	0.2	0.2	0.9
Total ancillary reference service revenue	**0.4**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**3.9**

11.4 Prudent discounts

Revenue forecast to be received from customers receiving prudent discounts in AA4 is presented in the table below. Further discussion on the forecast customers and volumes is provided in Chapter 12 (Reference Tariffs).

Table 86: Forecast revenue from customers receiving prudent discounts: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Revenue	0.7	1.4	0.8	0.6	0.6	0.6	4.7

11.5 Non-reference services

ATCO Gas Australia is negotiates the commercial terms and conditions, including prices, for non-reference services, which might be sought by prospective users.

These non-reference services include services providing for, or facilitating, the interconnection of pipelines. Revenue recovered from these services reflects the costs of providing these services.

This is the same approach that was applied to non-reference services in the current access arrangement period. The ERA is not required to approve tariffs or charges for non-reference services as the associated forecast costs for providing these services are not included in the costs used to calculate total revenue.

11.6 Revenue modelling

ATCO Gas Australia has determined the total revenue in each year of AA4 with reference to the building blocks method as described above. Ancillary service and prudent discount revenue is then subtracted from the total revenue requirement to determine the total revenue to be recovered from haulage reference services at reference tariffs. The revenue modelling is undertaken on a nominal post-tax basis as required under Rule 87(4)(b) and an end-of-year timing for modelling revenues, expenses and present value calculations

Utilising the total revenue derived from the building block method, ATCO Gas Australia has then specified price paths for its reference services to smooth its required revenue for the Haulage Reference Services and achieve price stability over the access arrangement period. In order to achieve this stability, the price paths have been designed so that approximately the same change in price occurs each year.

Based on the cost allocation to the haulage reference services, ATCO Gas Australia has solved for a price path that aligns the net present value of its five and a half year cost of service with the NPV of its forecast revenues. ATCO Gas Australia has adopted this price path having specific regard to cash flow requirements necessary to support prudent operation of the network and the long term interests of customers.

The smoothing gives rise to the revenue path set out in Table 87.

Table 87: Revenue requirement for 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Haulage revenue requirement – unsmoothed	87.4	183.8	195.9	209.2	222.2	232.2
Haulage revenue requirement - smoothed	97.5	185.0	194.9	205.7	216.7	228.4

Table 88 details the revenue to be recovered from each tariff class, including customers with prudent discounts. The total revenue recovered from all tariffs reconciles to the smoothed revenue requirement expected from haulage reference services.

Table 88: Revenue to be recovered by haulage reference tariff for 2014 to 2019

$ million real at 30 June 2014	2014	2015	2016	2017	2018	2019	Total
A1	8.0	8.3	9.0	9.8	10.1	10.5	55.7
A2	6.7	7.4	8.0	8.7	9.4	10.2	50.4
B1	9.9	10.5	11.0	11.6	12.3	13.1	68.3
B2	10.5	11.0	11.5	12.1	12.7	13.4	71.2
B3	146.7	147.9	155.4	163.5	172.2	181.2	966.9
Total	**181.9**	**185.0**	**194.9**	**205.7**	**216.7**	**228.4**	**1,212.5**

12. Reference Tariffs

12.1 Key messages

- ATCO Gas Australia proposes that the AA3 tariff classes continue into AA4 with the same charging parameters
- ATCO Gas Australia proposes an increase to the standing charge for B3 customers to cover the avoidable net present cost of connection over 25 years
- The real average annual increase across all reference tariffs is 1.6%
- The impact on an average B3 customer will be a 2.0% real increase in the annual network charge each year. Assuming the network charges represent approximately half of the retail charges to B3 customers, the impact on the retail tariffs is anticipated to be 1.0%
- The proposed tariff variation mechanism has been varied for B2 and B3 customers to provide a revenue yield per customer rather than a weighted average price cap as applied in AA3
    - This change means B2 and B3 reference tariffs will increase by more than forecast if consumption per customer declines (compared to forecast) and prices will decrease if consumption per customer increases
- The pass through arrangements that existed in AA3, for example, for costs associated with changes in regulation and legislation, will remain but be extended to include unforeseeable cost increases related to performing any existing regulatory obligation and increases in the costs of licences and fees (previously included in the tariff variation formula)

12.2 National Gas Rule requirements

Rule 92 of the National Gas Rules provides that:

1) *A full access arrangement must include a mechanism (a reference tariff variation mechanism) for variation of a reference tariff over the course of an access arrangement period.*

2) *The reference tariff variation mechanism must be designed to equalise (in terms of present values):*

    a) *forecast revenue from reference services over the access arrangement period; and*

    b) *the portion of total revenue allocated to reference services for the access arrangement period.*

3) *However, if there is an interval (the interval of delay) between a revision commencement date stated in a full access arrangement and the date on which revisions to the access arrangement actually commence:*

    a) *reference tariffs, as in force at the end of the previous access arrangement period, continue without variation for the interval of delay; but*

b) *the operation of this sub rule may be taken into account in fixing reference tariffs for the new access arrangement period.*

Rule 93 outlines the requirements in relation to the allocation of total revenue and costs between reference and other services.

1) *Total revenue is to be allocated between reference and other services in the ratio in which costs are allocated between reference and other services*

2) *Costs are to be allocated between reference and other services as follows:*

   a) *costs directly attributable to reference services are to be allocated to those services; and*

   b) *costs directly attributable to pipeline services that are not reference services are to be allocated to those services; and*

   c) *other costs are to be allocated between reference and other services on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the ERA*

Rule 94 outlines the requirements in relation to reference tariffs:

1) *For the purpose of determining reference tariffs, customers for reference services provided by means of a distribution pipeline must be divided into tariff classes*

2) *A tariff class must be constituted with regard to:*

   a) *the need to group customers for reference services together on an economically efficient basis; and*

   b) *the need to avoid unnecessary transaction costs*

3) *For each tariff class, the revenue expected to be recovered should lie on or between:*

   a) *an upper bound representing the stand alone cost of providing the reference service to customers who belong to that class; and*

   b) *a lower bound representing the avoidable cost of not providing the reference service to those customers*

4) *A tariff, and if it consists of 2 or more charging parameters, each charging parameter for a tariff class:*

   a) *must take into account the long run marginal cost for the reference service or, in the case of a charging parameter, for the element of the service to which the charging parameter relates;*

   b) *must be determined having regard to:*

      (i) *transaction costs associated with the tariff or each charging parameter; and*

      (ii) *whether customers belonging to the relevant tariff class are able or likely to respond to price signals*

5) *If, however, as a result of the operation of sub rule (4), the service provider may not recover the expected revenue, the tariffs must be adjusted to ensure recovery of expected revenue with minimum distortion to efficient patterns of consumption.*

6) *The ERA's discretion under this rule is limited*

ATCO Gas Australia also provides prudent discounts to some customers of Reference Services. This is provided for under Rule 96 of the NGR as follows:

1) *Despite the other provisions of this Division, the AER may, on application by a service provider, approve a discount for a particular user or prospective user or a particular class of users or prospective users*

2) *The ERA may only approve a discount under this rule if satisfied that:*

   a) *the discount is necessary to:*

      (i) *respond to competition from other providers of pipeline services or other sources of energy; or*

      (ii) *maintain efficient use of the pipeline; and*

   b) *the provision of the discount is likely to lead to reference or equivalent tariffs lower than they would otherwise have been*

3) *If the ERA approves a discount under this rule, the ERA may also approve allocation of the cost, or part of the cost, of providing the discount to the costs of providing a reference or other service in one or more future access arrangement periods*

4) *In this rule equivalent Tariff means the tariff that is likely to have been set for a service that is not a reference service if the service had been a reference service*

Rule 97 of the national gas rules outlines the mechanics of the reference tariff variation.

1) *A reference tariff variation mechanism may provide for variation of a reference tariff:*

   a) *in accordance with a schedule of fixed tariffs; or*

   b) *in accordance with a formula set out in the access arrangement; or*

   c) *as a result of a cost pass through for a defined event (such as a cost pass through for a particular tax); or*

   d) *by the combined operation of 2 or more or the above*

2) *A formula for variation of a reference tariff may (for example) provide for:*

   a) *variable caps on the revenue to be derived from a particular combination of reference services; or*

   b) *tariff basket price control; or*

   c) *revenue yield control; or*

   d) *a combination of all or any of the above*

3) *In deciding whether a particular reference tariff variation mechanism is appropriate to a particular access arrangement, the ERA must have regard to:*

   a) *the need for efficient tariff structures; and*

   b) *the possible effects of the reference tariff variation mechanism on administrative costs of the ERA, the service provider, and users or potential users; and* *c) the regulatory arrangements (if any) applicable to the relevant reference services before the commencement of the proposed reference tariff variation mechanism; and*

d) the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction); and

e) any other relevant factor

4) A reference tariff variation mechanism must give the ERA adequate oversight or powers of approval over variation of the reference tariff

5) Except as provided by a reference tariff variation mechanism, a reference tariff is not to vary during the course of an access arrangement period

12.3 Reference Tariffs

Rule 94 of the NGR outlines the requirements in relation to tariff classes and the revenue to be recovered from each tariff class. It also outlines the requirements in relation to charging parameters.

The reference tariff classes in AA4 are the same as those in AA3. Tariff classes are defined by the type of delivery facilities to be provided. By grouping customers according to the delivery facilities, required tariffs can be constructed to reflect the costs related to serving that tariff class and provide appropriate price signals. The five tariff classes achieve a balance between grouping customers together on an economically efficient basis and avoiding unnecessary transaction costs associated with a multitude of tariff classes.

Each tariff class and the facilities utilised are discussed in the following sections.

12.3.1 Tariff class A1

A customer in Tariff class A1:

- is reasonably expected to take delivery of 35 TJ or more of gas during each year of the haulage contract; and
- is reasonably expected to require a contracted peak rate of 10 GJ or more per hour; and
- is likely to require user specific delivery facilities

There are approximately 70 A1 Reference Tariff customers that require gas to be supplied at high or medium pressures (above 300 kPa). These customers require gas delivery to specific delivery facilities to supply gas into their plant and equipment. The specific delivery facilities must be designed and constructed to accommodate the peak flows of 10 GJ/hour or more and allow remote monitoring using telemetry as required by the Retail Market Rules.

There are no changes proposed to the tariff structure or charging component for these customers.

12.3.2 Tariff Class A2

A customer in Tariff class A2:

- is reasonably expected to take delivery of 10 TJ or more of gas, but less than 35 TJ of gas, during each year of the haulage contract, and/or is reasonably expected to require a contracted peak rate of less than 10 GJ per hour or an Above 10 TJ (a determination of using more than 10 TJ has been or is likely to be made under the Retail Market Rules); and

- is likely to request user specific delivery facilities.

There are approximately 110 A2 customers. These customers require haulage service through the high pressure and medium pressure systems and user specific delivery facilities. The specific delivery facilities must be designed and constructed to accommodate the peak flows of at most 10 GJ/hour and allow remote monitoring using telemetry as required by the Retail Market Rules.

There are no changes proposed to the tariff structure or charging component for these customers.

12.3.3 Tariff Class B1

There are approximately 1,400 B1 tariff customers. These customers are reasonably expected to take delivery of less than 10 TJ of gas during each year or request a contracted peak rate of less than 10 GJ per hour. They may also request user specific delivery facilities.

There are no changes proposed to the tariff structure or charging component for these customers.

12.3.4 Tariff Class B2

There are approximately 10,000 B2 tariff customers. These customers use the medium and low pressure system and are provided service through a standard 12 m3/hr meter utilising up to 20 meters of service pipe and a standard regulator. These customers are generally small industrial and commercial customers but also include larger residential customers.

There are no changes proposed to the tariff structure or charging component for these customers.

12.3.5 Tariff Class B3

The majority of customers are in the B3 tariff class (more than 670,000). These customers receive service through standard delivery facilities and utilise the medium and low pressure system and less than 20 meters of service pipe. These customers are mostly residential, but can also include smaller commercial customers.

Currently, these customers utilise a standard 8m3/hour meter (AL8)[275]. In AA4, ATCO Gas Australia proposes to include a larger 10m3/hour meter (AL10) in the standard delivery facilities for these customers. This is discussed further in Chapter 4 (Services to be provided).

12.4 Reference Tariff charging parameters

Rule 94 requires that each charging parameter, where there are two or more charging parameters, must take account of the long run marginal costs for the service, transaction costs and whether customers are able to respond to price signals.

[275] Some existing customers also utilise a 6m3/hour meter (AL6).

ATCO Gas Australia does not propose to change the charging parameters for reference tariffs in AA4 because the charging parameters already provide reasonable signals to customers about the additional costs associated with additional service elements.

The majority of ATCO Gas Australia's costs and long run marginal costs are fixed and driven by the pressure, length and capacity (number of GJs able to flow through the particular pipe at a point in time) required. Very few costs are impacted by the amount of gas consumed over a longer period of time. Ideally, a much greater proportion of revenue would be recovered through fixed charges. During AA3, the standing charges of all tariff classes were adjusted to increase the proportion of long run marginal costs recovered through fixed charges.

Reference tariffs include different charging parameters for different service elements. Each reference tariff consists of a number of charging parameter that reflect the different service element. All reference tariffs include a fixed standing charge and a variable usage charge. In addition to the standing charge and usage charge, Reference tariff A1 has a demand charge based on the distance from the nearest transmission pipeline and maximum hourly peak flow requirements designed in order to reflect the additional costs of providing network infrastructure to supply high pressure gas at peak flow rates. The reference tariff A1 usage charge is also adjusted according to the distance the gas is hauled from the transmission pipeline to the delivery point to reflect the amount of the network infrastructure utilised by A1 customers. Tariffs classes A1, A2 and B1 also include user specific delivery facility charges.

The reference tariff structure and charging parameters will remain the same in AA4 and are presented in the table below.

Table 89: Reference Service Tariff Class, service element and charging parameters

Reference service Tariff	Service element	Charging parameter
A1	Fixed charge for using the distribution system	Standing Charge ($/year)
	A fixed charge for the capacity of network utilised (reflecting maximum hourly quantity)	Demand Charge ($/MHQ GJ/km)
	A variable charge based on throughput	Usage Charge ($/GJ/km)
	Charge to reflect the specific costs associated with customer for service pipe, regulators, metering and telemetry	User specific Charge ($)
A2	Fixed charge for using the distribution system	Standing Charge ($/year)
	A variable charge based on throughput	Usage Charge ($/GJ)
	Charge to reflect the specific costs associated with customer for service pipe, regulators, metering and telemetry	User specific Charge ($)
B1	Fixed charge for using the distribution system	Standing Charge ($/year)
	A variable charge based on throughput	Usage Charge ($/GJ)
	Charge to reflect the specific costs associated with customer for service pipe, regulators, metering and telemetry	User specific Charge ($)

Reference service Tariff	Service element	Charging parameter
B2	Fixed charge for using the distribution system A variable charge based on throughput	Standing Charge ($/year) Usage Charge ($/GJ)
B3	Fixed charge for using the distribution system A variable charge based on throughput	Standing Charge ($/year) Usage Charge ($/GJ)

12.5 Adjustments to the standing charges for B3 Reference Tariff customers

ATCO Gas Australia proposes to increase the fixed charge associated with B3 reference tariff customers. The increase will incorporate the avoidable costs of connecting B3 reference tariff customers over the 25 year life of the assets required for a standard connection.

The avoidable cost of connection is the net present value of the costs of a standard meter, a standard regulator and a standard length of service pipe. If customers do not cover their avoidable costs, they are being subsidised by other customers in the tariff class. In order to reduce the potential impact of these costs to low consumption customers, 2 GJ of gas will also be included in the standing charge.

The change to the standing charge will ensure that the charges cover the avoidable costs associated with B3 customers and provide efficient price signals to new customers. It will also help to ensure the connection of a new customer does not result in existing customers incurring additional costs.

The increase in the standing charge is accompanied by a reduction in the usage charge to retain the proportion of revenue to be recovered from B3 customers, benefitting B3 customers with higher consumption.

12.5.1 National Gas Access (WA) (Local Provisions) Regulations

Under the *National Gas Access (WA) (Local Provisions) Regulations*, the ERA must consider the impact on small use customers and retailers when making an access arrangement for a distribution pipeline. Small use customers are those that use less than 1 TJ in any year.

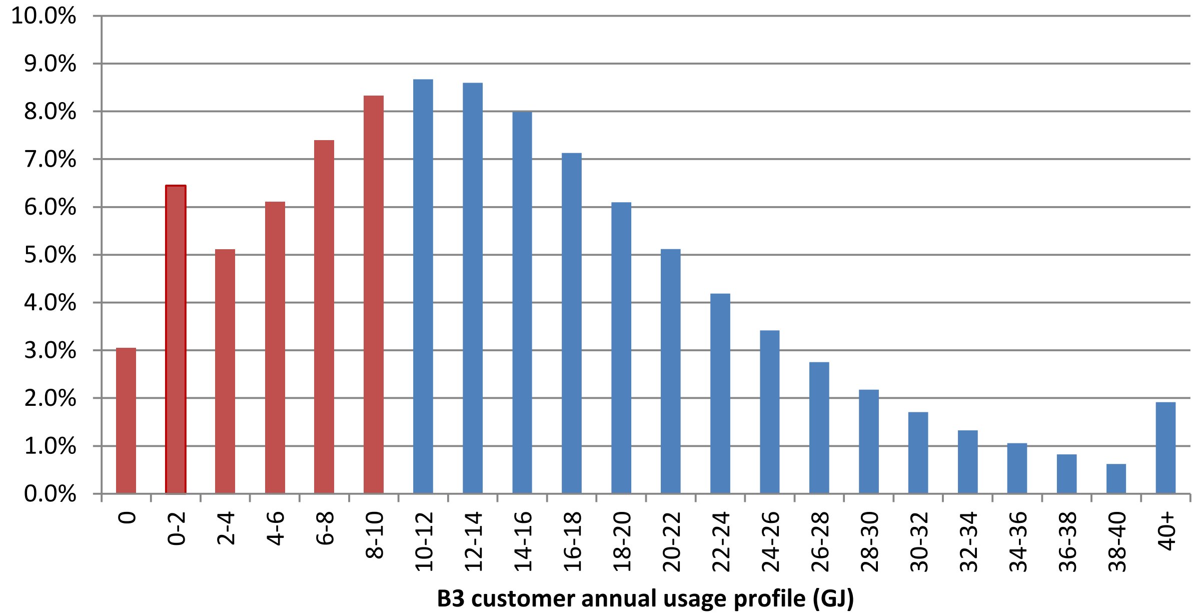
Small use customers covered under this provision are in the B3, B2 and B1 reference tariff classes. The majority of small use customers fall under the B3 reference tariff. The analysis presented in this section is based on B3 customers only as they are the smallest customers that will experience adverse price impact.

The anticipated impact on customers that use more than 10 GJ per year is a price decrease in the first year that the proposed reference tariffs are effective, followed by an average annual tariff increase for the remaining years of AA4. The average annual tariff increase to B1, B2 and B3 reference tariff customers is 3.4%, 4.7% and 2.0%, respectively.

ATCO Gas Australia recognises that the actual impact on customers will depend on any changes that the retailers make to their charges to reflect the changes in the network charge. When examining the price impacts on customers, the analysis assumes the change to the reference tariff is passed directly through to the individual customers. The impact on retailers will be as per the average annual tariff increases as outlined above. ATCO Gas Australia has not sought information on the consumption profile of the customers of each retailer.

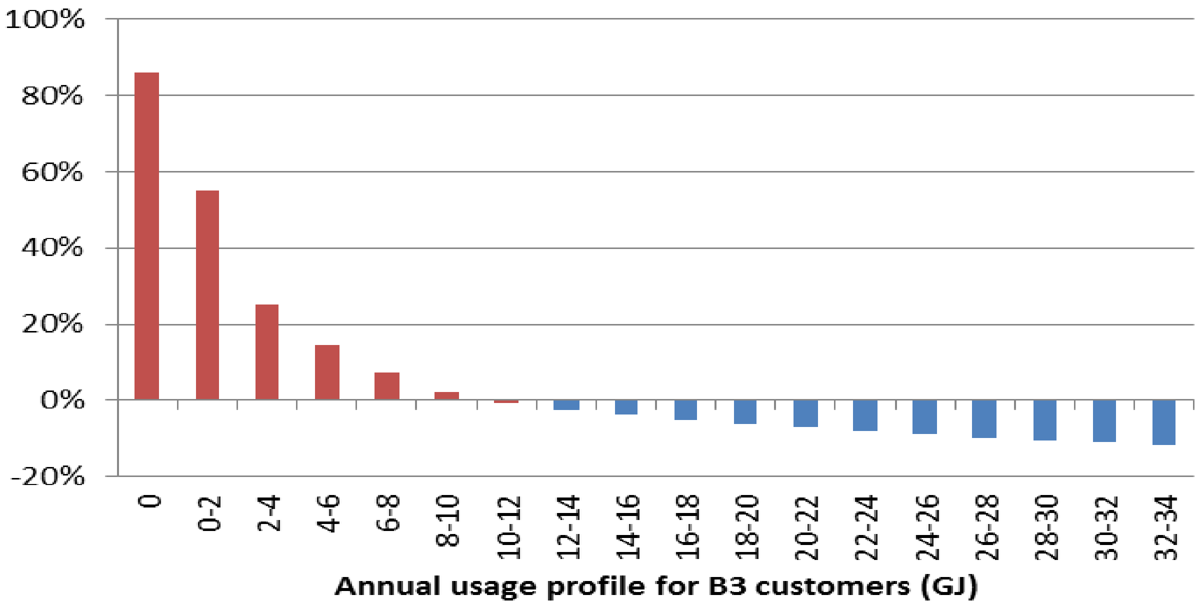
Figure 87 shows the percentage of B3 customers by annual consumption based on the consumption profile in 2013.

Figure 87: Distribution of annual consumption of B3 customers in 2013



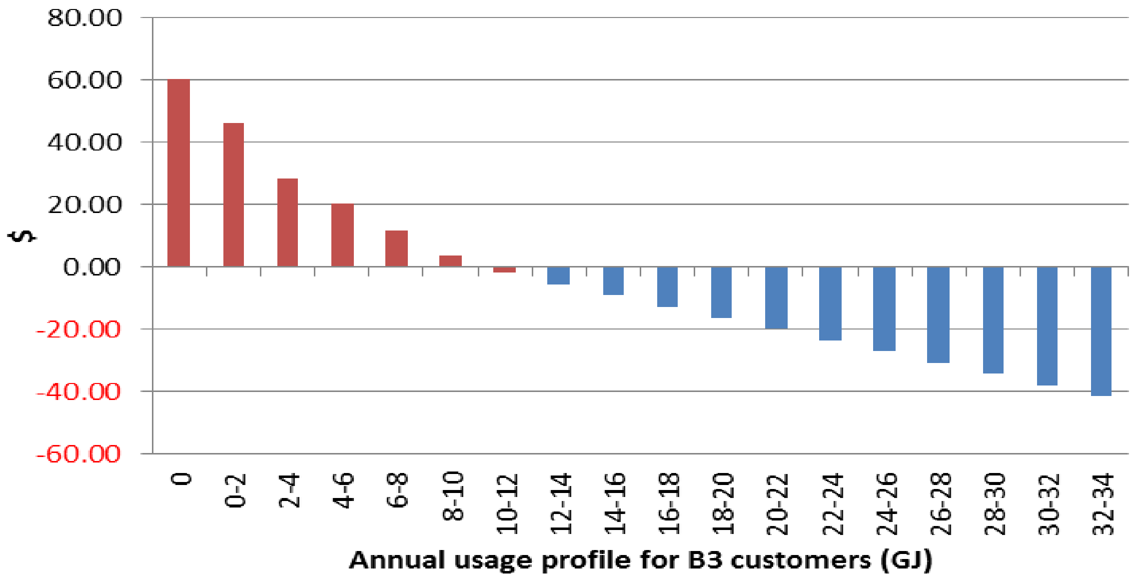
The price impacts on a B3 customer of moving from the current reference tariff to the proposed reference tariffs for the AA4 period (assumed to be effective from 1 January 2015) are presented in the following chart (based on the profile of consumption recorded in 2013). The price impacts to B3 customers range from increases of just over 86% to decreases greater than 12%.

Figure 88: Percentage price impact on B3 customers



For those customers that use little to no gas, the price increase will directly reflect the change in the standing charge and therefore, in effect, be subject to the greatest price increase. Figure 89 illustrates the increase in the annual network charge to a B3 customer based on consumption. The largest annual network bill increase is $60, which is the difference between the current annual standing charge and the new annual standing charge.

Figure 89: Increase in annual network charges to B3 customers based on consumption



Based on 2013 usage patterns, 60% of B3 customers will face decreases in the network tariff component of their gas bill and 40% will face increases when the proposed reference tariffs for AA4 come into effect. The customers that will experience increases are those that are using less than 11 GJ per year. Over the remaining AA4 period, the tariff impacts will reflect the average annual tariff impact of 2.0%.

Customers that use less than 8 GJ per year may experience price increases of more than 7% or $12 in 2015. A large proportion of these customers (up to 50%) are recent connections. ATCO Gas Australia has identified that it can take up to three years for a customer's normal consumption patterns to be reflected in the consumption data. This is due to the fact that recently connected customers are transitioning to their normal usage patterns and will therefore experience the new charges for the first time rather than experience an increase in charges.

To help offset the impact to the lowest use customers, ATCO Gas Australia is pursuing targeted marketing in order to create awareness around natural gas and encourage the use of gas appliances. Where this is successful in substituting other energy use, customers may be able to reduce their total energy bill.

12.6 Total revenue to be recovered from reference tariffs

Total revenue to be recovered from the provision of reference services has been determined to be consistent with National Gas Rules 76 and 93. Chapter 11 (Total revenue) which outlines the calculation of total revenue in compliance with rule 76.

The Mid-West and South-West Gas Distribution System (the Network) provides haulage reference services and ancillary services which can apply to reference and non-reference services. Rule 93 requires total revenue allocated between services to be based on the ratio in which costs are allocated between reference and other services. The costs of providing ancillary services are recovered directly from the customers receiving those services through charges for the services. Therefore, in order to allocate the total revenue to be recovered from reference services, ATCO Gas Australia has subtracted the revenue forecast to be received from ancillary services from the total revenue.

The total revenue to be recovered from reference tariffs excludes revenue from customers on discounted reference tariffs and revenue received from ancillary service charges.

12.6.1 Revenue from customers on discounted reference tariffs

Revenue from customers receiving prudent discounts is subtracted from the total revenue requirement. ATCO Gas Australia forecasts $4.7 million in revenue from customers receiving prudent discounts during AA4. The revenue from prudent discounts for the AA4 period is forecast to reduce over the period 2015 - 2019 from $1.4 million to $0.6 million per year.

Forecast revenues resulting from the provision of reference haulage services at discounted tariffs are set out in the table below.

Table 90: Forecast revenue from customers receiving prudent discounts: 2014 to 2019

$ million real at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Revenue	0.7	1.4	0.8	0.8	0.6	0.6	4.7

If a customer receives reference service but pays an amount less than the relevant reference tariff, that discount is said to be a prudent discount. The approval of a discount for a particular user or a particular class of users or prospective users is allowable under r 96 of the NGR. In particular, r 96(2) provides:

> *The [ERA] may only approve a discount under this rule if satisfied that:*
>
> *the discount is necessary to:*
>
> *(i) respond to competition from other providers of pipeline services or other sources of energy; or*
>
> *(ii) maintain efficient use of the pipeline; and*
>
> *the provision of the discount is likely to lead to reference or equivalent tariffs lower than they would otherwise have been.*

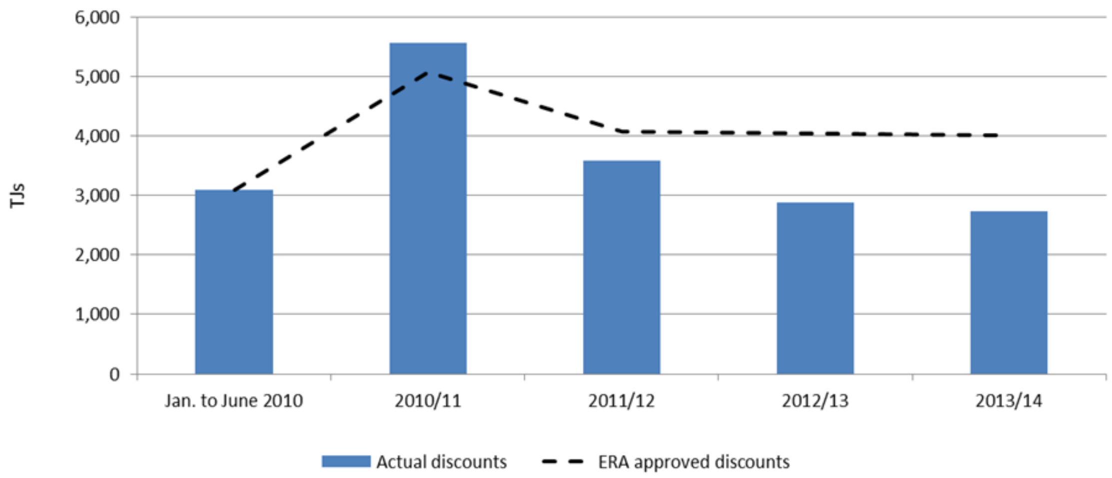
Prudent discounts have been offered on the Network since the introduction of the first access arrangement. Prudent discounts were offered to recognise haulage tariffs that existed at the time may have been based on a different pricing mechanism established under the *Gas Distribution Regulations 1998* and to mitigate the impact of moving from one charging regime to another.

Since the introduction of the NGL, prudent discounts can only be approved where the discounts are consistent with rule 96 of the NGR. In AA3 the ERA was satisfied the prudent discounts promoted efficient use of the pipeline under rule 96(2)(ii) because the discounts provided non-reference haulage revenue that exceeded the avoidable costs of supply.

The ERA was also satisfied the prudent discounts led to reference tariffs that were lower than they otherwise would have been because the revenue received from the continuation of supply to these customers reduced the amount that other customers needed to pay to cover the fixed costs. The actual discounts provided over AA3 was less than forecast as customers transferred to reference tariffs when renewing contracts.

Figure 90 shows the forecast volumes subject to a discount during AA3 compared to the actual volume.

Figure 90: Forecast volumes resulting from discounted tariffs compared to actual volume 2010 to 2014



Forecast prudent discount volumes and actual prudent discount volumes from AA3 are presented in the table below.

Table 91: Actual and forecast volumes delivered to customers receiving discounted tariffs for 2010 to 2014

(TJs)	Forecast	Actuals	Variance
Tariff class A1	19,729	17,493	(2,236)
Tariff class A2	541	328	(213)
Tariff class B1	15	4	(11)
Tariff class B2	9	5	(4)
Total volume	**20,294**	**17,831**	**(2,464)**

ATCO Gas Australia forecasts no additional prudent discounts for the AA4 period. The remaining customers receiving prudent discounts have been assessed as continuing to meet the criteria for the application of a discount. However, the number of customers receiving a discount will decrease from 14 to 11 over AA4 as each customer's entitlement to a prudent discount is assessed at their contractual review date. Each customer is reviewed on a case-by-case basis and some connections will be offered a continuing discount due to the proximity of the customer to other sources of natural gas. ATCO Gas Australia submits that the discounts forecast to be provided to customers during AA4 continue to be consistent with Rule 96.

Table 92 presents the forecast number of customers to continue to receive prudent discounts and the forecast volumes delivered to those customers.

Table 92: Forecast number of customers and volumes receiving a prudent discount to the Reference Tariff

	July to Dec 2014	2015	2016	2017	2018	2019
Number of customers (Average for the period)	14	14	12	11	11	11
Volumes (TJs)	1,370	2,752	2,223	2,116	2,168	2,226

In all cases where physical bypass is a potential issue, ATCO Gas Australia considers the following as part of its calculations:

- the total engineering cost of constructing a bypass pipeline using a physical route;
- the potential cost of facilities required to interconnect to the nearest transmission pipeline
- the minimum meter set and telemetry requirements for the delivery point; and
- the Non-avoidable operating and maintenance costs

If ATCO Gas Australia determines a customer no longer meets the conditions for a discount as allowed by rule 96 of the NGR, the customer will be placed on a price path that gradually increases to the reference tariff.

Table 93 presents the calculation of the net present value of revenue to be recovered through reference tariffs.

Table 93: Revenue to be recovered through haulage reference tariffs

Revenue component	$m present value
Total revenue calculated under Rule 76	943.0
Revenue to be received from ancillary services	3.2
Revenue to be received from customers receiving prudent discounts	4.0
Revenue to be recovered through reference tariffs	**935.7**

12.6.2 Total revenue to be recovered from Ancillary Services

During AA4, ATCO Gas Australia will continue offering the same ancillary reference services that apply in AA3. These are:

- **Apply meter lock service** – where a lock is applied to a valve that comprises part of the delivery facility to prevent gas from being received at the relevant delivery point. This service is requested by retailers for reference service B3 customers
- **Remove meter lock service** – where a lock that was applied to a valve to prevent gas from being received at the relevant delivery point is removed. This service is requested by retailers for reference service B3 customers
- **Deregistration service** – where a delivery point is permanently deregistered by removing the delivery facility, removing the delivery point and removing the delivery point from the delivery point register. This service is requested by retailers for all reference service customers
- **Disconnection service** – where a delivery point is physically disconnected and thus prevents gas from being delivered to the delivery point. This service is requested by retailers for B2 or B3 customers.
- **Reconnection service** – where the delivery point is reconnected to allow gas to be delivered to the delivery point. This service is requested by retailers for B2 or B3 customers

Ancillary services tariffs are calculated on a cost recovery basis as the best estimate of long run marginal cost. Ancillary services have been costed on a per unit of activity basis. The charges are presented in the following table.

Table 94: Ancillary service charges: 2014 to 2019

Charging parameter (real 2014$)	Units	2014	2015	2016	2017	2018	2019
Apply Meter Lock	$/activity	54.75	40.25	40.25	40.25	40.25	40.25
Remove Meter Lock	$/activity	19.31	15.77	15.78	15.78	15.78	15.78
Deregistration Request	$/activity	164.54	105.37	107.42	109.52	111.66	113.83
Disconnect Service	$/activity	110.11	80.63	88.20	88.44	88.70	88.96
Reconnect Service	$/activity	148.08	108.91	117.35	117.55	117.76	117.97

The forecast volume of activities by service is based on analysis of historical volume trends. Meter locks and unlocks are based on historical averages and inflated for growth in the number of connections. Deregistration service requests are based on historical average with a 1% annual growth to reflect an expected increase in demolitions resulting from rezoning. Disconnection and reconnection services have been assumed to grow consistently with historical trends.

The ancillary service charges are forecast to decrease compared to those in place in AA3 to reflect the lower costs achieved during the period as a result of more efficient work practices and competitive tender processes for meter lock services.

The number of activities forecast is presented in the table below.

Table 95 Ancillary service volumes Actual and AA4 forecast: 2009 to 2019

Number of units	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Apply Meter Lock	3,390	2,475	1,856	2,928	2,276	2,600	2,678	2,758	2,841	2,926	3,014
Remove Meter Lock	2,769	2,123	1,651	2,219	1,894	2,300	2,369	2,440	2,513	2,589	2,666
Deregistration Request	1,486	1,995	1,719	1,804	1,920	1,907	2,097	2,181	2,202	2,224	2,247
Disconnect Service	452	822	735	1,020	981	1,400	1,442	1,485	1,530	1,576	1,623
Reconnect Service	490	836	690	943	952	1,288	1,327	1,366	1,407	1,450	1,493

The revenue from ancillary services to be subtracted from the total revenue is presented in below.

Table 96: Forecast revenue from ancillary services: 2014 to 2019

$ million real at 30 June 2014	Jul to Dec 2014	2015	2016	2017	2018	2019	Total
Apply meter lock	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Remove meter lock	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Deregistration	0.2	0.2	0.2	0.2	0.2	0.3	1.4
Disconnection	0.1	0.1	0.1	0.1	0.1	0.1	0.7
Reconnection	0.1	0.1	0.2	0.2	0.2	0.2	0.9
Total ancillary reference service revenue	**0.4**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**3.9**

12.7 Proposed Reference Tariffs for AA4

To calculate the reference tariffs for AA4, ATCO Gas Australia has taken the reference tariffs for AA3 (with the adjustments to the standing charge for B2 and B3 customers outlined above) and multiplied each charging parameter for each AA3 tariff by the customer numbers and consumption forecasts for each AA4 tariff. Each charging parameter is then adjusted by the same amount until the revenue generated by the reference tariffs is equalised with the total revenue to be recovered from reference service customers. This method complies with rule 92(2) of the NGR.

The proposed reference tariffs including the charge for each charging parameter are presented in the table below.

Table 97: AA4 Haulage Reference Tariffs and charging parameters

Charging parameter ($ real at 30 June 2014)	Units	July to Dec 2014	2015	2016	2017	2018	2019
Reference tariff A1							
Standing charge	$/year	46,168.99	47,555.04	48,982.70	50,453.22	51,967.89	53,528.03
Demand charge							
First 10 km	$/GJ km	194.59	200.43	206.44	212.64	219.03	225.60
Distance > 10 km	$/GJ km	102.42	105.49	108.66	111.92	115.28	118.74
Usage charge							
First 10 km	$/GJ km	0.0413	0.0425	0.0438	0.0451	0.0465	0.0479
Distance > 10 km	$/GJ km	0.0206	0.0212	0.0219	0.0225	0.0232	0.0239
Reference tariff A2							
Standing charge	$/Year	25,561.63	26,329.02	27,119.45	27,933.61	28,772.22	29,635.99
First 10 TJ	$/GJ	2.49	2.56	2.64	2.72	2.80	2.89
Volume > 10 TJ	$/GJ	1.34	1.38	1.43	1.47	1.51	1.56
Reference tariff B1							
Standing charge	$/Year	1,287.72	1,326.38	1,366.20	1,407.22	1,449.46	1,492.98
First 5 TJ	$/GJ	5.04	5.19	5.34	5.50	5.67	5.84
Volume > 5 TJ	$/GJ	4.34	4.47	4.60	4.74	4.88	5.03
Reference tariff B2							
Standing charge	$/Year	322.73	338.55	348.72	359.19	369.97	381.08
First 100 GJ	$/GJ	8.32	8.50	8.75	9.01	9.29	9.56
Volume > 100 GJ	$/GJ	5.00	5.11	5.26	5.42	5.58	5.75
Reference tariff B3							
Standing charge	$/Year	70.18	130.53	134.45	138.49	142.64	146.92
First 2 GJ	$/GJ	13.98	-	-	-	-	-
Volume > 2 <10 GJ	$/GJ	13.98	9.90	10.20	10.50	10.82	11.14
Volume > 10 GJ	$/GJ	6.14	4.35	4.48	4.62	4.76	4.90

It is not expected that a final decision on the proposed revisions (and Reference Tariffs) will be provided prior to the commencement of the access arrangement period on 1 July 2014. Therefore, ATCO Gas Australia has calculated the reference tariffs based on the assumption that the tariffs will be effective from 1 January 2015. Rule 92(3) requires that where there is a delay in the commencement of revisions to the access arrangement, the reference tariffs in force in the previous period continue.

The calculation of reference tariffs, and the assumed effective date, will need to be revised throughout the process as the likely effective date becomes more certain.

12.7.1 Average prices

ATCO Gas Australia has considered the impact of changes in Reference Tariff on customer classes and individual B3 customers. This analysis is presented below.

Table 98: Average price impacts by Reference Tariff customer class over AA4

Annual tariff increase (%)	2015	2016	2017	2018	2019	Average annual % change
A1	1.5%	1.8%	4.8%	1.0%	0.9%	2.0%
A2	3.1%	3.2%	2.6%	2.3%	2.3%	2.7%
B1	3.5%	3.5%	3.4%	3.3%	3.3%	3.4%
B2	4.6%	5.1%	4.8%	4.6%	4.6%	4.7%
B3	-1.6%	3.2%	3.0%	2.9%	2.8%	2.0%
All customer average %	-0.8%	1.4%	2.6%	2.6%	2.5%	1.6%

The table below presents the network price impacts for a typical B3 customer using 15 GJ per year.

Table 99: Price impact for typical B3 customer (using 15 GJ) per year over AA4

Annual average network charge Real (2014 $)	2015	2016	2017	2018	2019	Average annual change
Average annual bill for B3 customer (using 15 GJ per year)	218	224	231	238	246	2.0%

12.8 Stand alone and avoidable cost tests

Rule 94(3) requires that the expected revenue of each tariff class lie on or between an upper bound representing the standalone cost of providing the reference service and a lower bound representing the avoidable cost of not providing the reference service.

The expected revenue is determined by calculating the revenue to be generated by the forecast number of customers paying the AA4 reference tariff using the forecast consumption amounts.

The avoidable cost is calculated by identifying the avoidable cost of providing services to each reference tariff class of customers. These costs were identified based on reviewing those costs in each cost centre that would not be incurred if that class of customer was no longer provided with the reference service.

Avoidable operating costs include employee costs, unaccounted for gas and the return on and of avoidable capital costs.

The standalone costs are determined based on subtracting the avoidable operating costs for each tariff class from the total operating cost forecast for AA4, plus the return on and of the capital base required to provide each service. More detail on the approach taken is provided in Appendix 27[276] (Calculation of standalone and avoidable costs by tariff class as per rule 94(3).

The following table presents the expected revenue by tariff class compared with the stand alone and avoidable cost of providing the reference serve.

Table 100: Expected revenue (present value), stand alone and avoidable cost by tariff class.

$ m real at 30 June 2014	A1	A2	B1	B2	B3
Expected revenue	43.0	38.9	52.9	55.0	746.0
Stand alone cost	408.9	532.0	637.5	654.1	841.2
Avoidable cost	6.2	5.0	8.5	8.3	88.0
Compliance with Rule 94 (3)	Yes	Yes	Yes	Yes	Yes

12.9 Reference tariff variation mechanism

The reference tariff variation mechanism provides how a particular reference tariff may vary over the term of the access arrangement. ATCO Gas Australia proposes that reference tariffs vary over AA4 according to a formula and as a result of a cost pass through for a defined event as provided for under rule 97(1)(d).

The proposed variation mechanism will be different for A1, A2 and B1 customers to that which is proposed to apply to B2 and B3 customers. Ancillary service charges presented in section 12.6.2 will be varied only by CPI.

The proposed cost pass through mechanism will include costs associated with new or altered legislative or regulatory requirements, including tax and the payment of licence fees to government and regulatory agencies.

For A1, A2 and B1 customers, a tariff basket price control is proposed. For B2 and B3 Reference Tariffs, a revenue yield control is proposed.

The effects of the reference tariff variation mechanism are:

- For tariff classes A1, A2 and B1 the weighted average price of these tariffs will vary in line with the forecast required variation. This provides flexibility to restructure these tariffs within an overall constraint to respond to new information regarding the cost of serving particular customers and more efficient charging parameters. These customers are more likely to respond to ATCO Gas Australia, market development and pricing initiatives and consumption is less likely to vary with weather

- For tariff classes B2 and B3 tariffs will vary from year to year where average consumption per customer is different to the forecast average consumption per customer. This approach reduces the risk to ATCO Gas Australia of declines in average consumption per customer that are greater than the decline forecast. In the event average consumption per customer increases compared to forecast, customer tariffs will reduce compared to that forecast.

[276] Appendix 27 : Avoidable and stand alone cost assessment by reference tariff class, ATCO Gas Australia, March 2014.

The tariff variation mechanism formula is provided in Annexure B of the access arrangement and annual application of the formula and cost pass through provisions will continue to be subject to review and approval by the ERA.

In deciding whether a tariff variation mechanism is appropriate, under Rule 97(3) the ERA must have regard to:

a) the need for efficient tariff structures; and

b) the possible effects of the *reference tariff variation mechanism* on administrative costs of the ERA, the service provider, and users or potential users; and

c) the regulatory arrangements (if any) applicable to the relevant reference services before the commencement of the proposed *reference tariff variation mechanism*; and

d) the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction); and

e) any other relevant factor.

ATCO Gas Australia considered three basic forms of price control in relation to haulage tariffs:

- **Weighted average price cap** – a cap on a weighted average of the prices of a basket of services, rather than the revenue received from the services
- **Revenue cap** – a fixed revenue allowance for each year of the access arrangement period regardless of the output or services sold in any year
- **Revenue yield control** – a cap expressed in terms of output sold in any given year of the access arrangement period

Each form has its relative strengths and weaknesses.

In determining the appropriate form of control in AA4, ATCO Gas Australia has considered the economic costs and risks faced by the business due to the trend of declining consumption and impacts on incentives to grow the gas market to reduce prices to customers over time.

12.9.1 Revenue yield control

In prior periods, the access arrangement has included a price cap form of control where each reference tariff varied in line with a formula. Over the last two access arrangement periods, significantly less revenue has been recovered than forecast.

The variation between forecast and actual consumption has been particularly apparent for B3 customers. The two charts below shows the forecast consumption for B2 and B3 customers over AA3 compared with the actual consumption.

Figure 91: Actual less benchmark volumes for B3 tariff connections

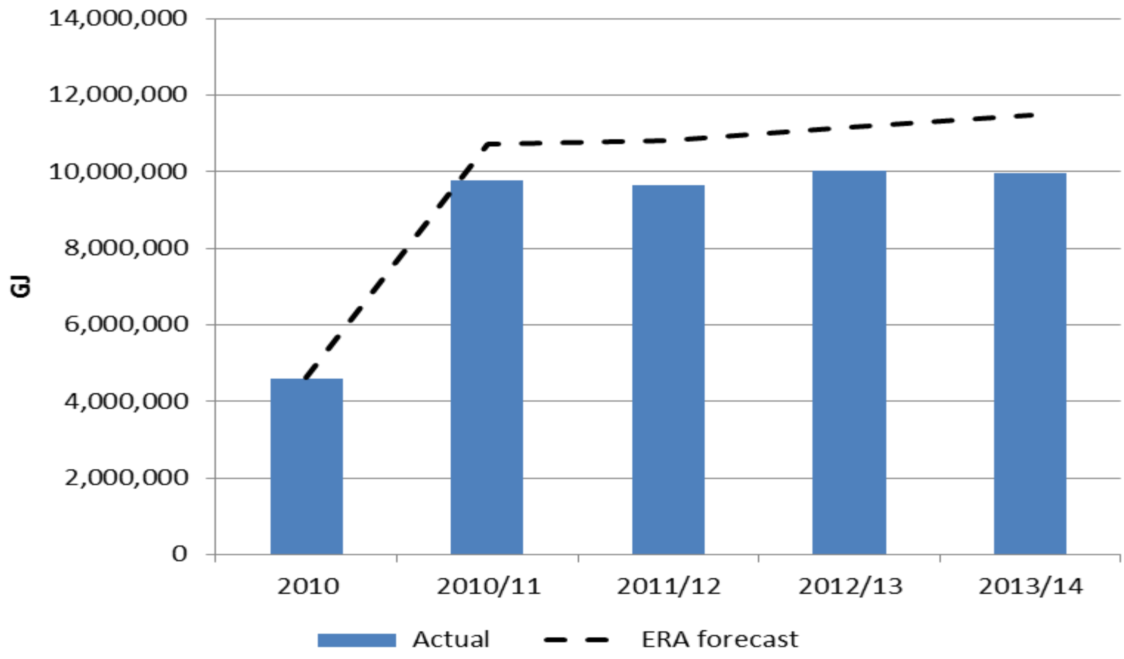
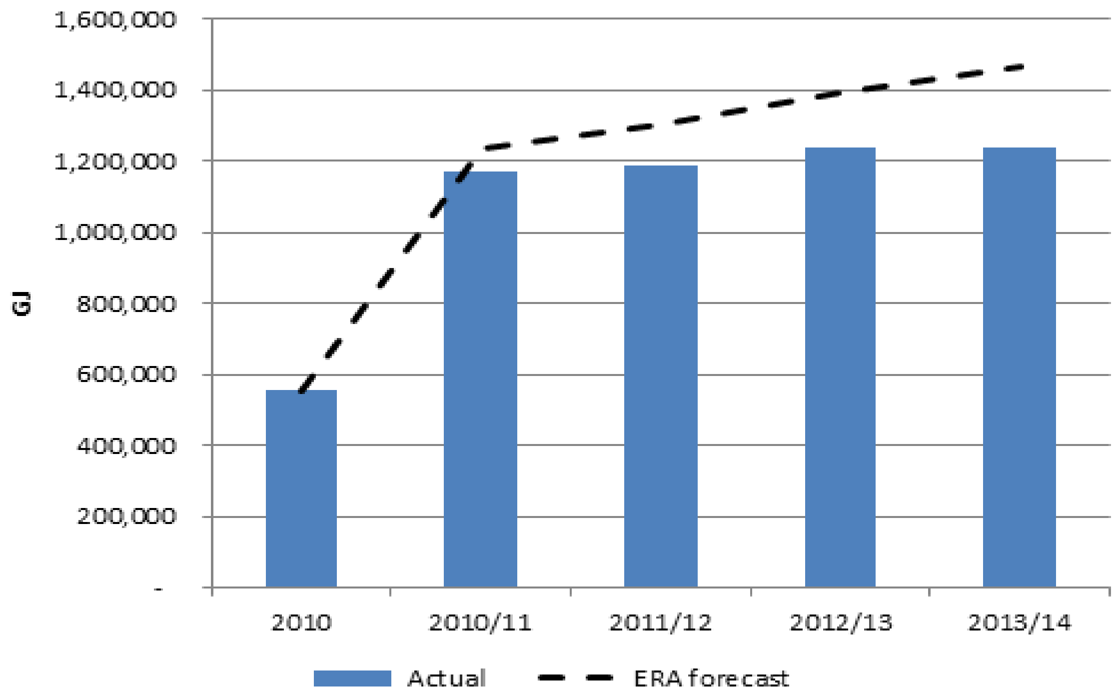
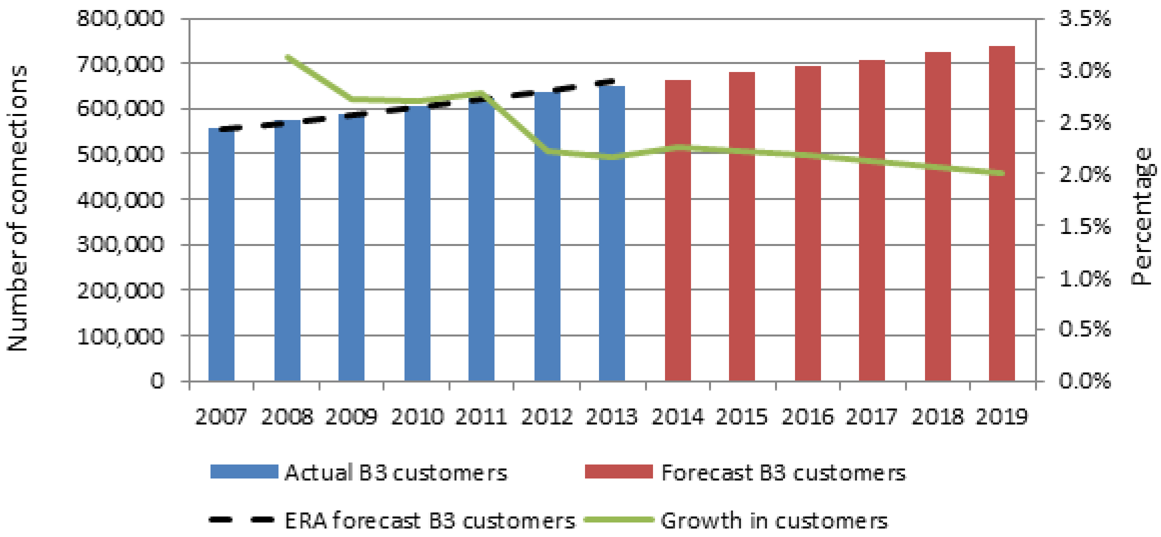


Figure 92: Actual less benchmark volumes for B2 tariff connections



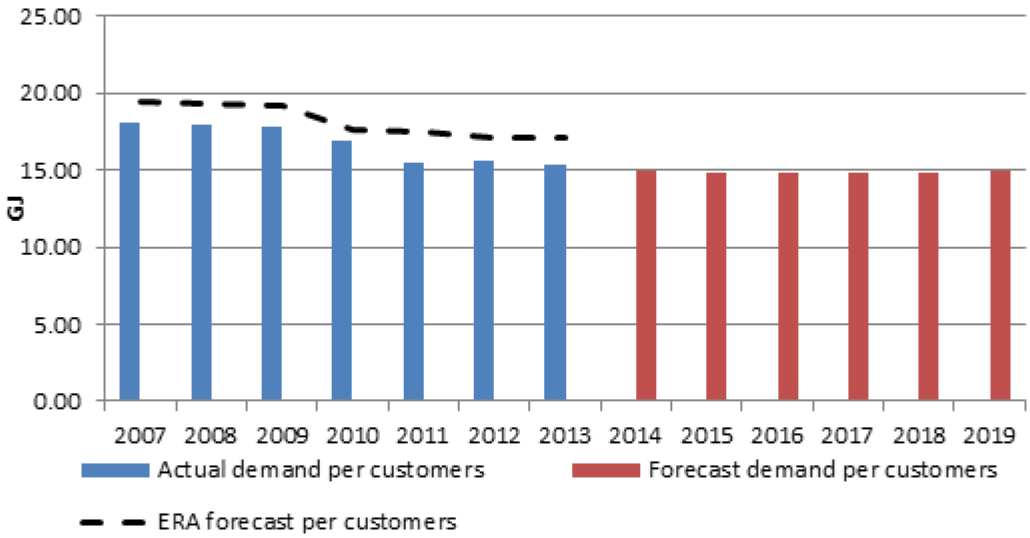
ATCO Gas Australia's analysis shows that the reduced levels of consumption compared to forecast have been primarily driven by declining consumption per connection point. Although there is a decline in the rate of new connections, the number of connections is expected to remain reasonably flat in AA4. The following chart shows the ERA's approved forecast of residential connections with the actual residential connections and the growth rate for new connections. Forecast number of B3 connections and consumption per connection with the actual number of B3 connections and average consumption per connection.

Figure 93: Forecast and actual growth in B3 tariff customer connections



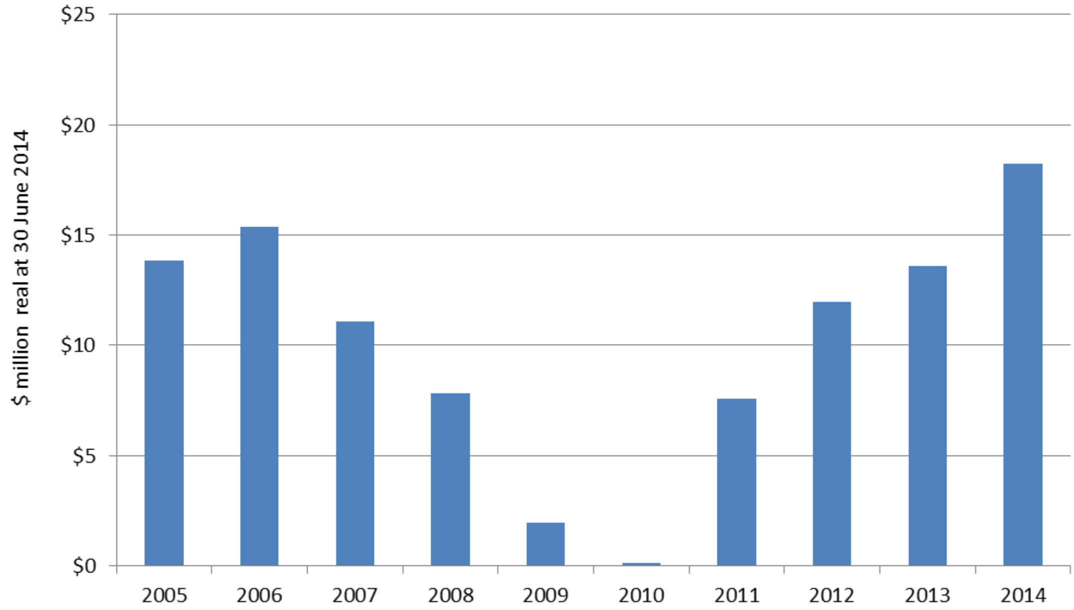
The chart below shows the forecast average demand for residential customers with the actual average demand for residential customers.

Figure 94: Forecast and actual average consumption for B3 customer connections



The reduced levels of consumption led to significant under recovery of revenue. The majority of costs associated with providing gas haulage services are fixed, which means that a reduction in consumption levels does not result in reduced costs. The under recovery of revenue due to overestimating demand has occurred over the last two regulatory periods. During the AA2 period $50.1 million less revenue than forecast was recovered. In AA3 $51.5 million less revenue was recovered than that determined to be required given the forecast costs to be incurred. Figure 95 shows the annual under recovery over the last two access arrangement periods.

Figure 95: Under-recovery of revenue over AA2 and AA3 periods



To reduce the likelihood of overestimating demand in AA4, as discussed in Chapter 5 (Demand), ATCO Gas Australia engaged independent experts Core Energy to assist with applying a more robust methodology to forecasting gas usage in Western Australia. Core Energy are market leaders in the area of demand and connection forecasting and employ the EDD (effective degree day) method of weather normalisation. The improved demand forecasting methodology used in this access arrangement proposal is described in the Chapter 5 (Demand).

For AA4, ATCO Gas Australia forecasts a continuing decline in the average consumption per residential customer. ATCO Gas Australia expects that the improvements in the demand forecasting methodology will assist with improving the accuracy of forecasts to ensure that actual consumption will be closer to the forecast. However, ATCO Gas Australia remains exposed to the risk realised over the last two access arrangement periods, namely that the actual decline in average consumption per residential customer was greater than forecast.

ATCO Gas Australia is undertaking considerable marketing and business development initiatives to attempt to grow the use of gas across the Network. However, it is expected these activities will have a greater impact on the number of connections rather than on the average consumption of residential customers. There is little ATCO Gas Australia can do to address the decline in average consumption per residential customer that occurs as a result of increasingly efficient appliances, more efficient building design, weather and the continued focus of Perth residential customers on cooling appliances with heating capability rather than stand-alone gas space heating.

Therefore, for AA4, ATCO Gas Australia proposes that the declining average consumption risk be managed through the application of a revenue yield control on the revenue to be received from each B2 and B3 customer. This means that where consumption per customer declines more than forecast, reference tariffs will vary in the future to recover the lost revenue per customer. This approach reduces the downside risk to ATCO Gas Australia but also increases the benefits to residential customers where average consumption per customer increases compared to forecast. Where there is higher consumption than forecast, customers will receive lower prices in the following years as the over-recovered revenue is returned.

The revenue yield will apply per connection to ensure the incentive to maintain and increase the number of connections continues, as it is the number of connections that has the greatest ability to reduce costs to all customers over the longer term. The revenue under or over recovered per connection will be added or subtracted to the tariffs in the year after the actual revenue is recorded (a two year lag).

A revenue yield tariff variation works by first establishing a forecast yield (revenue) per delivery point. The total allowable tariff revenue in a year is the actual average number of delivery points for the year times the forecast yield per delivery point. The difference between the forecast tariff revenue for the year and the allowable tariff revenue based on actual customer numbers is added to the allowable tariff revenue in a subsequent year so that it may be recovered by varied tariffs in that subsequent year.

(a) Compliance with Rule 97 (3)

The application of a revenue yield form of control to B2 and B3 customers will have minimal effect on the efficient tariff structure as the structure of tariffs will be maintained.

No additional administrative costs are expected as the adjustments for over or under recovered revenue will occur through a formula through the annual tariff variation process.

There has been no change to the regulatory arrangements applicable to the relevant reference services subject to the proposed reference tariff variation mechanism. Insofar as rule 97(3)(c) requires a consideration of the previous form of price control, the change is for the better because it enables ATCO Gas Australia to recover more of its fixed costs despite declining consumption. ATCO Gas Australia's costs are nearly entirely fixed, however, only 32 per cent of its revenue is generated through fixed charges. ATCO Gas Australia has very little ability to manage the declining consumption of customers and yet, the declining consumption has no impact on the costs it incurs.

The application of a revenue yield control to B3 customers of ATCO Gas Australia's gas distribution system will differ from the customers of gas distribution systems in other jurisdictions. However, ATCO Gas Australia faces unique circumstances compared to other gas distribution systems. ATCO Gas Australia has a relatively high exposure to revenue risk compared to other gas distribution businesses as a result of the downward trend in consumption. This is further heightened by the high reliance on usage based tariffs and the historical forecast error. The table below presents analysis undertaken of the five year average percentage variance of actual volumes compared to forecast volumes for residential customers across seven gas distribution networks and the five year average growth for each business.

Table 101: Forecast error and growth in residential demand for gas distribution networks

Gas distribution network	5 year average variance (actual compared to forecast)	5 year average growth
Multinet – VIC	-1.4%	1.9%
SP AusNet – VIC	2.2%	4.6%
Envestra – VIC	-2.5%	3.6%
Envestra – Albury	-6.6%	2.5%
Envestra – SA	-5.0%	0.1%
Envestra – QLD	-5.7%	0.2%
ATCO Gas Australia	-7.7%	-0.6%

ATCO Gas Australia has not been able to recover its efficient costs in previous periods as a result of the declining trend in residential demand being greater than forecast and there is a greater risk that demand is lower than there is that it will be higher. The proposed revenue yield control results in customers sharing the risk associated with weather and increasing efficiency in gas appliances and buildings. To the extent ATCO Gas Australia is able to grow the average consumption of residential gas users beyond that included in the forecast, customers will share in these benefits. ATCO Gas Australia believes that these are relevant considerations for the purpose of deciding on the tariff variation mechanism.

A revenue yield form of control per customer reduces to the advantages to the business of proposing lower forecast consumption than that which might be reasonably expected because the revenue it receives will be constant regardless of the actual consumption of the customers subject to the revenue yield. Further, ATCO Gas Australia does not have the flexibility to efficiently price for small customers due to the application of the *National Gas Access (WA) (Local Provisions) Regulations*. Therefore, in the absence of being able to control the consumption per B2 and B3 customer, the declining trend in consumption per customer and the limited flexibility to increase fixed charges to cover fixed costs, the revenue yield per customer provides the greatest opportunity to recover its efficient costs whilst limiting the likelihood of over recovering its fixed costs due to inaccurate forecasts.

A similar approach is adopted by ATCO Gas in Canada. The approach is referred to as a weather deferral account which has the effect of offsetting revenue risk where temperatures are different to those forecast.

The Alberta Utilities Commission accepted that the weather deferral account addresses factors that have significant impacts on the business, are beyond the control of the business, and therefore not within the ability of the utility to accurately forecast.[277] The proposed approach was considered reasonable because the current rate structure does not match the way costs are incurred. ATCO Gas (Canada) submitted that 100 per cent of its costs were fixed but only 44 per cent of its revenue was recovered through a variable charge. ATCO Gas Australia has a similar circumstance where nearly 100 per cent of its costs are fixed and only 32 per cent of its costs are recovered through fixed charges.

12.9.2 Tariff basket price control

A tariff basket approach provides more flexibility than a price cap to adjust prices in response to changes in:

- Cost relativities among the tariff classes
- Variation from forecast volumes
- Variation from forecast customer numbers

Allowing for prices to be varied within the tariff basket will provide more efficient price signals because it is more likely tariff revenue will reflect the relative cost to be recovered from the tariff classes given current costs, volumes and customer numbers. These customers are more likely to respond to ATCO Gas Australia's marketing and pricing initiatives and consumption is less likely to vary with weather.

The proposed tariff basket form of price control provides for the current tariff structures to be varied over time where the variation is more efficient, results in no additional

[277] Appendix 25: Alberta Utilities Commission, ATCO Gas 2008-2009 General Rate Application, November 2008 , p. 107.

administrative costs and is consistent with the regulatory arrangements for similar services in other jurisdictions.

The Tariff Basket Control Formula set out in Annexure B compares the revenue from the pre-existing reference tariffs with revenue from the reference tariffs as varied, based on the quantities of gas or other units appropriate to the tariff element that applied in the year two years prior to the year in which the reference tariffs are to be varied. The variations in tariffs are constrained so that the total tariff revenue does not increase by more than a factor "X" (being the real increase in tariffs compared to the prior year in real June 2014 dollars.). The resultant tariffs are then inflated to the end of the tariff variation period, consistent with the ERA's tariff modelling year end cash flow assumption.

12.9.3 Reference tariff variation as a result of a cost pass through for a defined event

Rule 97(1)(c) provides for the variation of a reference tariff as a result of a cost pass through for a defined event. The purpose of a cost pass through reference tariff variation is to allow the service provider to recover its efficient and prudent costs consistent with the National Gas Objective (NGO) and revenue and pricing principles to the extent those costs vary from approved cost forecasts due to the costs being:

- not foreseeable at the time of an access arrangement submission or final decision; and
- not within the service providers control during the access arrangement period.

Examples of unforeseeable or uncontrollable costs are set out below:

- Changes to rates of taxation altered during an access arrangement period. Changes to these rates are beyond the control of the service provider but cause costs to be incurred by the service provider and so should be recoverable by the service provider
- New laws proclaimed or changes to regulations made which are not foreseeable at the time of the final decision. For example if new health and safety or environmental regulations are introduced may be incurred that could not have been foreseen.
- Uncontrollable changes to the operating parameters of the network. This could be caused by the introduction of a new source of gas into the network with a different specification, such as a different heating value

ATCO Gas Australia also incurs costs of approximately $3 million per annum in licences and fees. These fees are usually set by Government agencies or independent bodies set up under Government legislation. There is a legislated obligation to pay these fees which is beyond ATCO Gas Australia's control and the level of those fees not foreseeable nor controllable.

The future of the carbon tax is uncertain and costs associated with the carbon tax have not been included in the cost forecasts. A cost pass through mechanism is reasonable to allow the service provider to recover those costs should they be incurred.

ATCO Gas Australia accepts that the rate of gas loss due to leaks or measurement error is within its control and is working to reduce that loss. However, the cost of gas that ATCO Gas Australia must purchase to make good those losses is driven by forces beyond its control, for example, the balance of supply and demand for gas. Therefore a cost pass through mechanism is required to allow the recovery of variations in the unit cost of gas.

ATCO Gas Australia is required to have a Gas Utilisation Inspection Plan, which is accepted by Energy*Safety*, in order to comply with the Gas Standards (Gasfitting and consumer gas installations) Regulations 1999. The plan outlines ATCO Gas Australia's requirements to inspect customer gas installations, downstream of the Network, to ensure they are safe to take gas and other requirements such as to investigate and report consumer gas installation incidents. The costs associated with these activities have been forecast based on historical number of activities. However, There is no clear relationship between the number of these activities and the forecast new connections so the number of activities and associated costs are difficult to forecast and uncertain. In addition, there are periodic variations in the nature of and rates of inspections prescribed in revisions to the Gas Utilisation Inspection Plan agreed with Energy*Safety*. Therefore, a cost pass through mechanism is appropriate.

Using a cost pass through mechanism as envisaged by Rule 97(1)(a) allows for tariffs to include the costs that can be reasonably foreseen. In the event unforeseen costs are unable to be recovered, a service provider would seek to provide an allowance for these costs in the forecast of cost. It is much more efficient to only recover these costs when they are incurred rather than recover a contingent amount in the event that the cost is not incurred.

ATCO Gas Australia proposes that costs associated with new or varied legislated and regulatory changes including variations in the amount of licence fees should be recovered by way of the costs pass through mechanism. The proposed approach for AA4 is very similar to that in place for AA3. The items to be expected in a tariff variation cost pass through are;

- The cost impact of any new or change in law, regulation or any other compliance obligation
- The cost impact of a new or changed licence fee
- the costs associated with HHV or gate station costs incurred by ATCO Gas Australia that constitute conforming capital expenditure or conforming operating expenditure
- The increased cost of gas purchased due to a change in the price of natural gas other than included in the access arrangement forecast
- Other unforeseeable cost increases necessary for ATCO Gas Australia's ongoing compliance with the various laws and regulations governing its ownership and operation of the Network

Definitions of cost pass through events and the operation of the tariff variation in accordance with a cost pass through are contained in Annexure B of the access arrangement. Costs in the context of a cost pass through refer to both capital and operating costs. The amount of capital costs passed through is the return on the asset and deprecation of the asset that would have been included in total revenue had those costs been included in the ERA's final decision.

12.9.4 Tariff variation process

ATCO Gas Australia does not propose any change from the process outlined in the current access arrangement other than the notice required of a tariff variation. The notice period is proposed to be reduced form 90 business days to 45 business days to ensure the necessary ABS CPI statistics are available as required in the tariff variation formula. ATCO Gas Australia's tariff variation process provides the ERA with adequate oversight and powers of approval over variations of the reference tariffs, as required under rule 97(4).

In accordance with the proposed tariff variation process ATCO Gas Australia will notify the ERA in respect of any variations to reference tariffs at least 45 business days before those tariffs are proposed to come into effect. The notification to the ERA will provide an explanation and details of how the proposed variations have been calculated.

The ERA will have 15 business days to approve or reject the proposed variations to reference tariffs. This allows market participants 20 business days to prepare for the implementation of the new tariffs.

13. Incentive mechanisms

13.1 Key Messages

- ATCO Gas Australia does **not** propose any additional incentive mechanisms under rule 98 of the *National Gas Rules*
- ATCO Gas Australia considers the ex-ante forecast of efficient costs, with the application of a combination of tariff basket and revenue yield form of control, provides sufficient incentive for efficiency
- ATCO Gas Australia's improved demand forecast methodology is expected to address the over-estimation of demand that characterised the AA2 and AA3 periods

13.2 Regulatory requirements

Rule 98 of the *National Gas Rules* (NGR) states:

1) A full access arrangement may include (and the AER may require it to include) one or more incentive mechanisms to encourage efficiency in the provision of services by the service provider.

2) An incentive mechanism may provide for carrying over increments for efficiency gains and decrements for losses of efficiency from one access arrangement period to the next.

3) An incentive mechanism must be consistent with the revenue and pricing principles.

Rule 72(l) requires the access arrangement information to set out the rationale for any proposed incentive mechanism.

Rule 76(d) provides that total revenue is to be determined for each regulatory years of the access arrangement period using the building block approach in which one of the building blocks is increments or decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency.

Rule 72(1)(i) provides that, if an incentive mechanism operated for the previous access arrangement period, then the access arrangement information must provide the proposed carry-over of increments for efficiency gains or decrements for efficiency losses and demonstrate how allowance is to be made for such increments or decrements.

13.3 Proposal

ATCO Gas Australia has not revised the access arrangement to include an incentive mechanism under rule 98. Therefore, there will be no amount added to the target revenue for the carryover for efficiency gains or losses for the purposes of rules 72(1)(l) and 76(d).

ATCO Gas Australia considers the incentives inherent in the ex-ante approach to determining target revenue and the current form of control provides sufficient incentive to achieve efficient costs. This view is discussed below:

- **The ex-ante approach to determining target revenue**. Where ATCO Gas Australia is able to deliver services for less than the forecast costs, the benefits are retained. Where ATCO Gas Australia incurs higher costs, these are absorbed. This provides a strong incentive to continue to manage costs and seek efficiencies in the provision of services

- **The tariff basket and revenue yield form of control**. Where ATCO Gas Australia is able to efficiently grow the market, additional revenue is retained. Where the market declines, revenue declines. This provides strong incentives to only incur costs to maintain and grow the market to the extent that the costs incurred are less than the revenue that might be gained or lost

ATCO Gas Australia has sought expert advice and utilised its actual demand information to forecast customer numbers and customer consumption. The methodology has been improved to better recognise the factors contributing to changes in consumption and is expected to address the over estimation of demand that characterised the AA2 and AA3 regulatory periods. Refer to Chapter 5 of this access arrangement information for discussion of ATCO Gas Australia's demand forecast methodology.

14. Fixed principles

14.1 Key Messages

- ATCO Gas Australia proposes the fixed principles due to expire on 25 August 2015 be retained for a further ten years
- ATCO Gas Australia proposes two additional fixed principles:
    - Apply the historical cost accounting method and straight line depreciation to the entire capital base from no later than 1 January 2025
    - Enable any amount of allowable revenue under or over recovered for B2 and B3 tariff classes based on a yield per delivery point approach in an access arrangement period to be recovered or returned in the the subsequent access arrangement period

14.2 Rule requirements

Rule 99 of the NGR provides that an access arrangement may include principles that are fixed for a declared period. Fixed principles may be agreed on for two or more access arrangement periods.

The purpose of fixed principles is to provide certainty that particular principles will not be subject to review in the following access arrangement (or for a period agreed). This gives the service provider certainty on a particular matter and reassures the regulator and customers that a particular principle will go unchanged for a pre-determined period.

14.3 Existing fixed principles

The following principles[278] were approved by the ERA as fixed principles on 25 August 2005 for a period of ten years:

(i) the financing structure (being a 60/40 debt/equity ratio) that has been assumed for the purposes of determining the Rate of Return for the WAGN GDS;

(ii) the straight-line method of depreciation for each group of assets referred to in part 9; and

(iii) that FRC (full retail contestability) Costs that are incurred, or are expected to be incurred, in the delivery of Reference Services are included as a component of Operating Expenditure;

(iv) the inclusion of:

(A) HHV (higher heating value) Costs that are Conforming Capital Expenditure in the Opening Capital Base for the WAGN GDS at the Revision Commencement Date; and

(B) in Total Revenue HHV Costs that are Operating Expenditure for the Next Access Arrangement Period in respect of the WAGN GDS

[278] Access Arrangement for the Mid-West and South-West Gas Distribution Systems, 8 June 2012, Part 11, p. 25.

14.4 Extension of existing fixed principles

ATCO Gas Australia proposes the fixed principles due to expire on 25 August 2015 be retained until 31 December 2029. ATCO Gas Australia considers that the fixed principles relating to 60:40 capital structure, straight-line depreciation, HHV costs and FRC costs remain relevant and provide stability for the business and customers across regulatory periods.

The adoption of a 60:40 capital structure is consistent with the ERA's *Rate of Return Guideline*. Continuing this principle and the requirement to apply straight line depreciation will ensure consistent treatment of the capital base over time.

The ability to recover costs associated with a higher heating value (HHV) and full retail contestability (FRC) remain relevant and appropriate to retain as fixed principles.

With regard to HHV, the ATCO Gas Australia HHV Management Plan contains principles and processes that ensure the difference between the average HHV for the sub-network and the leanest supplied HHV at a gate point is not more than 1 MJ/m^3. The plan includes a process for ATCO Gas Australia to instigate capped billing in the event that there is a more than a 1 MJ/m^3 variation. Capped billing results in ATCO Gas Australia billing all 290,000 end-use customers[279] at an HHV that is not more than the leanest injected HHV plus 1 MJ.

If the HHV consistently varies by more than 1 MJ/m^3 in parts of the sub-network, the expectation is ATCO Gas Australia would be required to establish HHV Zones (additional gas zones) within that sub-network such that the gas quality existing in those gas zones does not vary by more than 1 MJ/m^3. Establishing additional gas zones in the North Metro zone would result in additional costs being incurred to:

- Establish gas zone boundaries within its metering and billing systems
- Allocate each MIRN (end-use customer) to the respective new gas zone
- Install gas chromatographs at various points of the sub-network to monitor the gas quality to ensure the gas zone boundaries are accurately drawn
- Create physical new sub-networks to replace North Metro

Events leading to these costs are possible but unlikely. However, the costs that would be incurred are legitimate and difficult to forecast. Therefore ATCO Gas Australia proposes that this fixed principle remains.

With regard to FRC, costs that may arise from full retail contestability have not been factored in to the AA4 expenditure forecast. However, it is possible FRC costs could emerge during the period. To put beyond doubt that these legitimate costs to be recovered when incurred and are difficult to forecast in advance, ATCO Gas Australia proposes the fixed principle remains.

14.5 New Fixed Principle to apply historical cost accounting and straight line depreciation

ATCO Gas Australia proposes a new fixed principle to address transitional issues arising as a result of the change to rule 87 of the NGR, which requires a nominal rate of return. Under the current access arrangement, the opening and projected capital base are adjusted for

[279] As identified by the meter identification reference number (MIRN)

inflation under a current cost accounting method and a real rate of return applied. The rule change results in the inflation component of the calculation of total revenue being recovered through the rate of return each year rather than over time through inflation of the capital base.

ATCO Gas Australia proposes to apply the historical cost accounting method to the capital base to support the proper application of a nominal rate of return. Applying this method to the opening capital base and future capital from the commencement of the next regulatory period would result in lower prices over the long term. However, the method would also result in short term price increases.

To reduce the short term impact on customers (whilst ensuring the long term efficiency benefits), ATCO Gas Australia proposes a transition period whereby the historical cost accounting (HCA) method is applied to the existing capital base progressively over the next two access arrangement periods (see Chapter 9).

ATCO Gas Australia proposes the transition period is fixed so that the HCA method must apply to the entire capital base from no later than 1 January 2025. This will provide customers and the service provider certainty over future costs.

The fixed principle would be as follows (clause 11.3 of the revised access arrangement):

"The following principles are declared as fixed principles for the period 1 July 2015 until 1 January 2030.

1) ***Calculation of depreciation for Opening Capital Base for the Access Arrangement Period commencing immediately after the Next Access Arrangement Period***

   (a) Forecast depreciation over the Next Access Arrangement Period (ie the Access Arrangement Period commencing 1 January 2020) is to be the sum of depreciation calculated as follows:

      (i) for capital assets in existence at 1 January 2000, of the inflation indexed opening capital base in any year divided by the remaining asset life less the amount of any indexation on that opening capital base;

      (ii) of the Opening Capital Base for the Access Arrangement Period commencing 1 July 2014 (other than capital assets in existence at 1 January 2000) the opening capital base in any year (indexed for inflation to 1 January 2020) divided by the remaining asset life;

      (iii) of capital expenditure made during the Current Access Arrangement Period (ie the Access Arrangement Period commencing 1 July 2014), the opening capital base in any year at acquisition value (not indexed for inflation) divided by the remaining asset life; and

      (iv) of the forecast Capital Expenditure for the Next Access Arrangement Period (being the amount of forecast Capital Expenditure used for the purpose of determining Haulage Tariffs for the Next Access Arrangement Period), at acquisition value (not indexed for inflation) divided by the remaining asset life.

   (b) For the calculation of the Opening Capital Base for the ATCO Gas Australia GDS for the Access Arrangement Period commencing immediately after the Next Access Arrangement Period (ie the Access Arrangement Period expected to commence 1 January 2025):

(i) *the capital assets in existence at 1 January 2000 are to be indexed for inflation to 1 January 2025;*

(ii) *the capital assets comprising the Opening Capital Base for the Access Arrangement Period commencing 1 July 2014 (other than capital assets in existence at 1 January 2000) are to be indexed for inflation to 1 January 2020;*

(iii) *all other capital assets are not indexed for inflation; and*

(iv) *for the purposes of rule 77(2)(d) of the National Gas Rules, depreciation over the Next Access Arrangement Period will be as calculated above in clause 1(a)(i)*

2) Calculation of depreciation for Opening Capital Base for Subsequent Arrangement Periods

(a) *In this clause, Subsequent Access Arrangement Period means an Access Arrangement Period commencing after the Access Arrangement Period commencing immediately after the Next Access Arrangement Period (ie a Subsequent Access Arrangement Period is an Access Arrangement Period expected to commence 1 January 2030 and thereafter).*

(b) *Forecast depreciation over the Access Arrangement Period commencing immediately after the next Access Arrangement Period (ie the Access Arrangement Period expected to commence 1 January 2025), and every Subsequent Access Arrangement Period, is to be the sum of depreciation calculated as follows:*

(i) *for capital assets in existence at 1 January 2000, of the opening capital base in any year (indexed for inflation to 1 January 2025) divided by the remaining asset life;*

(ii) *of the Opening Capital Base for the Access Arrangement Period commencing 1 July 2014 (other than capital assets in existence at 1 January 2000) the opening capital base in any year (indexed for inflation to 1 January 2020) divided by the remaining asset life;*

(iii) *of actual capital expenditure made on and after 1 July 2014, the opening asset base in any year at acquisition value (not indexed for inflation) divided by the remaining asset life;*

(iv) *of the forecast Capital Expenditure for the Access Arrangement Period (being the amount of forecast Capital Expenditure used for the purpose of determining Haulage Tariffs for the that Access Arrangement Period), at acquisition value (not indexed for inflation) divided by the remaining asset life.*

(c) *For the calculation of the Opening Capital Base for Subsequent Access Arrangement Periods:*

(i) *the capital assets in existence at 1 January 2000 are to be indexed for inflation to 1 January 2025;*

(ii) *the capital assets comprising the Opening Capital Base for the Access Arrangement Period commencing 1 July 2014 (other than capital assets in existence at 1 January 2000) are to be indexed for inflation to 1 January 2020* *(iii) all other capital assets are not indexed for inflation; and*

(iv) for the purposes of rule 77(2)(d) of the National Gas Rules, depreciation over the Access Arrangement Period immediately before the Subsequent Access Arrangement Period will be as calculated above in clause 2(b)(iv).

(d) For the avoidance of doubt, for the Access Arrangement Period commencing immediately after the Next Access Arrangement Period (ie the Access Arrangement Period expected to commence 1 January 2025) and all Subsequent Access Arrangement Periods, all capital assets will be depreciated at the rate of their opening asset value divided by their remaining asset life. No inflation indexation will occur after the Access Arrangement Period commencing immediately after the Next Access Arrangement Period."

This new fixed principle would apply for the period 1 July 2014 to 1 January 2030.

14.6 New fixed principle to enable the recovery of amounts associated with the AA4 tariff variation mechanism in AA5

Rule 97(2) of the NGR provides for a revenue yield formula for variation of reference tariffs. This variation method requires the revenue in the year following the subsequent year to that in which a reference tariff applies to be adjusted for an amount of revenue under or over recovered under the tariff variation mechanism. However, the adjustment occurs in the second year after the year that the reference tariff applies.

ATCO Gas Australia has included in the access arrangement a fixed principle to allow the revenue under or over recovered under the tariffs in the last or second to last year of the preceding regulatory period to be applied in the next access arrangement period (and the one after that) consistent with rule 97(2).

The proposed fixed principle is as follows (clause 11.4 of the revised access arrangement):

"The following principle is declared as a fixed principle for the Access Arrangement period commencing 1 January 2020:

1) The revenue to be determined in the Next Access Arrangement Period is to include an amount determined for the year commencing 1 January 2018, and an amount estimated for the year commencing 1 January 2019, that is the under-recovery or over-recovery of revenue for that year calculated under the tariff variation mechanism to be applied to B2 and B3 reference service revenue yield.

2) The revenue to be calculated in the Access Arrangement Period commencing immediately after the Next Access Arrangement Period (ie the Access Arrangement Period expected to commence 1 January 2025) is to include an amount to adjust the estimate for the year 1 January 2019 for actual revenue outcomes for that year.

3) These amounts are to be adjusted for the rate of return applicable in the AA4 access arrangement period (ie: the Access Arrangement Period commencing on 1 July 2014)."

15. Glossary

This Glossary sets out the definitions given to capitalised terms used in the Access Arrangement, the Template Haulage Contract and the Access Arrangement Information document.

Term	Definition
Access Arrangement	has the meaning given to that term in the National Gas Access Law and in particular, and as the context requires, means the access arrangement for the ATCO Gas Australia GDS approved under the Code on 18 July 2000 and subsequently revised under the Code and the Access Laws ("this" Access Arrangement and "the " Access Arrangement).
Access Arrangement Information	means this document containing the information described in rule 42 of the National Gas Rules and provided to the ERA with the last revision proposal to this Access Arrangement.
Access Arrangement Period	has the meaning given to that term in rule 3 of the National Gas Rules.
Access Determination	has the meaning given to that term in the National Gas Access Law.
Access Dispute	has the meaning given to that term in the National Gas Access Law.
Access Laws	means: (a) the National Gas Access Law; and (b) the National Gas Rules.
AEMC	means the Australian Energy Market Commission.
AEMO	means the Australian Energy Market Operator.
ATCO Gas Australia	means ATCO Gas Australia Pty Ltd (ABN 90 089 531 975) (formerly WA Gas Networks and formerly Alinta Gas Networks).
ATCO Gas Australia GDS	means the Mid-West and South-West Gas Distribution Systems (formerly known as the WAGN GDS) owned by ATCO Gas Australia.
Ancillary Services	means any one of Deregistering a Delivery Point, Applying a Meter Lock, Removing a Meter Lock, Disconnecting a Delivery Point and Reconnecting a Delivery Point and Ancillary Services means all of them.
Applicable Tax	has the meaning given to that term in the definition of "Tax" specified in this Glossary.
Application Procedure	means the application procedure specified in Part 5 of the Access Arrangement under which a Prospective User wishing to obtain access to a Pipeline Service must submit an Application.
Applying a Meter Lock	means the Pipeline Service described in paragraph 4.8 of the Access Arrangement.
Approved System Pressure Protection Plan	means the System Pressure Protection Plan approved by **<Service Provider>** under the Access Arrangement.
Arbitrator	means the person appointed to hear a dispute between the Parties in accordance with clause 19.3 of the Haulage Contract.

ATCO Gas Australia	means ATCO Gas Australia Pty Ltd (ABN 90 089 531 975) (formerly WA Gas Networks and formerly Alinta Gas Networks).
Australian Consumer Law	means the Australian Consumer Law as set out in Schedule 2 to the *Competition and Consumer Act 2010* (Cth).
Authority	means the Economic Regulation Authority.
Business Day	means a day that is not: (a) a Saturday or Sunday; or (b) observed as a public holiday, a special holiday or bank holiday under the *Public and Bank Holidays Act 1972* (WA).
Capacity	means the measure of the potential of a Covered Pipeline as currently configured to deliver a particular Pipeline Service between a Receipt Point and a Delivery Point at a point in time.
Capacity Trading Requirements	refers to the requirements specified in Part 6 of the Access Arrangement
Capital Base	in relation to the ATCO Gas Australia GDS, means the capital value to be attributed, in accordance with Part 9 of the National Gas Rules, to the ATCO Gas Australia GDS
Capital Contribution	has the meaning given to that term in the National Gas Rules
Capital Expenditure	has the meaning given to that term in the National Gas Rules
Change in Law	means: (a) the introduction of a new Law; (b) an amendment to, or repeal of, an existing Law; or (c) a new or changed interpretation of an existing Law resulting from a decision of: (i) a court; (ii) a tribunal; (iii) an arbitrator; (iv) a Government or regulatory department, body, instrumentality, minister, commissioner, officer, agency or other authority; or (v) a person or body which is the successor to the administrative responsibilities of any person or body described in paragraph (iv) of this definition;
Code	means the National Third Party Access Code for Natural Gas Pipeline Systems, previously in force in Western Australia under the *Gas Pipelines Access (Western Australia) Act* 1998 (WA).
Confidential Information	means all information in any form which is communicated to, or obtained by, a Party and that is: (a) provided in confidence and that the disclosing Party has asked to be kept confidential;

	(b) non-public information about the use of Pipeline Services (including, without limitation, the terms of the Haulage Contract) or the acquisition or consumption of Gas; or (c) information that a reasonable person would regard as actually or potentially confidential.
Conforming Capital Expenditure	has the meaning given to that term in the National Gas Rules.
Conforming Operating Expenditure	means Operating Expenditure that complies with the criteria governing Operating Expenditure under the National Gas Rules.
Cost Pass Through Event	refers to an event defined as a cost pass through event in clause 3 of Annexure B of the Access Arrangement.
Covered Pipeline	has the meaning given to that term in section 2 of the National Gas Access Law.
Covered Pipeline Service Provider	has the meaning given to that term in section 2 of the National Gas Access Law.
CPI All Groups, Weighted Average of Eight Capital Cities	means the Consumer Price Index All Groups Index Number for All Groups, Weighted Average of Eight Capital Cities published by the Australian Bureau of Statistics or, if applicable, an alternative index determined under clause 2.7 of Annexure B of the Access Arrangement.
Current Access Arrangement Period	means the Access Arrangement Period to which the Access Arrangement currently relates.
Curtail	means to reduce, interrupt or stop, or any combination of them.
Delivery Facilities	means, as applicable, Standard Delivery Facilities or User Specific Delivery Facilities.
Delivery Point	means a point, including a flange or joint, specified in a Service Agreement and in the Delivery Point Register, as a point at which **<User>** is entitled to take delivery of Gas from **<Service Provider>** out of the ATCO Gas Australia GDS.
Delivery Point Register	means a database or collection of databases established and maintained in accordance with clause 5.4 of the Haulage Contract and containing the details of Delivery Points and other information described in that clause 5.4, and which may contain other information, including information about other Users.
Demand Charge	for Tariff A1 means the charge described in clause 1.1 (a) (i) of Annexure A of the Access Arrangement.
Demand Charge Rate	for Tariff A1 means the rate specified in clause 1.1 (b) (ii) of Annexure A of the Access Arrangement.
Deregistered	means, in relation to a Delivery Point, that Gas is permanently precluded from being supplied at the Delivery Point because the Delivery Point is permanently deregistered in accordance with Part 3.6 of the Retail Market Rules and: (a) for a Delivery Point to which Service A1 applies, the procedure specified clause 9 of Schedule 1 of the Haulage Contract; (b) for a Delivery Point to which Service A2 applies, the procedure specified in clause 9 of Schedule 2 of the Haulage Contract;

	(c) for a Delivery Point to which Service B1 applies, the procedure specified in clause 8 of Schedule 3 of the Haulage Contract; (d) for a Delivery Point to which Service B2 applies, the procedure specified in clause 7 of Schedule 4 of the Haulage Contract; and (e) for a Delivery Point to which Service B3 applies, the procedure specified clause 7 of Schedule 5 of the Haulage Contract.
Deregistering a Delivery Point	means the Pipeline Service described in paragraph 4.7 of the Access Arrangement.
Disconnecting a Delivery Point	means the Pipeline Service described in paragraph 4.10 of the Access Arrangement.
Distribution Licence	means the licence granted to ATCO Gas Australia by the ERA on18 November 2007, which replaced licences GDL1, GDL2 and GDL3 granted on 1 July 2000, that authorises ATCO Gas Australia to transport Gas through the ATCO Gas Australia GDS and, if required for that purpose, to make alterations to the ATCO Gas Australia GDS, and to operate and maintain the ATCO Gas Australia GDS.
EDD	means Effective Degree Days.
Energy Safety	means the state government regulator responsible for the technical and safety regulation of all the electrical industry and most of the gas industry in Western Australia.
ERA	means the Economic Regulation Authority of Western Australia.
Extension or Expansion	means any extension to, or expansion of, the Capacity of the ATCO Gas Australia GDS and includes a new Pipeline.
Extension and Expansion Requirements	refers to the requirements specified in Part 7 of the Access Arrangement.
FRC Costs	means the Operating Expenditure connected to or associated with: (a) the introduction of full retail contestability in the Western Australian Gas market; and (b) ATCO Gas Australia operating in a contestable Gas retail market, including the ongoing costs associated with ATCO Gas Australia's membership of REMCo and its compliance with the Retail Market Scheme.
Gas	means natural gas, being a substance that: (a) is in a gaseous state at standard temperature and pressure; (b) consists of naturally occurring hydrocarbons, or a naturally occurring mixture of hydrocarbons and non-hydrocarbons, the principal constituent of which is methane; and (c) is suitable for consumption.
Gas Day	means a 24 hour period starting at 08:00 hours (Western Standard Time or, if applicable, Western Standard Daylight Savings Time) on a day and ending at 08:00 hours on the following day, so that: (a) a reference to a Gas Day is a reference to the Gas Day commencing at

	08:00 hours on the day or date referred to, and ending at 08:00 hours on the following day; and (b) references to months, quarters and years are to be given corresponding meanings; and (c) in reckoning of months, quarters and Years, the 8 hour offset between months, quarters and Years reckoned under (b) above and calendar months, quarters and Years, is to be disregarded.
Gas Hour	means a period of sixty minutes commencing and ending on the hour.
Gas Quality Specifications	means the gas quality specifications prescribed by the Gas Standards Regulations.
Gas Standards Regulations	means the *Gas Standards (Gas Supply and System Safety) Regulations 2000* (WA) and any other regulations under the *Gas Standards Act 1972* (WA) which relate to Gas safety, system safety and Gas quality, including heating value.
Gate station	means the metering equipment site associated with a Physical Gate Point (whether it comprises part of an Interconnected Pipeline or the ATCO Gas Australia GDS); and includes all facilities installed at the site to perform over pressure protection, reverse flow protection, excessive flow protection, gas metering and measurement and telemetry, and odorization, and all standby, emergency and safety facilities and all ancillary equipment and services.
Gigajoule	means 1000 (one thousand) Megajoules
Glossary	means this glossary setting out the definitions of terms used in the Access Arrangement and the Haulage Contract.
GST	means: (a) the same as in the GST Law; (b) any other goods and services tax, or any tax applying to a transaction under or in connection with the Access Arrangement or a Service Agreement in a similar way; and (c) any additional tax, penalty tax, fine, interest or other charge under a law for such a tax.
GST Law	has the meaning given to the term "GST law" in the *A New Tax System (Goods and Services Tax) Act 1999* (Cth).
Guaranteed Service Levels	means the standards of service that must be provided by **<Service Provider>** in respect of certain Haulage Services as set out in a Regulatory Instrument.
Haulage Charge	for a Haulage Service, means the amount payable by **<User>** to **<Service Provider>** under the Haulage Contract for that Haulage Service, being: (a) for Service A1, the amount determined under clause 6 of Schedule 1 of the Haulage Contract; (b) for Service A2, the amount determined under clause 6 of Schedule 2 of the Haulage Contract; (c) for Service B1, the amount determined under clause 6 of Schedule 3 of the Haulage Contract;

	(d) for Service B2, the amount determined under clause 5 of Schedule 4 of the Haulage Contract; and (e) for Service B3, the amount determined under clause 5 of Schedule 5 of the Haulage Contract.
Haulage Contract	means the agreement between the Parties under which **<Service Provider>** provides **<User>** with access to one or more Haulage Services for the haulage of Gas from one or more specified Receipt Points to one or more specified Delivery Points on the ATCO Gas Australia GDS, and the annexures, schedules and exhibits to that agreement.
Haulage Service	means any one of Service A1, Service A2, Service B1, Service B2 and Service B3, and **Haulage Services** means all of them.
Haulage Tariff	means any one of Tariff A1, Tariff A2, Tariff B1, Tariff B2 and Tariff B3, and Haulage Tariffs means all of them.
HDD	Means Heating Degree Days.
HHV Costs	means direct capital or operating costs incurred as a result of, the management of heating value blending; including expenditure incurred in connection with the measurement, recording, auditing, facilitation or management of heating value blending for the ATCO Gas Australia GDS to the extent that such costs were not included in formulating the Conforming Capital Expenditure or Conforming Operating Expenditure for the Access Arrangement Period and it is demonstrated that the costs could not reasonably have been forecast.
High Pressure Pipeline Extension	means for the purposes of the Template Haulage Contract an extension to **<Service Provider>** Covered Pipeline with a direct connection to a transmission pipeline that provides reticulated gas to a new development or an existing development not serviced with reticulated gas.
Interconnected Pipeline	means a transmission Pipeline, distribution Pipeline or Gas storage system from which Gas is supplied into the ATCO Gas Australia GDS.
Interconnection Arrangement	means a written or unwritten contract, arrangement or understanding in respect of an interconnection at a Physical Gate Point between the ATCO Gas Australia GDS and an Interconnected Pipeline (and includes a written or unwritten contract, arrangement or understanding for the provision of an Interconnection Service).
Interconnection Distance	in respect of a Delivery Point, means the distance measured along the straight line which represents the shortest distance between the Delivery Point and the nearest Pipeline or storage system from which Gas is (or would be, if Interconnection Arrangements were entered into and necessary Physical Gate Points and associated facilities were constructed) delivered into the ATCO Gas Australia GDS.
Interconnection Event	means an event as a result of which: (a) a Physical Gate Point associated with a Receipt Point is not, or ceases to be, the subject of a current Interconnection Arrangement; or (b) a party to a current Interconnection Arrangement has a right under that Interconnection Arrangement to: (i) wholly or partly Curtail or refuse to accept Gas or otherwise reduce or limit the flow of Gas; or

	(ii) terminate the Interconnection Arrangement.
Interconnection Service	means a Pipeline Service under which ATCO Gas Australia provides for, or facilitates, the interconnection of a Pipeline to the ATCO Gas Australia GDS.
Investigation Proposal	has the meaning given to that term in paragraph 5.3 of the Access Arrangement.
Law or Laws	means all: (a) written and unwritten laws (including, without limitation, laws set out in statutes and subordinate legislation, the common law and equity) of the Commonwealth, of Western Australia, of local government authorities, and of any other State, Territory or foreign country having jurisdiction over the subject matter of a Service Agreement, the Haulage Contract or the Access Arrangement; and (b) judgments, determinations, decisions, rulings, directions, notices, regulations, by-laws, statutory instruments, Codes of Practice, Australian Standards or orders given or made under any of those laws or by any government agency or authority.
Medium Pressure/Low Pressure System	means those parts of the ATCO Gas Australia GDS operating at a nominal pressure of less than 300kPa and includes all high pressure regulators that are part of the ATCO Gas Australia GDS which reduce the pressure from those parts of the ATCO Gas Australia GDS which operate at a nominal pressure of 300kPa or more to those parts of the ATCO Gas Australia GDS which operate at a nominal pressure of less than 300kPa.
Megajoule	means one million Joules.
Meter	means the equipment used to measure the flow of Gas into or out of the ATCO Gas Australia GDS at a Physical Gate Point or a Delivery Point, including any ancillary equipment.
National Gas Access Law	means the National Gas Access (Western Australia) Law as that term is defined in section 7 of the *National Gas Access (WA) Act 2009* (WA).
National Gas Access (Western Australia) Legislation	means: (a) the *National Gas Access (Western Australia) Act 2009* (WA); (b) the National Gas Access Law; (c) the National Gas Rules; and (d) the National Gas Regulations.
National Gas Objective	has the meaning given to that term in section 2 of the National Gas Access Law[280].
National Gas Regulations	has the meaning given to that term in the *National Gas Access (Western Australia) Act 2009.*

[280] As at the date of this Template Haulage Contract, the National Gas Objective, as set out in s 23 and referenced in s 2 of the National Gas Access Law, is "to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas".,

National Gas Rules	has the meaning given to that term in section 2 of the National Gas Access Law.
Network	means the Mid-West South-West Gas Distribution System.
New Relevant Tax	means any Tax affecting an amount which ATCO Gas Australia is or will be required to pay in relation to its supply of one or more Haulage Services.
Next Access Arrangement Period	means the Access Arrangement Period immediately after the Current Access Arrangement Period.
Non-Conforming Capital Expenditure	has the meaning given to that term in the National Gas Rules.
Non-Reference Service	means a Pipeline Service that is not a Haulage Service or an Ancillary Service.
Off-specification Gas	means any Gas which does not comply fully with the Gas Quality Specifications.
Opening Capital Base	has the meaning given to that term in the National Gas Rules
Operating Expenditure	has the meaning given to that term in the National Gas Rules
Original Pipeline Service	means a Pipeline Service from which a Haulage Service is derived.
Overrun Charge	means a charge for an Overrun Service provided as part of Service A1 and calculated in accordance with clause 8 of Schedule 1 of the Haulage Contract.
Overrun Service	has the meaning given to that term in clause 8 of Schedule 1 of the Haulage Contract.
Overrun Service Rate	has the meaning given to that term in clause 8 of Schedule 1 of the Haulage Contract.
Petajoule	means 1000 (one thousand) Terajoules.
Physical Gate Point	means a flange, joint or other point which marks a physical boundary between the ATCO Gas Australia GDS and an Interconnected Pipeline.
Physical Gate Point Costs	means all direct capital or operating costs incurred as a direct result of operating a Physical Gate Point and associated Gate Station to the extent that such costs were not included in formulating Conforming Capital Expenditure or Conforming Operating Expenditure for the Access Arrangement Period and it is demonstrated that the costs could not reasonably have been forecast.
Physical Gate Station	means the metering equipment site associated with a Physical Gate Point and includes all facilities installed at the site to perform over pressure protection, reverse flow protection, excessive flow protection, Gas metering and measurement and telemetry and all standby, emergency and safety facilities and all ancillary equipment and services.
Pipeline	has the meaning given to that term in section 2 of the National Gas Access Law.
Pipeline Service	has the meaning given to that term in section 2 of the National Gas Access Law.
Post-revision Pipeline Service	means a Pipeline Service that is specified in the Access Arrangement as a Reference Service after revisions have been made to the Access

	Arrangement in accordance with the Access Laws.
Previous Access Arrangement Period	means the Access Arrangement Period immediately preceding the Current Access Arrangement Period.
Prospective User	has the meaning given to that term in the National Gas Access Law.
Rate of Return	has the meaning given to that term under the National Gas Rules.
Receipt Point	for a Sub-network, means a point (which may be in the same physical location as a Physical Gate Point) which **<Service Provider>** has designated as a Receipt Point for that Sub-network.
Reconnecting a Delivery Point	means the Pipeline Service described in paragraph 4.11 of the Access Arrangement.
Reference Services	has the meaning given to that term in section 2 of the National Gas Access Law.
Reference Tariff	has the meaning given to that term in section 2 of the National Gas Access Law.
Reference Tariff A1	means the Tariff specified in Annexure A clause 1.1 of the Access Arrangement as the Reference Tariff for the Reference Service that is called "Service A1" in the Access Arrangement.
Reference Tariff A2	means the Tariff specified in Annexure A clause 1.2 of the Access Arrangement as the Reference Tariff for the Reference Service that is called "Service A2" in the Access Arrangement.
Reference Tariff B1	means the Tariff specified in Annexure A clause 1.3 of the Access Arrangement as the Reference Tariff for the Reference Service that is called "Service B1" in the Access Arrangement.
Reference Tariff B2	means the Tariff specified in Annexure A clause 1.4 of the Access Arrangement as the Reference Tariff for the Reference Service that is called "Service B2" in the Access Arrangement.
Reference Tariff B3	means the Tariff specified in Annexure A clause 1.5 of the Access Arrangement as the Reference Tariff for the Reference Service that is called "Service B3" in the Access Arrangement.
Reference Tariff Variation Mechanism	has the meaning given to that term in the National Gas Rules and for the purposes of this Access Arrangement means the mechanism for varying a Haulage Tariff set out in Annexure B and the mechanism for varying the Reference Tariffs relating to the Ancillary Services set out in Annexure C.
Regulator	has the meaning given to that term in section 2 of the National Gas Access Law.
Regulatory Change	means a change in, the removal of, or the imposition of, a Regulatory Obligation or Requirement (as defined in section 6 of the National Gas Access Law) imposed on ATCO Gas Australia and, without limiting section 6 of the National Gas Access Law, includes: (a) a community service obligation; (b) a changed, additional, or new environmental, safety, technical, accounting, operating or administrative standard or requirement; (c) a uniform Tariff obligation or any other restriction on the level of Tariffs;

	(d) a licensing requirement; or (e) a required fee or required charge paid or payable, or a change to the amount of the required fee or charge paid or payable, to the ERA for a licence or any other membership, required contribution or other direct charge required by a regulatory body or agency; to the extent that such changes were not included in formulating Conforming Capital Expenditure or Conforming Operating Expenditure for the Access Arrangement Period and it is demonstrated that the changes could not reasonably have been forecast.
Regulatory Costs	means direct costs as a result of: (a) a Regulatory Obligation or Requirement (as defined in section 6 of the National Gas Access Law) that are demonstrated to have reasonably been excluded from forecast Conforming Capital Expenditure or forecast Conforming Operating Expenditure for the Access Arrangement Period; (b) ATCO Gas Australia's compliance with the National Gas Access (Western Australia) Legislation, its Distribution Licence, the *Energy Coordination Act 1994* (WA), the *Gas Standards Act 1972* (WA), the *Energy Operators (Powers) Act 1979* (WA), the *Environmental Protection Act 1986* (WA), and its compliance with all other applicable Laws and with the requirements of any government department, agency or authority operating in accordance with those Laws to the extent such cost can be demonstrated to have been reasonably excluded from the forecast Conforming Capital Expenditure or forecast Conforming Operating Expenditure.
Regulatory Event	has the meaning given to that term in clause 13.6(a) of the Haulage Contract.
Regulatory Event Notice	has the meaning given to that term in clause 13.6(a)(iii) of the Haulage Contract.
Regulatory Instruments	means: (a) the Access Laws; (b) the Distribution Licence; (c) the Access Arrangement; (d) the Retail Market Rules; (e) the Energy Coordination Act 1994 (WA); (f) the Energy Coordination (Customer Contracts) Regulations 2004 (WA); (g) the Energy Coordination (Gas Tariffs) Regulations 2000 (WA); (h) the Energy Coordination (General) Regulations 1995 (WA); (i) the Energy Coordination (Higher Heating Value) Regulations 2008 (WA); (j) the Energy Coordination (Last Resort Supply) Regulations 2005 (WA); (k) the Energy Coordination (Licensing Fees) Regulations 1999 (WA); (l) the Energy Coordination (Ombudsman Scheme) Regulations 2004 (WA);

	(m) the Energy Coordination (Retail Market Schemes) Regulations 2004 (WA); (n) the Energy Coordination Regulations 2004 (WA); (o) the Energy Operators (Powers) Act 1979 (WA); (p) the Environmental Protection Act *1986* (WA); (q) the Gas Marketing Code of Conduct 2014 (WA); (r) the Gas Standards Act 1972 (WA); (s) the Gas Standards Regulations; (t) the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 (WA); and (u) the Gas Standards (Infringement Notices) Regulations 2007 (WA); and (v) any other Laws applicable to ATCO Gas Australia in its ownership and operation of the ATCO Gas Australia GDS under the Distribution Licence and provision of Pipeline Services by means of the ATCO Gas Australia GDS, and **Regulatory Instrument** means any one of them.
Related Body Corporate	has the meaning given to that term in section 9 of the *Corporations Act 2001* (Cth).
Related Shipper	in relation to a User for a Sub-network, means a person who, from time to time, is named in the User's allocation instruction for the Sub-network under the Retail Market Rules, and to avoid doubt, a User may be its own Related Shipper.
Relevant Tax	means any Tax the effect of which was properly taken into account (directly or indirectly) when setting Haulage Tariffs, as affecting an amount which ATCO Gas Australia is or will be required to pay in relation to its supply of one or more Haulage Services.
REMCo	means the Retail Energy Market Company Limited (ABN 15 103 318 556), or any other corporation managing the Retail Market Scheme.
REMCo Registry	has the meaning given to that term in the Retail Market Rules, as amended from time to time, or any other scheme applying to the gas retail market.
Removing a Meter Lock	means the Pipeline Service described in paragraph 4.9 of the Access Arrangement
Response Notice	has the meaning given to that term in clause10.3(c) of the Haulage Contract.
Retail Market Rules	means the rules applying under the Retail Market Scheme, as amended from time to time, or any other scheme applying to the gas retail market.
Retail Market Scheme	means the retail market scheme, including the Retail Market Rules, approved under section 11ZOJ of the *Energy Coordination Act 1994* (WA) as applying in respect of the ATCO Gas Australia GDS, as amended from time to time, or any other scheme applying to the retail energy market.
Revenue and Pricing Principles	has the meaning given to that term in section 2 of the National Gas Access Law.

Review Submission Date	means the date specified in paragraph 2.2 (a) of the Access Arrangement
Revision Commencement Date	means the date specified as the Revision Commencement Date in clause 2.2 (b) of the Access Arrangement.
Rule	means a reference to the National Gas Rules (NGR)
Safety Case	*WAGN Gas Distribution System Safety Case - GD PL 0130*
SAIFI	means the System Average Interruption Frequency Index is commonly used as a reliability metric to indicate the average number of interruptions that a customer would experience in a year
SL CAPM	means Sharpe Lintner Capital Asset Pricing Model
Service A1	is the Pipeline Service described in Part 4 of the Access Arrangement and clause 1 of Schedule 1 of the Haulage Contract.
Service A2	is the Pipeline Service described in Part 4 of the Access Arrangement and clause 1 of Schedule 2 of the Haulage Contract.
Service B1	is the Pipeline Service described in Part 4 of the Access Arrangement and clause 1 of Schedule 3 of the Haulage Contract.
Service B2	is the Pipeline Service described in Part 4 of the Access Arrangement and clause 1 of Schedule 4 of the Haulage Contract.
Service B3	is the Pipeline Service described in Part 4 of the Access Arrangement and clause 1 of Schedule 5 of the Haulage Contract.
Service Agreement	means a Haulage Contract or any other agreement entered into between ATCO Gas Australia and a User under which ATCO Gas Australia agrees to provide a Pipeline Service to the User.
Service Pipe	means the pipe and associated fittings which connect a Delivery Point to the main.
Service Provider	has the meaning given to that term under the National Gas Access Law and, for the purposes of the Haulage Contract, ATCO Gas Australia is a Service Provider for the ATCO Gas Australia GDS and also the Covered Pipeline Service Provider for the ATCO Gas Australia GDS.
Small Use Customer	has the meaning given to that term in section 3 of the *Energy Coordination Act 1994* (WA).
Spare Capacity	has the meaning given to that term in the National Gas Access Law.
Standard 8m^3/h Meter	means a standard Meter with a badged capacity of not more than 8 cubic metres of Gas per hour, being the standard facility or facilities adopted for the purpose of this definition as specified from time to time by **<Service Provider>**.
Standard 10m^3/h Meter	means a standard Meter with a badged capacity of not more than 10 cubic metres of Gas per hour, being the standard facility or facilities adopted for the purpose of this definition as specified from time to time by **<Service**

	Provider>.
Standard $12m^3$/h Meter	means a standard Meter with a badged capacity of not more than 12 cubic metres of Gas per hour, being the standard facility or facilities adopted for the purpose of this definition as specified from time to time by **<Service Provider>**.
Standard $18m^3$/h Meter	means a standard Meter with a badged capacity of not more than 18 cubic metres of Gas per hour, being the standard facility or facilities adopted for the purpose of this definition as specified from time to time by **<Service Provider>**.
Standard Delivery Facilities	means, for a User acquiring access to Service B1, Service B2 or Service B3 under the Haulage Contract: (a) in the case of Service B1: (i) may take delivery of Gas at a Delivery Point on the Medium Pressure/Low Pressure System using a standard Meter with a badged capacity of 18 m^3/h or greater including a Standard 18 m^3/h Meter; (ii) Service Pipe from the main to the Delivery Point; (iii) a Standard Pressure Regulator, sized to suit the applicable Meter; and (iv) any ancillary pipes and equipment (including a valve or valves); (b) In the case of Service B2 and Service B3, either: (i) in the case of Service B2, a standard Meter with a badged capacity of $12m^3$/h or greater and less than 18 m^3/h including a Standard $12m^3$/h Meter; or (ii) in the case of Service B3, a standard Meter with a badged capacity of less than $12m^3$/h including a Standard $8m^3$/h Meter and a Standard $10m^3$/h Meter ; and (iii) up to 20 metres of Service Pipe; (iv) a Standard Pressure Regulator, sized to suit the applicable Meter; (v) any ancillary pipes and equipment (including a valve or valves); and (vi) installation of items (a) to (d) above in Standard Site Conditions, being the standard facility or facilities adopted for the purposes of this definition and specified from time to time by **<Service Provider>**.
Standard Pressure Regulator	means a pressure regulator or regulators provided by ATCO Gas Australia as part of Service B2 and Service B3 which is or are the standard facilities adopted for the purposes of this definition as specified from time to time by **<Service Provider>**.
Standard Site Conditions	means, in the reasonable opinion of **<Service Provider>**, that the land or premises at or through which the Standard Delivery Facilities are being installed: (a) does not have rock or any other hard formation present;

	(b) does not have tiered or terraced gardens or retaining walls present; (c) does not require traffic management (including traffic management to allow safe access or working on or in the land or premises adjacent to the land or premises at or through which the Standard Delivery Facilities are being installed); (d) does not require horizontal directional drilling or boring; and (e) is not densely vegetated, and only where the gas main is so located that, in the reasonable opinion of **<Service Provider>,** it is practicable in accordance with good industry practice to connect the Standard Delivery Facilities to the main.
Standing Charge	means: (a) for Tariff A1, the amount specified in clause 1.1 (b) (i) of Annexure A of the Access Arrangement; (b) for Tariff A2, the amount specified in clause 1.2 (b) (i) of Annexure A of the Access Arrangement; (c) for Tariff B1, the amount specified in clause 1.3 (b) (i) of Annexure A of the Access Arrangement; (d) for Tariff B2, the amount specified in clause 1.4 (c) (i) of Annexure A of the Access Arrangement; (e) for Tariff B3, the amount specified in clause 1.5 (c) (i) of Annexure A of the Access Arrangement.
Sub-network	means a part of the ATCO Gas Australia GDS identified under the Retail Market Rules as a sub-network of the ATCO Gas Australia GDS.
Surcharge	has the meaning given to that term in the National Gas Rules.
Swing Service Provider	has the meaning given to that term in rule 2 of the Retail Market Rules.
System Pressure Protection Plan	means a plan prepared by a Prospective User that complies with the requirements set out in Annexure D of the Access Arrangement to ensure **<User>** does not jeopardise system pressure by being in a position where it is unable to supply sufficient Gas at Receipt Points on a Sub-network and is simultaneously unable to sufficiently reduce the delivery of Gas it takes at its Delivery Points on the Sub-network.
Tariff	has the meaning given to it in section 2 of the National Gas Access Law.
Tariff A1	means the Tariff or Charge specified in, or determined by applying the formula or methodology contained in, the Access Arrangement, Annexure A clause 1.5, as varied under the Reference Tariff Variation Mechanism .
Tariff A2	means the Tariff or Charge specified in, or determined by applying the formula or methodology contained in, the Access Arrangement, Annexure A clause

	1.2, as varied under the Reference Tariff Variation Mechanism.
Tariff B1	means the Tariff or Charge specified in, or determined by applying the formula or methodology contained in, the Access Arrangement, Annexure A clause 1.3 , as varied under the Reference Tariff Variation Mechanism.
Tariff B2	means the Tariff or Charge specified in, or determined by applying the formula or methodology contained in, the Access Arrangement, Annexure A clause 1.4 , as varied under the Reference Tariff Variation Mechanism.
Tariff B3	means the Tariff or Charge specified in, or determined by applying the formula or methodology contained in, the Access Arrangement, Annexure A clause 1.5, as varied under the Reference Tariff Variation Mechanism.
Tariff Component	means a component of a Haulage Tariff which is an amount, or the rate by, which a User is charged for a single element or attribute of a Haulage Service.
Tax	includes any tax, rate, impost, levy, fee, compulsory loan, tax-equivalent payment or surcharge withheld, deducted, charged, levied or imposed under any Law (**Applicable Tax**) other than any: (a) Applicable Tax imposed under the GST Law; (b) Applicable Tax imposed on any income or capital amounts that may be derived by a Party; or (c) Duty.
Tax Change	means: (a) a change in the way, or the rate at which, a Relevant Tax is calculated; (b) the removal of a Relevant Tax; or (c) the imposition of a New Relevant Tax, which results from a Change in Law or a Regulatory Change
Telemetry	means the communication equipment used for transmission of data collected from a Meter to ATCO Gas Australia's central data management system and typically encompasses modems, telecom landline (which may be dedicated or part of the PSTN network) or radio transceivers (which may be in the form of a dedicated radio network, GSM, GPRS or satellite telephony).
Template Haulage Contract	refers to the Template Haulage Contract at Annexure E.
Terajoule	means 1000 (one thousand) Gigajoules.
Third Party	has the meaning given to that term in 14.2 of the Haulage Contract.
Total Revenue	has the meaning given to that term in the National Gas Rules.
UAFG	means unaccounted for gas which is the difference between measured inflows of Gas into the ATCO Gas Australia GDS and measured outflows of Gas from the ATCO Gas Australia GDS.

Usage Charge	means: (a) for Tariff A1, the charge described in clause1.1 (a) (iii) of Annexure A of the Access Arrangement ; (b) for Tariff A2, the charge described in clause 1.2 (a) (ii) of Annexure A of the Access Arrangement; (c) for Tariff B1, the charge described in clause 1.3 (a) (ii) of Annexure A of the Access Arrangement; (d) for Tariff B2, the charge described in clause 1.4 (a) (ii) of Annexure A of the Access Arrangement (e) for Tariff B3, the charge described in clause1.5 (a) (ii) of Annexure A of the Access Arrangement.
Usage Charge Rate	means: (a) for Tariff A1, the rate specified in clause 1.1 (b) (iii) of Annexure A of the Access Arrangement; (b) for Tariff A2, the rate specified in clause1.2 (b) (ii) of Annexure A of the Access Arrangement; (c) for Tariff B1, the rate specified in clause1.3 (b) (ii) of Annexure A of the Access Arrangement ; (d) for Tariff B2, the rate specified in clause1.4 (b) (ii) of Annexure A of the Access Arrangement ; (e) for Tariff B3, the rate specified in clause1.5 (b) (ii) of Annexure A of the Access Arrangement.
User	has the meaning given to it in the National Gas Access Law and, for the purposes of the Haulage Contract, **<User>** is a User.
User Specific Charge	means: (a) for Tariff A1, the charge described in clause 1.1 (b) (iv) of Annexure A of the Access Arrangement (b) for Tariff A2, the charge described in clause 1.2 (b) (iii) of Annexure A of the Access Arrangement; (c) for Tariff B1, the charge described in clause 1.3 (b) (iii) of Annexure A of the Access Arrangement.
User Specific Delivery Facilities	means, for a User acquiring access to Service A1, Service A2 or Service B1 under the Haulage Contract: (c) a Meter which is not a Standard $8m^3/h$ Meter, a Standard $10m^3/h$ Meter, a Standard $12m^3/h$ Meter or a Standard meter with a badged capacity of less than $18m^3/h$; (d) Service Pipe from the main to the Delivery Point; (e) a User Specific Pressure Regulator; (f) any ancillary pipes and equipment (including a valve or valves);

	(g) in the case of Service B1, may take delivery of Gas at a Delivery Point on the Medium Pressure/Low Pressure System using Standard Delivery Facilities which include a Standard 18 m^3/h Meter or a standard Meter with a badged capacity of more than 18 m^3/h; and (h) in the case of Service A1 and Service A2, also includes Telemetry, being the facility or facilities which are the most appropriate for that User, as determined by **<Service Provider>** as a reasonable person.
User Specific Pressure Regulator	means a pressure regulator which is not a Standard Pressure Regulator.
Variation Period	refers to one of the following periods (as the case may be): (a) the year commencing 1 July 2013; (b) the Year commencing 1 July 2014; or (c) the Year commencing 1 July 2015.
WACC	Weighted Average Cost of Capital.
Year	means a period of 12 months.