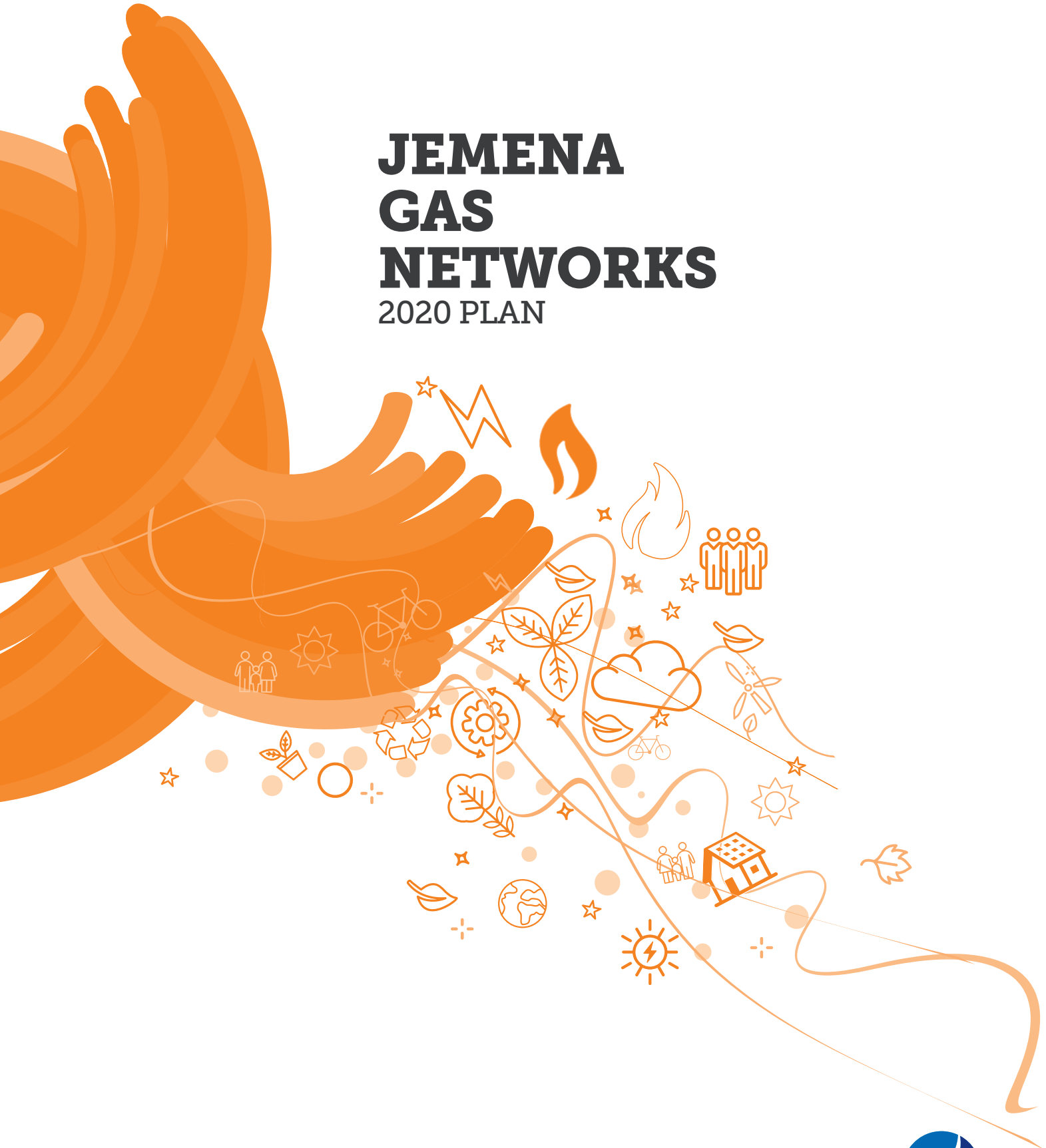
JEMENA GAS NETWORKS
2020 PLAN



Jemena
bringing energy to life

JEMENA GAS NETWORKS (NSW) LTD
2020-25 ACCESS ARRANGEMENT REVIEW

Monetary values are reported in the value of a dollar in 2020 and exclude the impacts of inflation.

The 2020 Plan and its associated attachments comprise the Access Arrangement Information.

DELIVERING A MORE AFFORDABLE GAS SUPPLY

It is pleasing to see the extent to which the development of Jemena Gas Networks' 2020 Plan was led by our customers.

Members of the Board and I have been encouraged by the number of meetings, engagements and opportunities across New South Wales (NSW) which residents, small business owners and large industrial users have had to speak directly with members of the Jemena team as they developed this 2020 Plan.

As the largest gas network in Australia, it was important for us that we approached this review through the lens of the customer to fully understand the challenges they face. I believe the customer engagement process has made us a better company.

By listening, hearing and thinking about what our customers have said, right across the state, we are in a position to deliver a submission to the Australian Energy Regulator (AER) that has truly been shaped and endorsed by our customers.

Customers consistently told us that their number one issue was affordability. This 2020 Plan, which we are submitting to AER, will help drive down price pressure.

We heard from our customers that they want us to innovate and plan for the future so they can continue to enjoy the benefits of using gas. Our 2020 Plan outlines initiatives which are aimed at ensuring the continued competitiveness and sustainability of our network in a low carbon-future.

As the new Chair of the Board, I will be working with Board members, and everyone at Jemena to continue to work with customers in order to provide reliable, affordable and sustainable gas in NSW.

Jiang Longhua
Chair of the Board
SGSPAA (parent company of Jemena)

Since we commenced preparations for developing our 2020 Plan, we have been listening to a diverse range of customers across NSW about what they value from their gas service.

Our customers told us that they love using gas, and that they believe it provides value for money, but they are concerned about increasing energy prices. They want us to focus on affordability in the short term, but they don't want this at the expense of the service levels that they currently receive. Over the long-term, customers told us that price will remain important but they also want to address climate change for future generations.

The response from our customers provides a strong direction that decisions being made today must consider the impact on the community as a whole, and future gas customers.

In January 2019, we published a draft version of this 2020 Plan for consultation to test whether we had accurately heard and understood the preferences of our customers, and to check whether we had appropriately implemented their feedback into our plans. I am pleased to say that during further consultation with our customers they confirmed their support for our 2020 Plan. During this consultation I was able to meet and hear directly from our customers. I was greatly encouraged to hear that they had enjoyed and valued their ability to influence our plans, and that they believed Jemena was operating in their long-term interests.

Our 2020 Plan is our attempt at continuing to enhance the long-term value of gas for our customers. It intends to find the right balance between delivering lower prices now, and a sustainable future for the communities we serve.

I am pleased that our 2020 Plan proposes to put downward pressure on gas bills across NSW. Over the 2020-25 period, a typical residential customer will save approximately $244. Recognising the pressures that our business customers face, our 2020 Plan will also deliver average savings of approximately 18% to our commercial and industrial customers.

Frank Tudor
Managing Director

SHORT ON TIME?

This document is a summary of what we have learned from our customers, and how we have taken into account their feedback and built a strategy for our network for the next regulatory period, which runs from 1 July 2020 to 30 June 2025.

The theme of affordability runs through every aspect of our 2020 Plan. It is an issue that almost every customer and stakeholder raised with us during our comprehensive engagement program, and one that we have endeavoured to consider in our pricing, proposed investments, services and operating costs.

What our 2020 plan means for customers

Our 2020 Plan includes a number of strategic initiatives that will deliver reductions in our network prices over the 2020-25 period, continuing the trend we began in 2015-16.

These price reductions exclude the impact of inflation and are presented, as is other financial information throughout this 2020 Plan, using the value of a dollar in 2020.

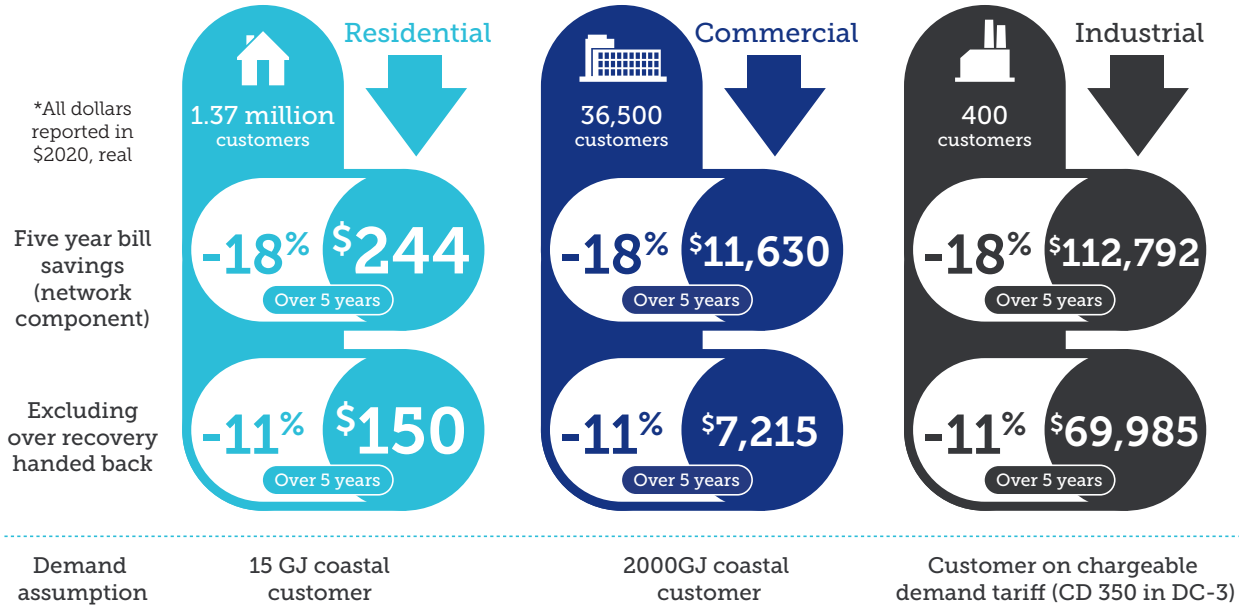
In isolation, our Plan will result in bill decreases of 11% over the 2020-25 period, or $150 for a typical residential customer (see Figure X.1).

In addition, over 2020-25 we will return some revenue we received in the current period, which will further lower bills.[1] In total over the five years, the network component of a typical residential bill will reduce by 18%, or $244.

Customers who participated in engagement taking a well-earned break

1 As a result of uncertainty following our last price review, which has only recently been resolved with the AER, we were allowed to recover more revenue than we required in the current period. This is called over recovery. To aid transparency, bill impacts are shown with and without the impacts of this hand back of revenue. See section 7.7 for details.

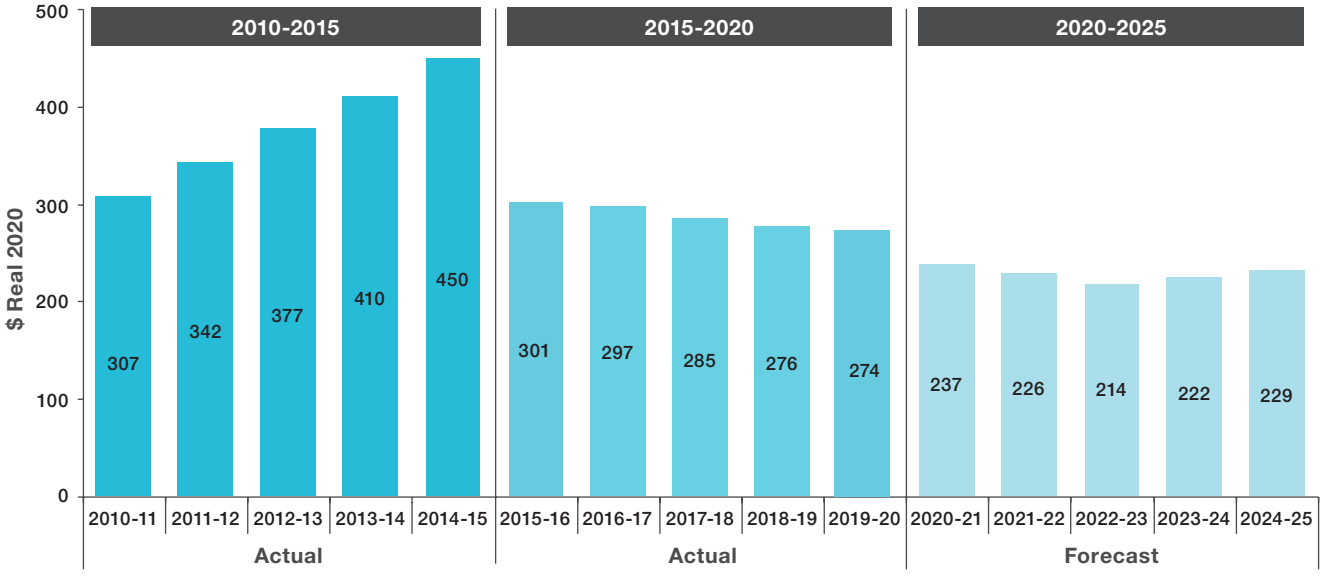
Figure X.1 Network bill impacts of our 2020 Plan (excluding the impact of inflation)



Other than wanting an affordable service, our customers shared concerns about how price fluctuations in the cost of services like gas negatively impact their ability to manage their household budgets. They wanted us to work towards a goal of achieving a smooth retail bill. So we have also incorporated this request in profiling our cost recovery across the five year period.

Figure X.2 shows a typical residential customer's annual network bills under our proposal. This provides our best effort to contribute to smooth retail bills by mitigating forecast increases in wholesale gas prices, while handing back the over recovered revenue and minimising price impacts after 2025.

Figure X.2 A typical residential customer's network bill (2010-11 to 2024-25)



Note: (1) The network bill is based on a typical residential customer on a coastal tariff with 15GJ/annum consumption (2) The significant drop in prices between 2014-15 and 2015-16 was largely driven by a drop in our funding costs. When we made our 2010 Plan, interest rates were high due to financial market conditions at the time (the global financial crisis). When we made our 2015 Plan, conditions had improved and these rates came down.

What our customers have told us

In designing our engagement program for our 2020 Plan, we identified three key objectives.

Figure X.3 Key engagement objectives

In order to ensure that our customers' views shape our 2020 Plan, we started our engagement program close to two years ago. During that time, we consulted with a range of customers—from residential all the way through to large industrial—to understand what they need from the gas network now, and in the future.

We held forums with residential customers in cities across NSW that we specifically selected because of the diversity of their customer base. Those forums were adapted to suit the types of customers invited to best facilitate engagement. During the process, we also ran two forums in Arabic so that we could hear the views of a community in Fairfield.

For small business customers, we also ran forums in Sydney, in regional areas, and with those in the restaurant and hospitality field who were from culturally and linguistically diverse backgrounds. Where needed, we conducted interviews in Arabic, Hindi, Cantonese and Mandarin.

Our large business customers told us they wanted to engage one-to-one, during regular business-as-usual meetings and also at our annual large-customer forum.

Throughout the course of our engagement program, our customers have provided their views and insights on what they want and value about their gas service, and what they would like us to prioritise as we plan for the future.

Our customers challenged us. They told us that they enjoy cooking and heating with natural gas. They told us they want affordable zero carbon gas to be available not only for themselves but also for the next generations. Our proposal will take the first steps towards achieving this.

We have used this feedback, which can be summarised into four key themes (shown over the following two pages), to help shape our plans.

We have heard that affordability is a key issue for our customers and that network businesses have a key role in keeping price down.

Our 2020 Plan will deliver network price reductions by:

- connecting approximately 130,000 new customers to our network, which means we can spread our costs across a larger customer base;
- implementing a transformation program to reduce our operating cost base and challenging ourselves to deliver additional operating cost productivity improvements of 0.74% each year;
- implementing the AER's rate of return instrument;
- reducing the growth in our asset base, which will help to keep prices down over the longer term; and
- offering large-industrial customers the opportunity to reset their charges if they have reduced their peak gas consumption over the past five years (by offering a reset of Chargeable Demand).

Our proposed price path also takes account of our customers' views that we should balance our prices across the five years to counter expected movements in other areas of the supply chain, with the goal of achieving a smooth retail bill.

Our customers told us that they value and expect a safe and reliable gas service.

This means that:

- we do not compromise on the safety of our customers, the public or our employees;
- gas is available when it is needed, and service disruptions are kept to a minimum;
- we minimise the time to respond to supply disruptions and to reconnect customers;
- new customers can connect to our network in a timely manner and within agreed timeframes; and
- we will engage with customers and communities to support and implement new investments, deliver innovative energy solutions and manage operations in line with their expectations.

Our proposed capital and operating expenditure programs will enable us to deliver on this commitment while also ensuring that our services remain cost-effective.

Our customers want us to consider fairness in the context of:

- our existing and future customers;
- the service levels that they receive; and
- the different needs of our diverse customers from across the state.

This means that we will:

- provide common minimum levels of service to all customers across NSW;
- retain our current approach to city/country pricing, so only customers benefiting from the Sydney trunk will pay for it; and
- take appropriate actions now to respond to uncertainty around the long-term future of the gas network, so that future customers are not unfairly impacted. This includes a proposal to speed up the recovery of our new investments.

Our customers told us that they expect us, and other parts of the energy industry, to innovate and plan for the future so that they can continue to use gas in the longer term, as we move to a zero-carbon future.

Our Power to Gas project, the Western Sydney Green Gas Trial, is one example of how we are innovating for a greener energy future. The trial, which is co-funded by Jemena and the Australian Renewable Energy Agency (ARENA), will convert solar and wind power into hydrogen gas, via electrolysis. The hydrogen gas will then be injected into our network.

Our costs for this trial are not included within our 2020 Plan—and we will not seek to recover hydrogen or future fuel innovation costs until the trial is successful and the technology is capable of being utilised within our network.

Although our customers expect us to do what we can to ensure that gas remains a sustainable fuel choice into the future, other stakeholders indicated that they did not support us proposing a separate innovation scheme at this time. We have therefore not proposed an innovation scheme as part of our 2020 Plan.

Customer views on our 2020 Plan

In January 2019, we published a draft version of our 2020 Plan for customer consultation. Our aim in publishing our Draft 2020 Plan was to make sure we had correctly understood what our customers told us, and that the decisions we propose to make about our services, costs and prices, accurately reflect their priorities and long-term interests.

Once the Draft 2020 Plan was published we resumed our interactions with residential customers who were part of our 2018 engagement program. This included customers from across NSW, as well as customers who had attended our forums in Arabic. Our aim was to understand whether or not we had accurately captured and applied the feedback we had received. We also sought to further develop our understanding of their preferences, particularly in relation to some parts of our capital expenditure program. Finally, we asked our customers whether they felt that our Draft 2020 Plan was reflecting customers' long-term interests'.

Voting by our customers at these forums confirmed that an overwhelming majority of our customers felt that our Draft 2020 Plan was in their long term interests. They also confirmed that we had responded either "very well" or "quite well" to their feedback on the four key themes of affordability, a safe and reliable gas service, fairness and the future.

We also held a webinar for our large users to brief them on our Draft 2020 Plan and invite feedback.

As a result of the feedback we received from our customers, we have not made significant changes to the Draft 2020 Plan published in January. The updates we have made have primarily been to reflect new or updated data and information.

We also received written submissions on our Draft 2020 Plan from the Public Interest Advocacy Centre (PIAC) and Energy Consumers Australia (ECA). We have sought to respond to the issues and questions raised in these submissions throughout our 2020 Plan and its attachments.

An uncertain future

We are developing this 2020 Plan during a period of unprecedented change in the Australian energy market. Many of these changes have important implications for our customers, and for our business, both in the short and longer term.

In recent years, we have seen significant growth of the Queensland Liquified Natural Gas (LNG) export market. In addition, onshore gas development bans and restrictions are currently in place in Victoria and NSW respectively. Together, these have put upward pressure on east-coast gas supplies and resulted in a step-change in domestic wholesale gas prices.

In December 2015, 195 countries, including Australia, agreed on the United Nations Paris Agreement on climate change. For the first time in history, both developed and developing countries committed to reducing the amount of carbon dioxide they emit into the atmosphere.

In line with the Paris Agreement, Australia has committed to transition to a low carbon future, and the Federal Government has set a target to reduce carbon emissions by 26-28% on 2005 levels, by 2030. Additionally, state governments have set emission targets of their own—including the NSW Government—which has set a net-zero carbon emissions target by 2050.

While natural gas has historically been promoted as the low-carbon energy option, these changes mean that the long-term future of natural gas is no longer assured—as it contains carbon. Although we have recently seen significant growth in customers connecting to our network, driven by the NSW housing boom, it is possible that government policy changes to meet this target could make the gas network too expensive to be competitive in the long term, or make continued operation of the network infeasible.

Our strategic response

We are responding to these challenges by building a more commercial and competitive business, and delivering fair outcomes across the communities we serve. Key to this is our vision to maximise the sustainability of our gas network by connecting customers to the low-carbon energy future, and our Gas Market Strategy (see Figure X.4).

We believe that our 2020 Plan will help us work towards achieving our gas markets vision by:

- driving sustainable cost reductions—without compromising safety or reliability—to put downward pressure on bills;
- innovating for a zero-carbon gas future by readying our network to transport low-carbon gas;
- delivering balanced outcomes across household and business customers, current and future generations, and city and regional areas of NSW; and
- connecting 130,000 new customers to our network, and continuing to promote gas as a competitive fuel choice, which will help to lower bills in the future.

The initiatives we are proposing in the next regulatory period

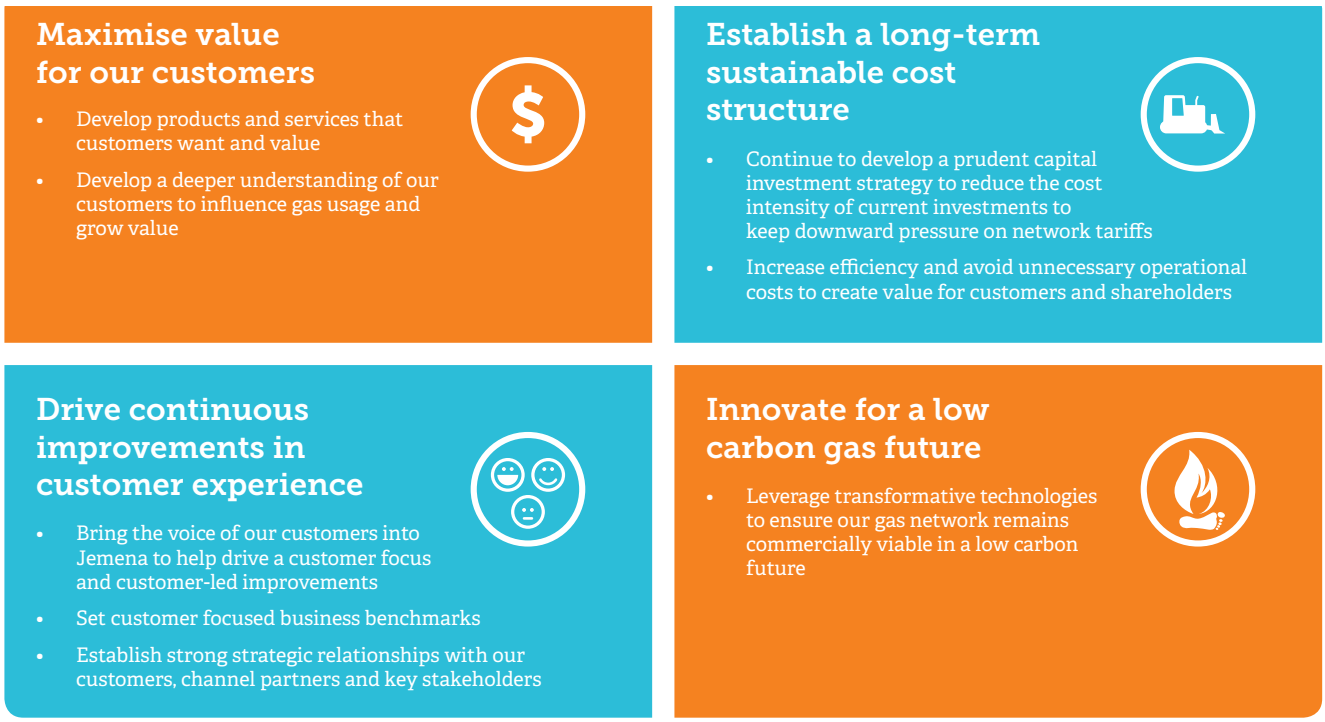
In our 2020 Plan, we discuss the strategic initiatives that we propose for the next regulatory period, to improve our cost competitiveness, deliver balanced outcomes into the future, and work towards a zero-carbon future.

In line with our open and transparent approach, we have shown the impact that each of these initiatives will have on customer bills, and have even shown that three of them—if viewed in isolation—would actually increase bills in the short term. However, when viewed as a package, they deliver the sustainability, reliability and particularly the affordability our customers have asked for.

To provide a more complete picture, we have also made reference to the initiatives we have investigated but decided not to proceed with, and why.

The details of all these initiatives can be found in section 3.3.

Figure X.4 Jemena's Gas Market Strategy



The revenue we require

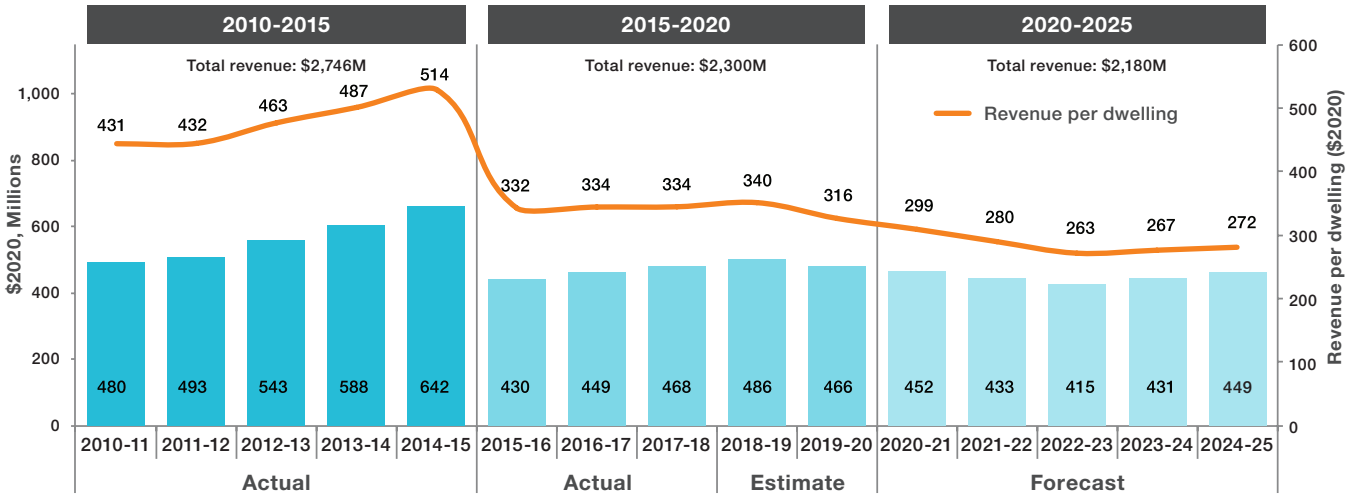
We recover the costs of providing our distribution network services from the customers who use them. We do this by charging for these services through our network prices.

Due to the growth in customers connecting to our network and our actions to deliver sustainable cost reductions, the average revenue we require per customer to deliver our plan will fall when compared to the 2015-20 period.

This is good for our customers, as these reductions will be passed on through lower network prices.

To deliver our 2020 Plan, we are seeking $2,360M in revenue over five years. When combined with the revenue we are handing back to customers, our proposed revenue will decrease, to $2,191M (which is equivalent to $2,180M when smoothed across the five years). This compares to proposed revenues in our Draft 2020 Plan of $2,185M.

Figure X.5 Our revenue requirements over the 2010 to 2025 period (smoothed)

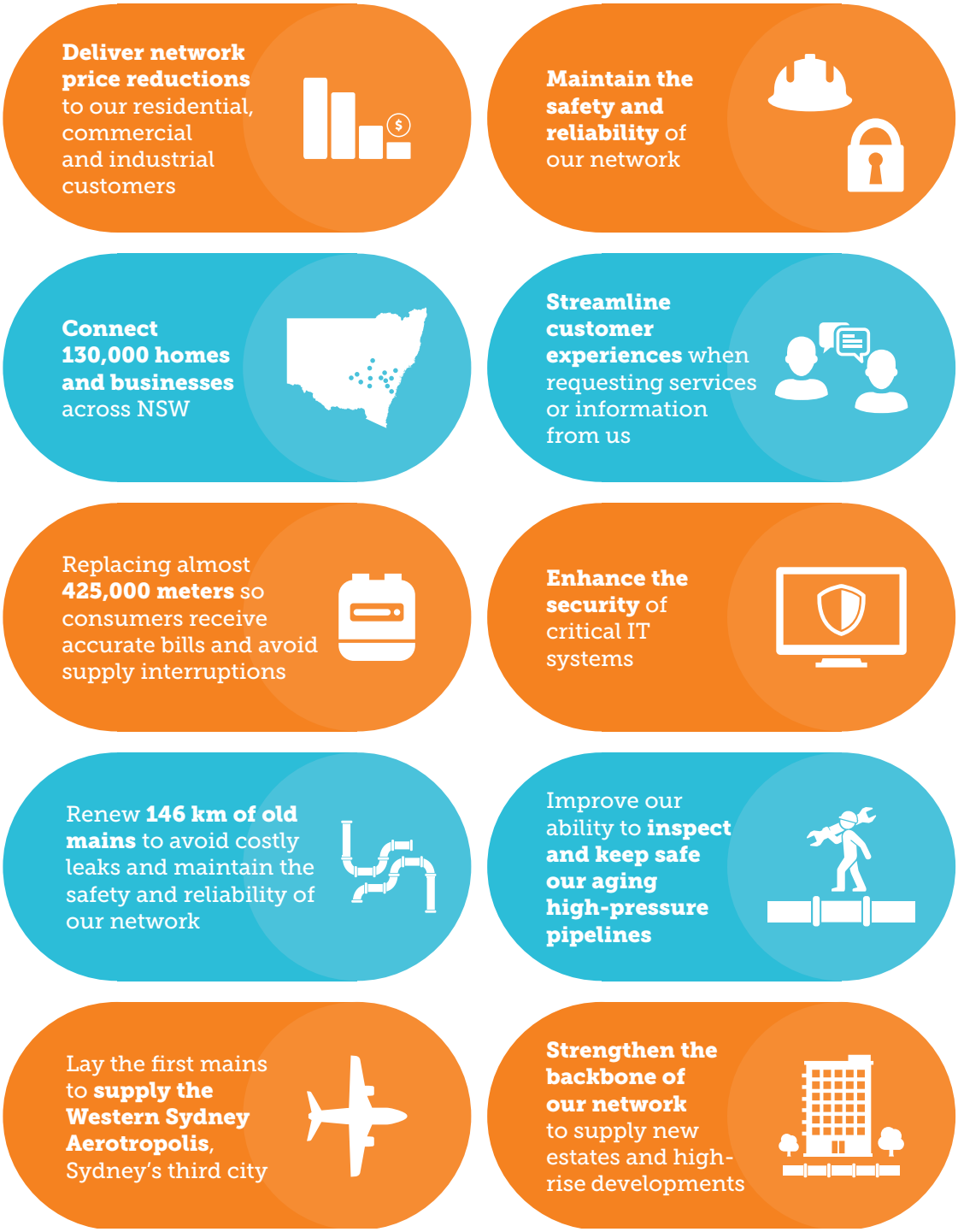


Note: (1) From 1 July 2020, we are proposing that newly constructed apartment buildings with a centralised hot water system will only be able to connect through a single boundary meter. This means a single connection will supply on average about 88 units. This significantly reduces how many connections we make for each high-rise dwelling. To present data on a consistent basis over the 2011-25 period, we have used a revenue per dwelling rather than revenue per customer metric. (2) In 2020-25, we will return approximately $169M of revenue we received from customers in the current period. This hand back will be made by adjusting our 2020-25 revenue (see section 7.7 for details)

What our plan will deliver for our customers

This revenue will enable us to continue providing our customers with the safe, reliable and affordable services they expect, and deliver the outcomes set out below.

Figure X.6 What our 2020 Plan will deliver



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HALAL.حلال
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Combo
Falafel Roll
Falafel Plat

01

Background
to our 2020 Plan

1.1 About Jemena

Jemena Gas Networks (JGN) is Australia's largest and one of the fastest growing gas distribution networks.

We own and manage the 25,000 kilometres of pipelines that distribute natural gas to almost 1.4 million homes and businesses across NSW. Figure 1.1 shows our network footprint.

We transport gas through our network on behalf of network users, such as retailers, to customers' premises. We also read and maintain the meters that measure how much gas is being used by each customer. We are part of a broader energy supply chain that spans from gas production to retailing, and our charges make up around 40% of a typical residential customer's gas bill (see Figure 1.2).

Figure 1.1 JGN's network

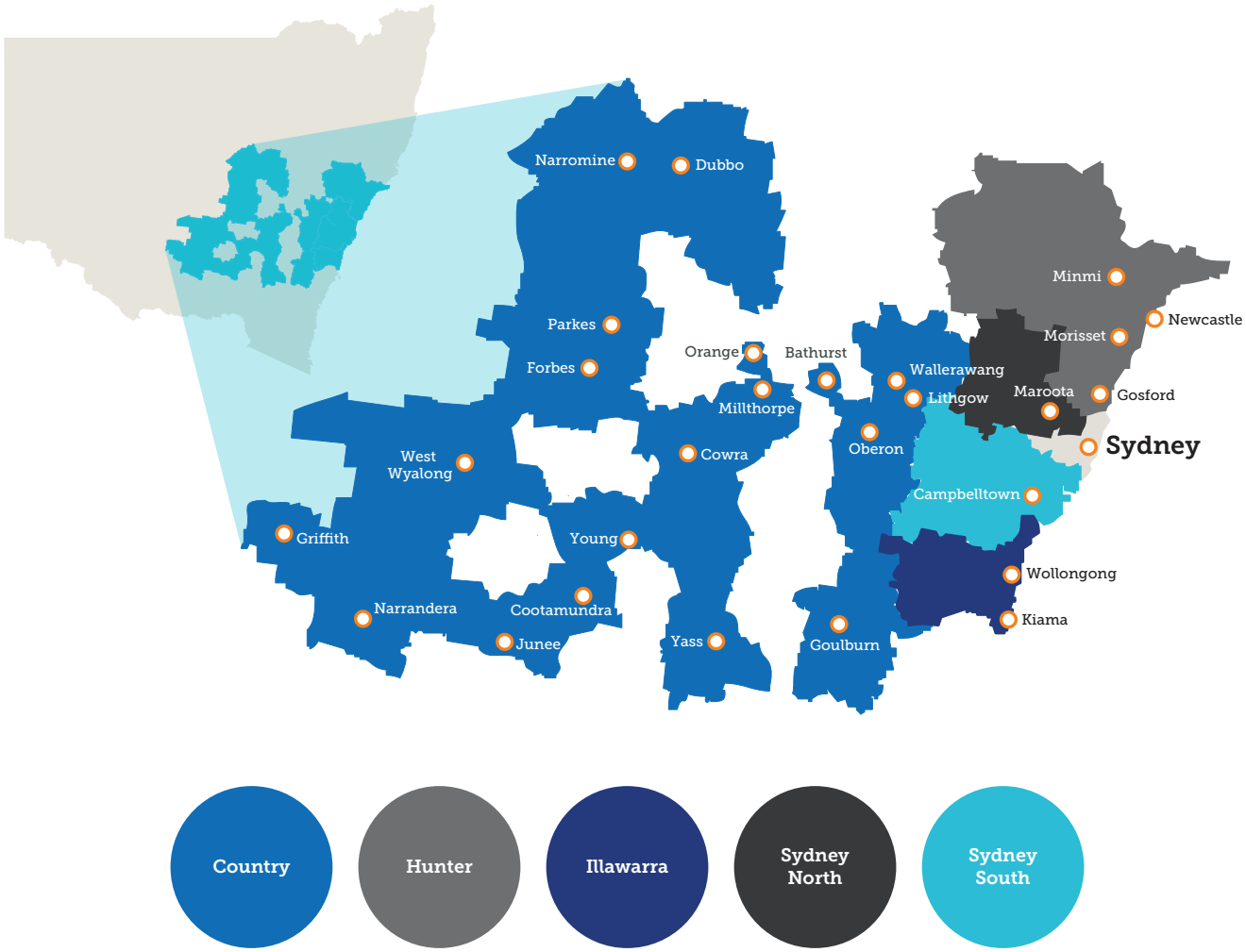
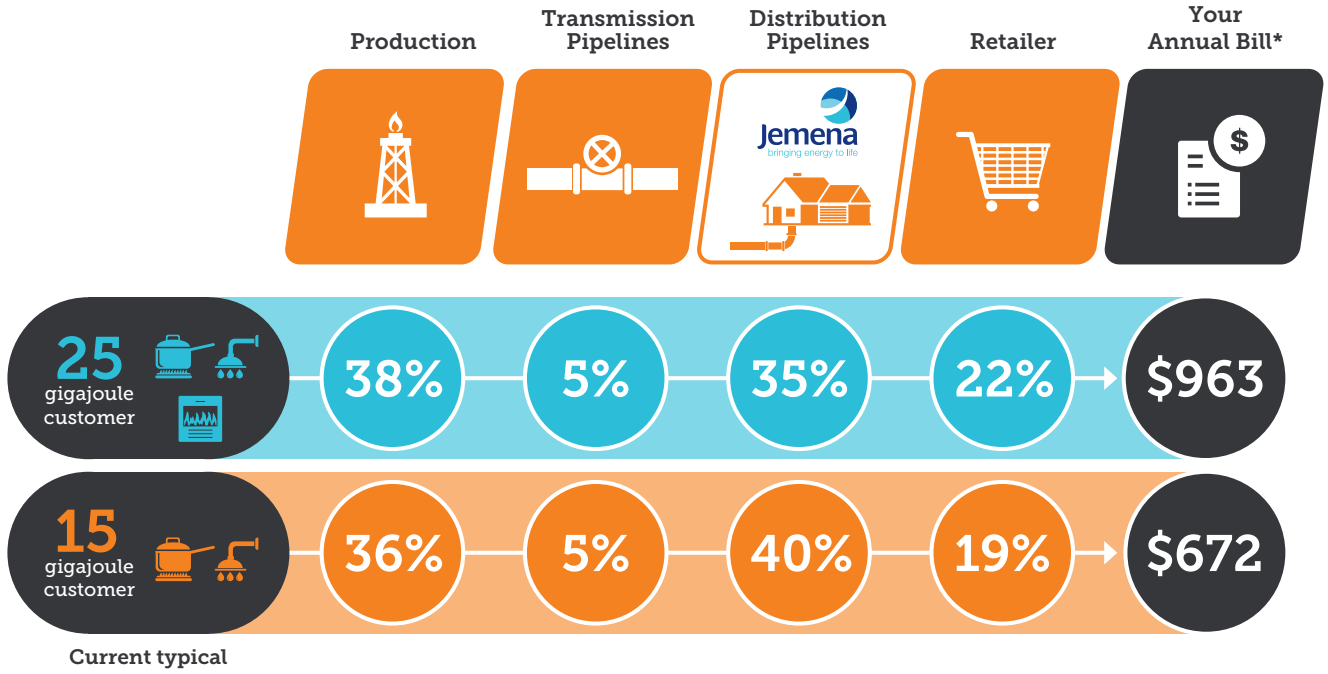


Figure 1.2 What makes up customers' bills



* Annual bill is for 2018-19 year

In addition to transporting gas through our network, we also undertake a range of other activities for our customers (see Figure 1.3).

Figure 1.3 What we do for our customers

Our customers

We group our customers into three high-level categories—residential, commercial and industrial. We also separate our customers into market types, based on their energy usage. Our volume market consists of customers consuming less than 10 terajoules (TJ) of gas each year. The demand market is comprised of customers consuming greater than 10TJ of gas each year.

Table 1.1 Our customers

Market type		JGN market Size	Consumption
Volume customers (<10 terajoules per annum)	**Residential:** Non-business home-owners or tenants who use natural gas for applications such as heating, hot water and cooking.	97% (1.37M)	30% (26.1 petajoules)
	Commercial: Small business and commercial owners. These customers predominantly use gas for commercial space heating (offices, shopping centres) and commercial cooking (restaurants and bakeries).	2.6% (36.5k)	15% (13.3 petajoules)
Demand customers (>10 terajoules per annum)	**Industrial:** The JGN industrial market comprises of chemical production, manufacturing or electricity generation.	0.03% (400)	55% (47.9 petajoules)

1.2 Regulatory framework

Like most energy distribution network businesses in Australia, our energy prices are regulated.

That means every five years we submit proposed revisions to our Access Arrangement—which outlines our plans, the amount we expect to spend implementing them, our revenue requirements and our pricing—to the AER for approval. We operate under the National Gas Law, which requires that our plan promotes the long-term interests of consumers.

As part of its assessment of these revisions, the AER will consider—among other factors—the extent and quality of customer engagement we have undertaken during its development. It also looks for evidence that what we are proposing reflects the outcomes of that engagement process, and that our approach complies with the requirements set out in the National Gas Law and the National Gas Rules. This includes reviewing our proposed revenue to ensure that it represents the efficient costs that we are likely to incur in providing our network services.

The AER will then either approve our Access Arrangement revisions, or specify the changes we must make. Once approved, we must set our prices in line with this document.

1.3 What is our 2020 plan?

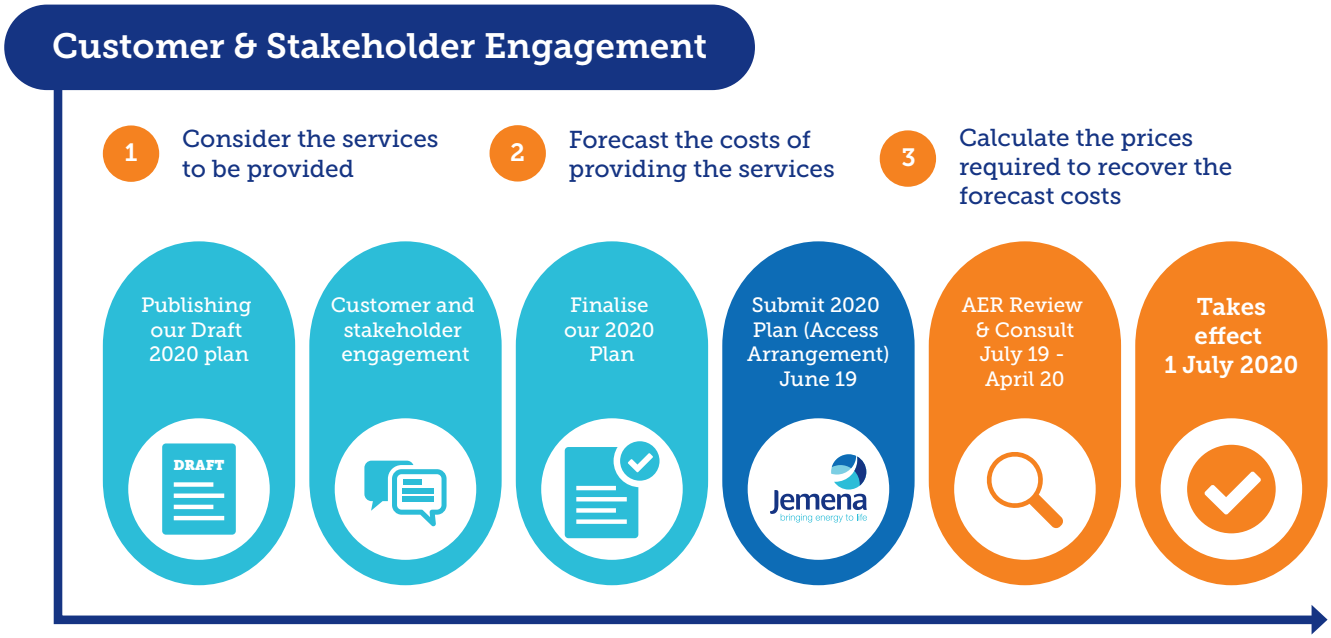
Our 2020 Plan for the five-year period from 1 July 2020 to 30 June 2025, including its associated attachments, constitutes our submission to the AER.

It sets out:

- how we engaged with our customers to understand their views on what our priorities should be, and the service levels they expect us to deliver over the next regulatory period
- the changes we expect to occur in the energy market, and our strategic response to ensure the sustainability of our gas network into the future
- the services that we provide and how the costs we incur in delivering them are efficient
- how we calculate the prices we propose to charge in order to recover these costs.

In developing our 2020 Plan we undertook an extensive customer and stakeholder engagement program to ensure alignment between the initiatives we are proposing and the needs of our customers.

Figure 1.4 Overview of the 2020 Plan development process



Customers assumed the role of 'Jemena engineer'

1.4 Feedback on our Draft 2020 Plan

In January 2019 we published a draft of our 2020 Plan for consultation. We did this to ensure that the decisions we make about our services, costs and prices accurately reflect our customers' priorities and long-term interests.

Having published our Draft 2020 Plan we re-engaged with a group of our customers from across NSW to understand whether they felt we had accurately captured their feedback and incorporated their preferences into our plans. More details on this engagement are included within Chapter 2.

We also held a 'deep dive' on some specific topics in our Draft 2020 Plan with representatives from our Customer Council, the AER and its Consumer Challenge Panel. The purpose of the 'deep dive' was to provide attendees with an opportunity to ask questions, and seek more detail, on our Draft 2020 Plan.

The feedback that we received from our customers and interested stakeholders throughout our engagement program, including the specific feedback we received on our Draft 2020 Plan, is discussed throughout our 2020 Plan and its associated attachments.

Energy Consumers Australia (ECA) and the Public Interest Advocacy Centre (PIAC) also provided written submission on our Draft 2020 Plan, which are available at yournetwork.jemena.com.au. In finalising our 2020 Plan we have sought to address the issues and comments raised by ECA and PIAC in their submissions.

1.4 More background information on our 2020 Plan

More detailed information on the background to our 2020 Plan is contained within Attachments 1.1 to 1.4.

Attachment 1.1 contains a document map which sets out all of the documents making up our 2020 Plan.

Jemena staff explain the supply chain

02

What our **customers** have told us

Our customer engagement journey

Dubbo

- Average income: $1,096/week
- Average bill: $576
- Jemena NG arrived: 1997

SEP 17

Customer Council Meetings – Sydney
Understand and shape the engagement

NOV 17

Large customers – Sydney
Customer Forum

Household segments – Wollongong
Low-income study circles

Household – Dubbo, Sydney
Deliberative forums

MAR 18

Customer Council Meetings – Sydney
Test engagement plans

Retailer workshops– Melbourne

Griffith

- Average income: $1,065/week
- Average bill: $750
- Jemena NG arrived: 1993

Bathurst

- Average income: $1,029/week
- Average bill: $1033
- Jemena NG arrived: 1986

Goulbur

- Average income:
- Average bill: $959
- Jemena NG arrive

MAY – SEP 18

Household – Goulburn, Newcastle, Griffith, Bathurst, Western Sydney
Deliberative forums

SEP 18

Household segments – Sydney
Culturally and linguistically diverse focus groups

OCT 18

Customer Council Meetings – Sydney
Engagement results

NOV 18

Large customers – Sydney
Customer forum

NG = natural gas

Customer Engagement in Numbers

4,900 visitors to JGN **website** yournetwork.jemena.com.au

63 Jemena **facilitators**

169 **Hours** of engagement

333 JGN **customers** engaged

293 Online **surveys** completed

8 **Locations** across NSW

43 Engagement **sessions** held

4 **Board members** who attended

Newcastle

Average income: $1,165/week

Average bill: $405

Jemena NG arrived: 1984

APR 18

Customer Council Meetings – Sydney
Network Tour

Large customers – Sydney
Data workshops

MAY 18

Household segments – Sydney
Urban small and medium business forum

JUN 18

Customer Council Meetings – Sydney
Testing price and service options

Household segments – Sydney
Elderly customers study circles

Small and medium enterprise – Sydney
Culturally and linguistically diverse interviews

AUG 18

Small and medium enterprise – Sydney, Griffith
Urban/regional small and medium business forum

Household segments – Sydney
Elderly forum

Sydney

Average income: Varied

Average bill: $520

Jemena NG arrived: 1976

n

$981/week

ed: 1980

MAR 19

Combined Residential Forum, Sydney
Reconvened for feedback on Draft 2020 Plan

CALD Session, Sydney
Updated engagement results

MAY 19

Customer Council Meeting, Sydney
Updated engagement results

FEB 19

Large customers, Webinar
Draft 2020 Plan explained

Wollongong

2.1 Our customer and stakeholder engagement journey

While we continuously work with customers to understand their changing needs, our 2020 Plan development has presented a unique opportunity to work with them to help shape the gas services that we provide over the short and long term.

Every customer has different needs. Through extensive customer segmentation research we conducted as a business-as-usual exercise, we sought to understand the varying needs and preferences of our broad customer base. We shaped our engagement to recognise this diversity: from inner city apartment dwellers who use gas to cook their food to households in cooler climates who use gas to keep warm. We have also sought to better understand our business customers. Natural Gas plays a significant role in the operations of many of our business customers, from shops and offices all the way through to large industrials.

Reflecting this diversity in our engagement was critical to the authenticity of our customer engagement program and in ensuring the results were truly representative and therefore implementable.

With unprecedented change in the gas and wider energy industries expected in the foreseeable future, it is crucial that customers are able to influence the decisions taken today, to ensure the gas network continues to remain relevant and meet their needs.

In preparing our 2020 Plan, we have engaged with a wide range of customers. We created a website yournetwork.jemena.com.au, and promoted it via social media with the aim of seeking inputs from as many customers as possible. Through this, we have shared the opportunity to engage with 4,900 customers, 293 of whom actively shared their views with us.

Figure 2.1 shows the customer groups that we identified for face to face consultations. As it was not possible to speak to all of our 1.4 million customers, we sought to hear from customers that represented the different ways that gas is used and experienced across NSW.

As well as directly seeking the views of customers, we also sought the views of gas retailers and stakeholders such as customer advocates.

Staff and customers discuss options

Figure 2.1 Customer groups identified for face to face consultation

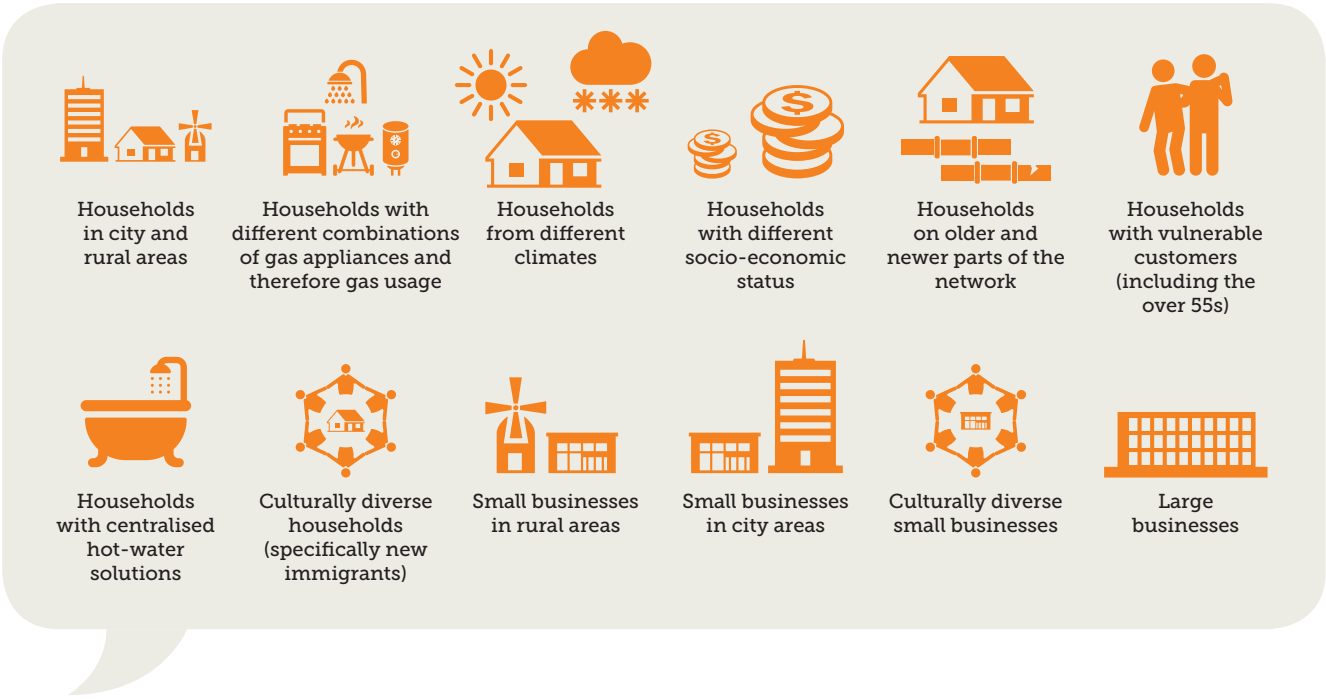
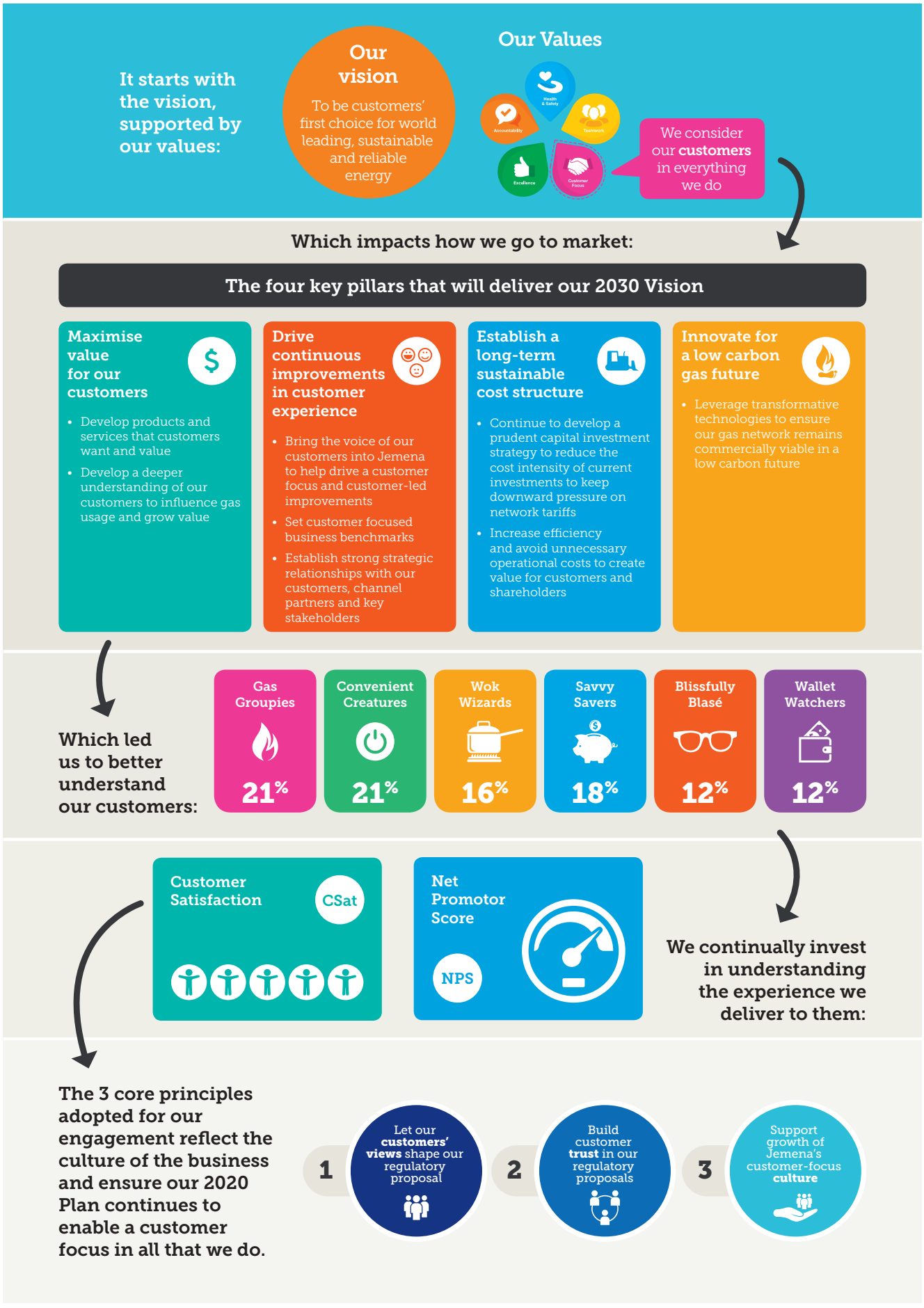


Figure 2.2 illustrates how our customer engagement is rooted in the way we focus on customers on a daily basis. Jemena's vision is "To be customers' first choice for world leading, sustainable, and reliable energy." To drive this through the organisation, one of our five values is Customer Focus. Through the 2030 vision and gas market strategy (see Section 3), we sought to understand customers' preferences and usage via segmentation research. We also seek to continually capture their views on our service, for example through customer satisfaction surveys. Therefore the three core principles that we adopted for our 2020 Plan reflect the culture our business and the focus on customers in everything that we do.

A Bathurst customer considering the alternatives

Figure 2.2 Our customer story



Our engagement strategy

In designing the engagement program for our 2020 Plan we identified three key objectives.

Figure 2.3 Key engagement objectives

1 To achieve our first objective and allow customers to shape our 2020 Plan in a meaningful way, we recognised that we would need to do more than simply *consult*. We have sought to *involve* and, where possible, *collaborate* with our customers, providing them with a greater opportunity to influence our proposal and shape it to meet their long term interests.

2 To ensure our engagement process leads to a 2020 Plan that our customers support, we endeavoured to ensure that the information we presented to them was as unbiased as possible. In other words, customers have heard the full range of opinions on the subjects and issues we discussed with them, and they have had all the information available to allow them to make informed decisions—for example, we showed them the collective and individual bill impacts of different scenarios, in the short and longer term, in a format that was easy to comprehend. We also prioritised discussions where collaboration was possible.

3 Finally, members of the Jemena team from disciplines as diverse as customer service and engineering, from support staff to Board members and our Executive Leadership team (including our Managing Director and Chairman of the Board), participated in our engagement process. This allowed us to share the outcomes and views from customers more broadly throughout our organisation, and for our staff to feel a sense of ownership of the outcomes, which will mean they are better able to apply them in their day-to-day work. This has complemented our ongoing customer research programs—such as segmentation, customer satisfaction and customer experience / voice of the customer.

Members of the Jemena Leadership Team participated in forums

2.2 How we engaged

We started our engagement program for our 2020 Plan back in 2017, working with a range of customers to understand their responses to two key questions:

- What topics or issues are important to customers?
- How do the different types of customers and communities want to engage?

The answers to those questions helped us to construct an engagement plan that reflected the needs and interests of our customer base.

Residential customers

To enable us to tailor our engagement we split residential customers into three main groups: (a) general households, (b) those with low income and/or over the age of 55, (c) and those from culturally and linguistically diverse backgrounds. We tailored the engagement approach for each of these groups to help make the process as suitable and successful as possible.

For general households, we recruited groups of 13-25 customers in five cities across NSW. These cities (Bathurst, Goulburn, Griffith, Newcastle and Western Sydney) were specifically chosen to ensure we captured a range of different gas usage and bill profiles, incomes, and climate factors that represented the diversity of our customers and their experiences with gas.

Once the cities were selected, we then randomly recruited customers who represented the range of demographics within each community. Each group met three times, spending over 20 hours together in three full-day sessions. At each location, the same structure was followed:

- **Forum 1** – Introduction and orientation to the gas industry and Jemena, understanding initial customer preferences and exploring differences.
- **Forum 2** – Exploring issues that affect the gas network such as net-zero carbon policies, the costs of maintaining or growing the gas network, and understanding different perspectives of those in the room and other external parties.
- **Forum 3** – Exploring different options and the impacts—in terms of service and bills—in the short and long term, and deliberating on the best outcomes for their communities.

The insights and feedback from our customers at these forums informed the development of our 2020 Plan.

After we published the Draft 2020 Plan in January 2019, we re-convened a representative group of 32 customers from the same five cities across NSW (from a pool of 69 who expressed their interest to take part). The aim of the final session was to understand whether or not we had incorporated customers' feedback correctly, to seek their views on the Draft 2020 Plan as a whole, and to further refine our understanding of their preferences and how we applied them for different investment decisions. Specifically we wanted our customers to answer the question 'Is Jemena's 2020 Plan in customers' long-term interests?'.

- **Forum 4** – Overview of key elements of Draft 2020 Plan to understand whether we had correctly understood and applied feedback from our customers. Additional customers views on some of our capital projects, customer voting on where the 2020 Plan is in their long-term interests.

For the low income/over-55 group of customers, we held shorter sessions but kept to the principle of deliberation. We held two in Western Sydney following the same basic structure as Forums 1 and 2 above, but selected topics and activities that were of interest to this group and were less complex and therefore suitable for the shorter time frame.

Through this process, we identified that a section of the over-55 community were not represented in the forums. They were customers who lived in retirement villages, and specifically those with centralised hot water systems. We therefore held a third group at a retirement village in Kirrawee—with residents from two similar retirement complexes—to understand their experiences of using gas.

Our final group was representative of the CALD—culturally and linguistically diverse—community. We decided to explicitly target migrant communities who had been in Australia for between three and six years, to understand their journey and their unique perspectives on gas.

We worked with the Ethnic Communities Council (ECC) to identify an Arabic community in Fairfield and to facilitate three forums in that language.

Again, we utilised the structure from Forums 1 and 2, which we adapted to cater for the needs of the customers. We met with them again after the Draft 2020 Plan was published to ensure we had correctly captured their views, and to understand their perspective on the key question of whether or not the 2020 Plan is in their long term interests.

Our 2020 Plan engagement program has complemented our business-as-usual market and customer service research into the needs and preferences of customers. This includes monitoring customer satisfaction at key moments in the customers lifecycle, such as the new connections process or interacting with the Jemena call centre. Important themes for customers—such as increased communication, keeping gas affordable and visibility of the different players in the energy market and their roles in the process—have been common from across both our ongoing research and the 2020 Plan engagement.

Small business customers

We identified three groups of small business customers: those in rural areas; those in the city; and those from CALD backgrounds. Their usage patterns varied considerably. Some had very seasonal usage, particularly retail businesses that used gas for store heating, while others who used gas for cooking, or as part of their production processes had a much steadier gas-usage profile.

A facilitator from the ECC at one of the CALD forums

Because these customers were time poor, taking the same deliberative approach that we used with residential customers was not possible. We therefore began by conducting a focus group with small businesses in Sydney, but this meant they were not able to ask questions and seek additional facts and opinions to inform their discussions.

As a result, we changed the format for the rural customer group—which we met in Griffith—into a forum where Jemena staff were present and able to engage in a consultative way. This format was easier to recruit for and more successful than the session we held in Sydney.

For the third session, we engaged once more with the ECC and conducted interviews with a range of small-business owners in the restaurant and hospitality field. In total, we conducted 23 interviews in a mix of Arabic, Hindi, Cantonese and Mandarin.

Large customers

At our annual large customer forum in 2017, customers told us that they wanted us to engage with them during the development of our 2020 Plan, to ensure there were no surprises. As they were time poor, they stated a preference for one-on-one discussions, and for these to take place during regular business-as-usual meetings with Jemena, and at the next large-customer forum.

As we went through the process of developing our Draft 2020 Plan, we engaged with large users about their likely future demand requirements, our plans to allow them to reset their Chargeable Demand (CD)—most of our large business customers are charged based on the level of capacity they require—and our tariffs.

At our 2018 annual large customer forum we sought customers' views on balancing price, reliability and the environment, short term versus long term trade-offs, their thoughts on the impact of a low carbon future and how they prefer our price to change from year to year to provide our total 5-year revenue allowance (their preferred "price path").

In February 2019, shortly after publishing our Draft 2020 Plan we held a webinar with our self-contracting large users, to provide the opportunity for them to ask questions about the detail of the our plans and to share further information on proposed revisions to our Access Arrangement.

Our Customer Council

Our Customer Council has been in place since October 2013. Building strong working relationships with industry stakeholders, key customers and customer advocates through our Customer Council, ensures we have an ongoing source of the voice of customer. The members of our Customer Council are shown in Figure 2.4.

As we developed our 2020 Plan, we met with the Customer Council at each phase of our engagement program to seek their input and advice on both the structure and the content of our engagement program.

We also held individual and small group meetings with Customer Council members to hear their views and seek expert advice on specific topics related to our 2020 Plan. We also briefed the Customer Council ahead of publishing our Draft 2020 Plan in January 2019, and invited them to attend a deep dive on our Draft 2020 Plan in February 2019.

To ensure transparency we invited customers who had participated in our forums to attend a Customer Council meeting. This was a successful initiative, leading to the ongoing inclusion of additional end-use customers (both residential and industrial) to the Customer Council.

Figure 2.4 Our Customer Council members

- Public Interest Advocacy Centre (PIAC)
- Ethnic Communities Council NSW (ECCNSW)
- Energy Consumers Australia (ECA)
- Salvation Army
- St Vincent de Paul
- Council on the Ageing NSW (COTA)

- NSW Business Chamber (NSWBC)

- Energy Users Association of Australia (EUAA)
- CSR Ltd
- Brickworks
- Orica
- BlueScope

- Alinta

- Urban Development Institute of Australia (UDIA)
- Energy & Water Ombudsman - NSW (EWON)

Arabic speaking staff lend a hand

2.3 Engagement outcomes

Residential customers

Throughout our engagement sessions, it was clear that our customers enjoyed the benefits of natural gas and, in line with our ongoing market research, they confirmed that once they had experienced using it they had a preference for it. Overall, they believed natural gas gave them value for money, and often described it as being 'affordable', but they—specifically those customers on lower incomes—were concerned about increasing costs. The message we heard loud and clear from our customers was their desire for Jemena to ensure gas remains affordable.

Our customers told us that they want to continue to use natural gas in the future, but they were conscious of the environment. They recognised that natural gas was a more environmentally friendly choice at the moment than mains electricity, but they could also foresee significant changes in the energy market and were generally expectant that the industry would deliver a zero-carbon solution in the longer term.

Four key themes emerged in our discussions and we have used them to shape our 2020 Plan. These themes are: affordability, a safe and reliable gas service, fairness, and innovating and planning for the future.

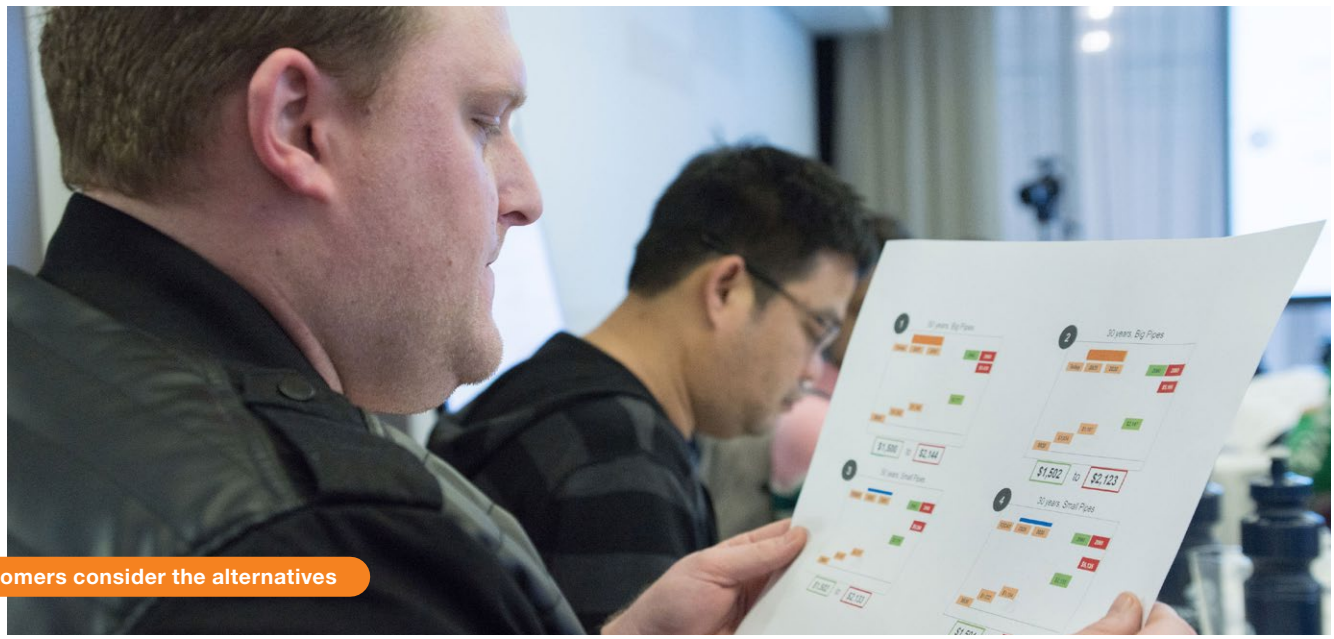
We saw these themes emerge in the prioritisation exercises we conducted in our first forums. As part of discussing our Draft 2020 Plan in Forum 4 with our residential customers, we tested these themes further to assess how well we had addressed customer feedback.

At the beginning of the forums, we asked customers what their priorities were for their gas service. Affordability was the key issue, and therefore every decision we then discussed was done so in the light of any short or long-term bill impacts. This highlighted an important dynamic. For example, when price was traded off against reliability, customers were generally not prepared to compromise current service standards. Similarly, our customers told us that they were satisfied with current service standards and would not want to pay for these to be increased. They did however want us to keep investing in the future of the network, irrespective of whether we are investing to prepare for a low carbon future, or to ensure the gas network is available, with the same service levels as provided today, for future customers.

As the final part of our engagement process we asked customers two key questions:

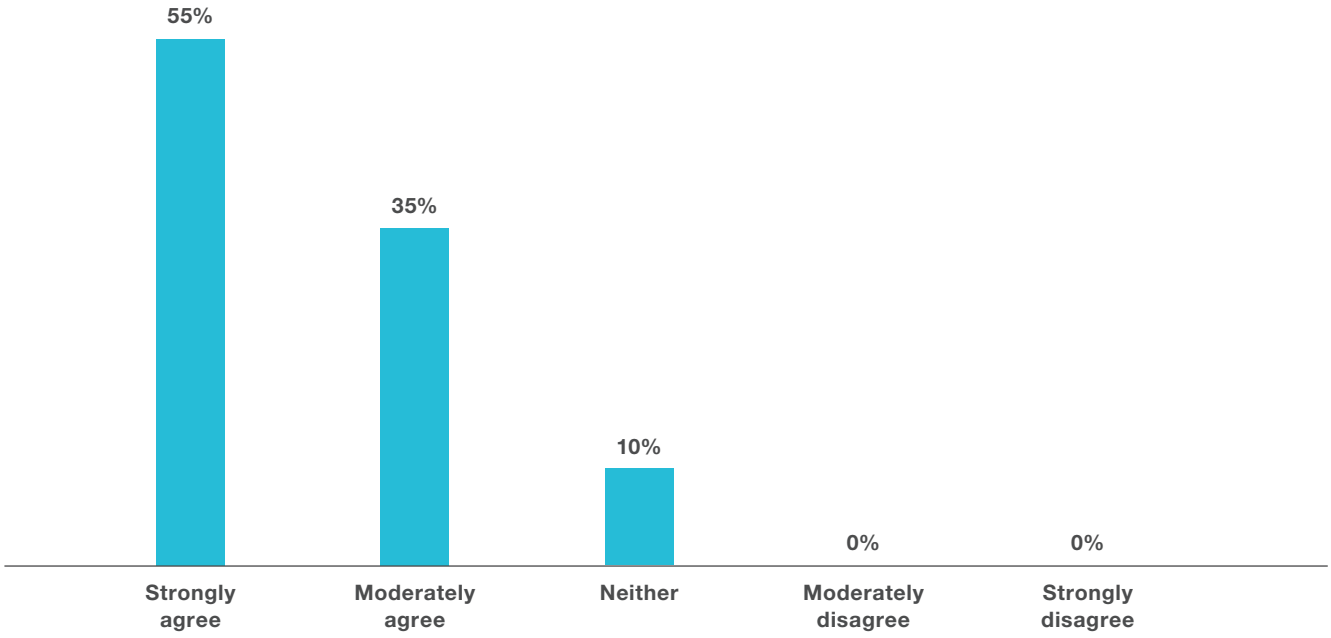
- did they feel we had accurately reflected their feedback in our plan?
- did they think Jemena's approach for 2020-2025 is in their long term interests?

The answer to both questions was an overwhelming yes (see Figures 2.5 and 2.6)—through our in-depth and consultative process we are incredibly humbled to report on behalf of our customers that we have delivered a plan that, despite the varying needs of our customers, finds a fair balance and is in their long-term interests.



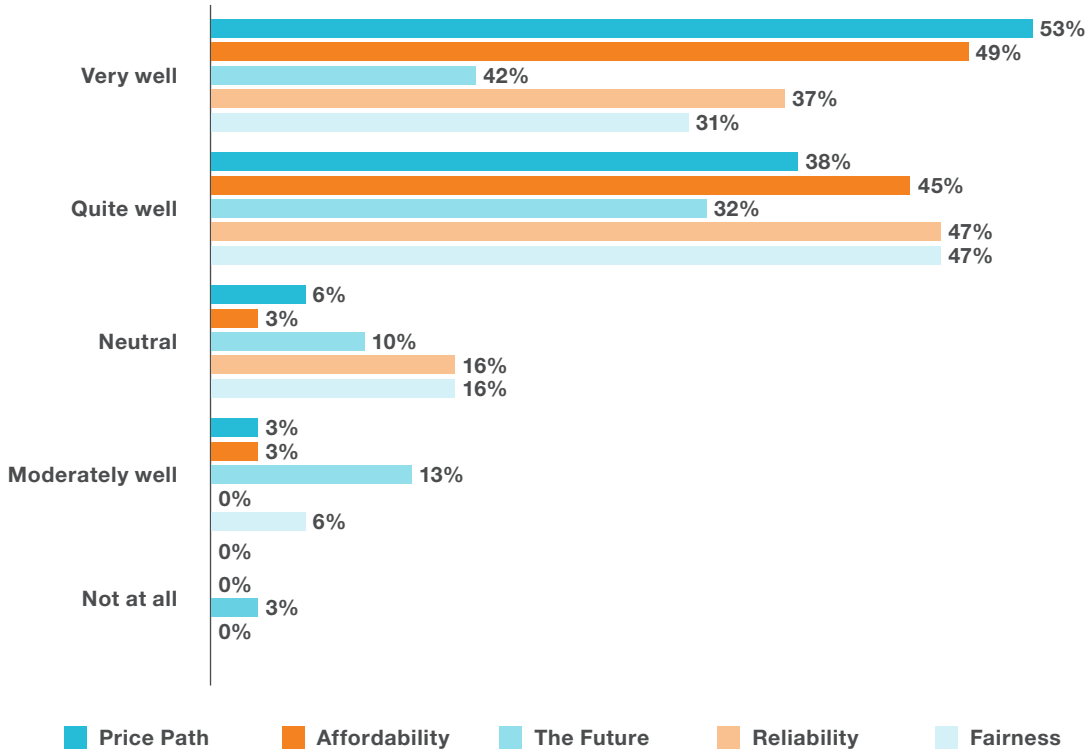
Customers consider the alternatives

Figure 2.5 Voting results: To what extent do you agree that the Jemena Gas Networks' Draft 2020 Plan is in the long-term interest of customers? (N=31)



Source – Draft 2020 Plan Consultation Report, RPS 2019 (provided in Attachment 2.2)

Figure 2.6 Voting results on a scale of 1 to 5, how well do you think Jemena responded to customer feedback on the key themes and price path



Source – Draft 2020 Plan Consultation Report, RPS 2019 (provided in Attachment 2.2)

Table 2.1 What our residential customers told us

Topic we engaged on	What customers said	How we are responding
What are customers' key priorities and service preferences	– Keep gas affordable – Maintain the current service standards	– As shown in Figure X.2, we have delivered a number of network bill reductions for residential customers since 2014-15 (excluding the impact of inflation). Network bills will drop again in 2021 and by 2025, a typical customer's network bill will be lower again – Improving cost competitiveness – Reducing revenue requirement on a per customer basis – Maintaining current service levels
What are customers' expectations and priorities for the future	– Work towards a renewable future—but not at any cost – Generally, a positive sentiment towards a transition to hydrogen	– Investing $8M in the Power to Gas trial—we will only seek to recover hydrogen or future fuel innovation costs from customers if the trial is successful and the technology is capable of being utilised within our network – Future Fuels Cooperative Research Centre support – We will not propose an innovation allowance at this time
How should we support vulnerable customers	– Customers would be happy to pay an additional $1 per annum to fund increased support for vulnerable customers – Jemena however was not seen as the appropriate channel for this – Customers find the gas bill confusing and complex	– We are not proceeding with providing vulnerable customer support in our 2020 Plan – Lowering prices is the best outcome – Advocating for retailers to pass on network price reductions – Advocating for retail bills in other languages – Signing up to the Energy Charter (refer to page 23) to advocate for vulnerable customers across the industry

Investing for the future was the one areas where customers did not think our 2020 Plan went far enough.

We are committed to investigating and planning for the future, but we are also mindful that other stakeholder groups are less positive about the role of gas in the future, a view expressed by PIAC in its submission on our Draft 2020 Plan. While we won't propose an innovation allowance or scheme at this time it is something that we are committed to pursuing in the next review. We are also pursuing alternatives fuels outside of the 2020 Plan, and are conscious of our customers strong preferences in this area.

Topic we engaged on	What customers said	How we are responding
Whether to change the profile of cost recovery of future investments to strike a fair balance between current and future customers	– Customers want us to take a proactive approach to managing future uncertainty and to minimise any negative customer consequences, such as future bill increases – Changing the recovery period for new, medium pressure mains and services assets was seen as a low risk or 'no regrets' approach	– We have incorporated customer preferences on the profile of cost recovery into our 2020 Plan. We tested the 2020 Plan as a whole with customers, enabling them to see the impact of cost recovery changes in the context of the overall plan and they confirmed their support for this change at our March 2019 forums – We are proposing to expense corporate overheads which will reduce capital expenditure in the long term and help improve the cost-competitiveness of gas over the long term
Changes to our investment strategy	– Customers expect the gas network to be ready for the future. They want us to continue to invest with a positive outlook for the future of gas	– We have taken this feedback into account and balanced it against other feedback provided – Following the publication of our Draft 2020 Plan we received customer endorsement of our investment strategy. More details are provided in Chapter 5 and Attachment 5.1
What are customer preferences on how they would like to receive any price decreases across 2020-25	– Residential customers have a clear preference for a smooth retail bill, and expressed the importance of stability in managing budgets – Customers expressed concern that efforts were made to ensure any savings were passed on to them	– Our proposed price path is designed to mitigate movements in the forecast wholesale gas price – We will advocate for retailers to pass on network price reductions
Connection charge for all-electric homes connecting to gas	– Customers thought a customer contribution to the cost of a new connection was fair in principal – Customers were concerned about the price charged and the impact that would have on new connection volumes and hence the gas price	– Analysis showed the benefit of the upfront contribution was outweighed by the reduction in forecast connection volumes – We are not proceeding given that further analysis showed that this could increase bills for existing customers
Estimated meter readings	– Customers were concerned about the impact of estimated meter readings on budgeting and feel estimates are generally unfair – They expect Jemena to continue to investigate and manage estimations including technology solutions as they become affordable	– We are taking action now rather than waiting for 2020 to reduce the number of estimated meter reads. These actions have already driven a step change improvement in meter reading performance – Our proposed capital expenditure sharing scheme (discussed in section 7) will include a service performance measure on our meter reading performance

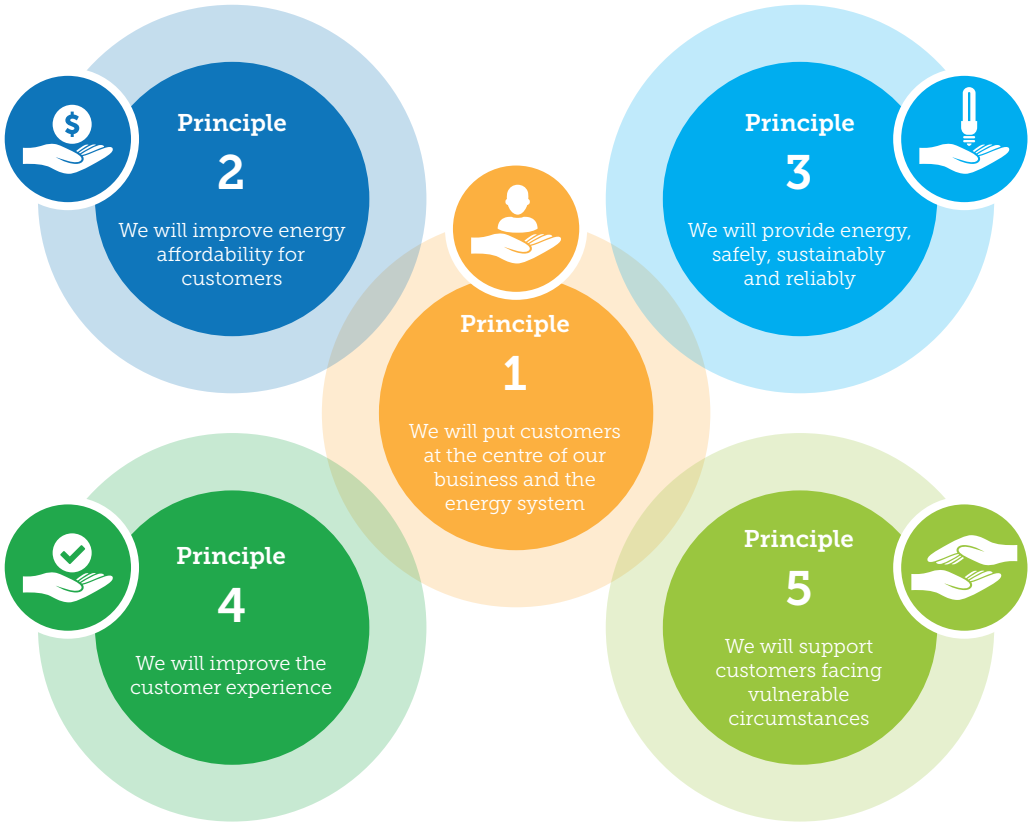
Energy Charter

A first of its kind and a whole-of-industry initiative, the Energy Charter represents a voluntary commitment by numerous Australian energy companies to 'put customers first' by challenging and holding ourselves accountable for being customer focused and transparent in what we do.

"The Energy Charter is an opportunity for our industry to make sure customers are front and centre. We know a lot of homes and businesses are doing it tough and the Charter is an opportunity for us to work on ways to bring down customer bills, provide more clean energy and enhance network reliability."

Frank Tudor, Managing Director, Jemena

Figure 2.7 Energy Charter Principles



We believe that our 2020 Plan is closely aligned to the Energy Charter Principles:

Principle 1 – our 2020 Plan is strongly centred on customer engagement and is supported by our customers.

Principle 2 – our 2020 Plan delivers reductions in network prices.

Principle 3 – our costs are prudent and efficient, and the minimum required to maintain the safely and reliability of our network. Our green gas project starts our journey to sustainability.

Principle 4 – our IT capital program will allow us to keep up with evolving customer expectations in how they interact with us and the information we can provide.

Principle 5 – the proposed price path reflects customers' views to keep retail prices stable, which is important for vulnerable customers.

Small business customers

All of the small business customers that we engaged with were concerned about the affordability of gas. Some had considered alternatives to gas, while others were looking to minimise their usage, but that wasn't something all businesses felt was an option for them.

Table 2.2 What our small business customers told us

Topic we engaged on	What customers said	How we are responding
Affordability and the impact of changes in the gas price	– Some customers perceive that gas is not the cheap solution it used to be – Some customers would look to minimise gas consumption and find alternatives if prices were to increase significantly – While affordability is the key issue, customers did not want to see service levels decline	– We delivered price decreases over the 2015-20 period and provide a further decrease in this 2020 Plan – We are improving cost competitiveness – We are reducing the amount of revenue we require on a per customer basis – We are maintaining current service levels
Expectations and priorities for the future	– Businesses tended to prioritise their energy efficiency as a way of improving affordability and reducing their environmental impact – Few had considered the impacts of Hydrogen or other fuel types on their business and were uncertain what the implications would be	– Through our investment and involvement in the Future Fuels Cooperative Research Centre, we will help businesses to understand the impact of different fuel mixes and any impacts on their business

Customers sharing views in Parramatta

Large users

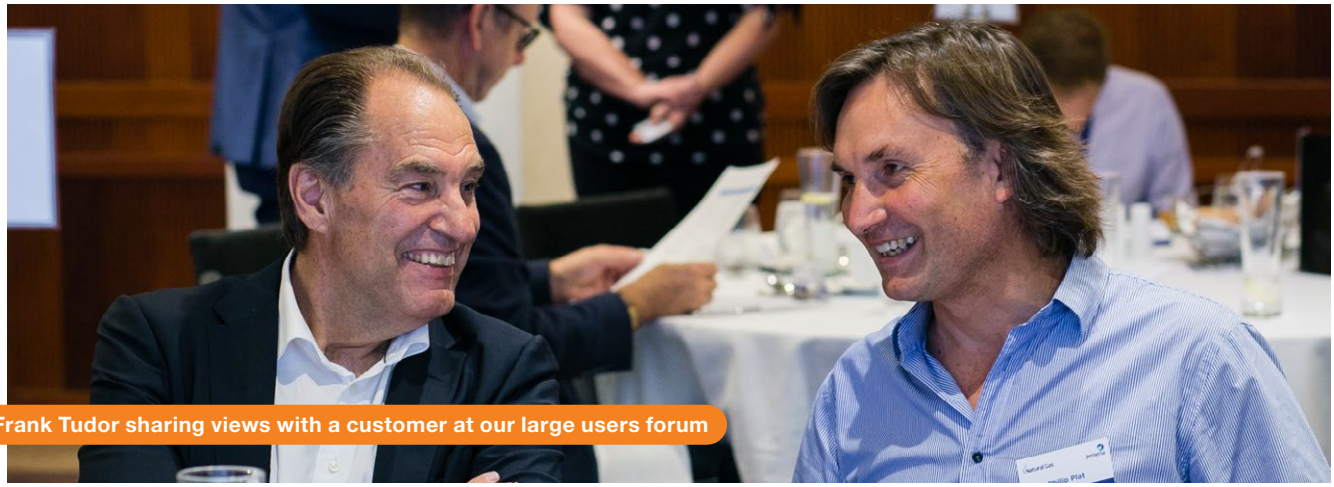
The role of natural gas in the operations of some of our largest customers is such that they are engaged with the gas industry on an ongoing basis, with a few participating regularly as members of our Customer Council. Our engagement program therefore was an extension of the way we manage our existing relationship, in which we sought to understand the impacts of any changes presented by our 2020 Plan, and to listen to any changes proposed by, and feedback received from, those customers.

The key concerns were price, and the way in which these customers negotiate contracts in order to manage their costs. They were also concerned about any changes to service provision. In particular, they wanted access to data that would allow them to improve and manage their energy efficiency.

They told us that the gas price and reliability are priorities for 2020-25, and beyond that, meeting the environmental targets will become important. The net-zero carbon target (or general environmental trends) is something that their businesses are aware of and responding to, and they expect Jemena to play a role in transitioning and preparing for this future. But the overall message was to keep things steady, avoid significant increases in price and price fluctuations.

Table 2.3 What our large users told us

Topic we engaged on	What customers said	How we are responding
Automatic reset of demand capacity	– Affordability is the number one concern	– We have incorporated an automatic reset of demand capacity to occur on 1 July 2020. We are also simplifying the process for customers to request resets after 1 July 2020
What are customer preferences on how they would like to receive any price decreases across 2020-25	– Price fluctuations are challenging to manage – Price pressure in the gas market caused by exports and wholesale gas prices is seen to be an issue for 2020-25 but they expect that beyond this the price will settle	– Prices have been steady in nominal terms since 2015-16 with price reductions proposed in this 2020 Plan – Our proposed price path will enable us to best meet customer preferences
Daily meter data service for large users	– Some large customers said that they would value access to the daily data Jemena is required to send to the market so that they have better visibility of their efficiency and can better manage costs	– We have recently launched our gas customer insights product that delivers usage information as a daily read email to assist key decision makers to understand and optimise their gas usage



MD Frank Tudor sharing views with a customer at our large users forum

Developers and other stakeholders

In addition to our core customer groups, we also consulted with a range of developers that we work with on a day-to-day basis, to hear their views on specific topics we have been investigating, like boundary metering.

We also engaged with NSW Government agencies, embedded network providers, the Housing Industry Association and the Master Plumbers Association (see section 4.3 for details). In addition, we engaged with retailers, holding a retailer forum and conducting interviews to seek their input and feedback.

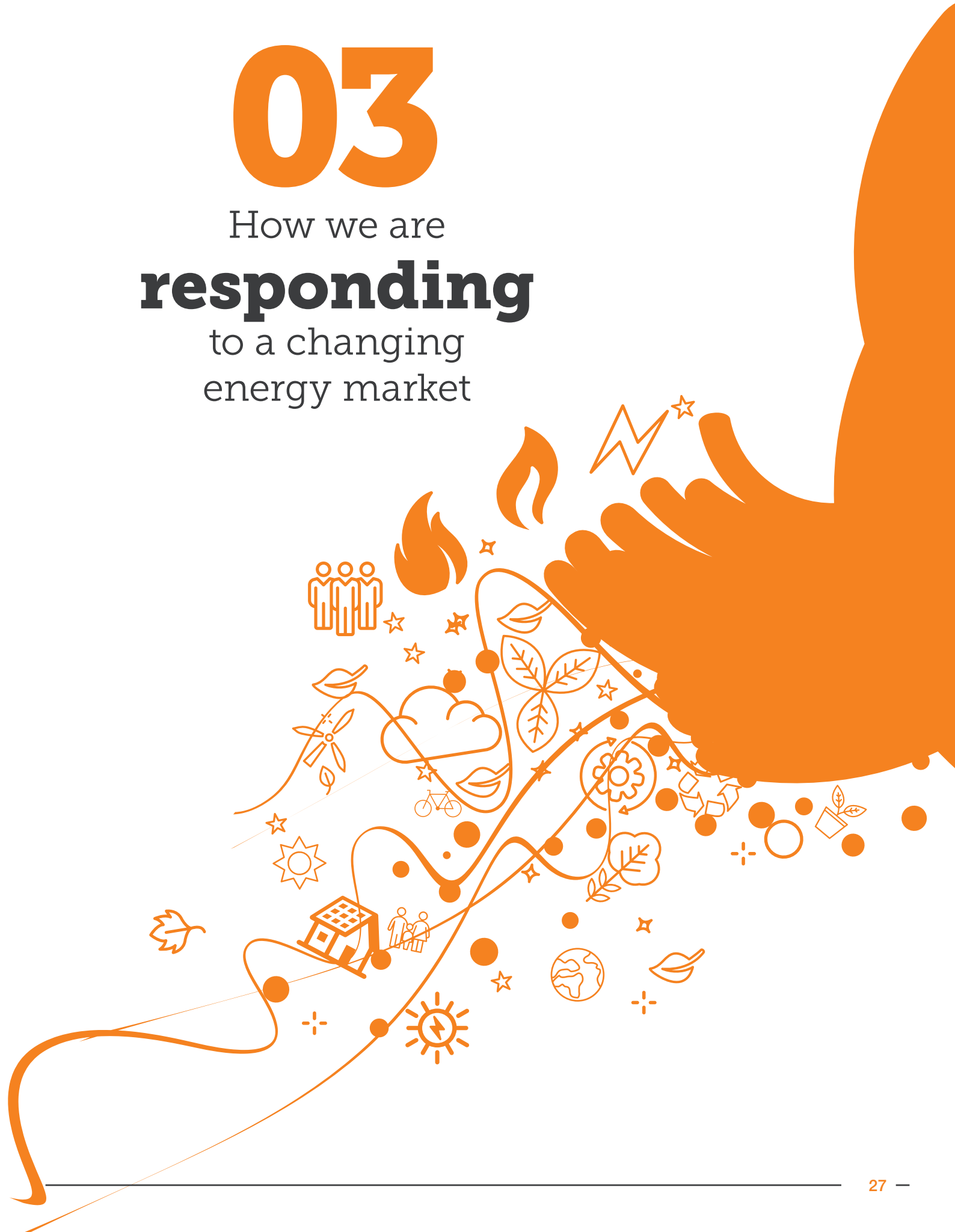
Staff and customers enjoyed and valued engaging

2.4 More information on our customer engagement program

More detailed information on our customer and stakeholder engagement program is contained within Attachments 2.1 to 2.4.

03

How we are **responding** to a changing energy market



3.1 The energy market is undergoing unprecedented change

We are developing this 2020 Plan during a period of unprecedented change in the Australian energy market. Many of these changes have important implications for our customers, and for our business, both in the short and longer term.

In recent years, we have seen significant growth of the Queensland Liquified Natural Gas (LNG) export market. In addition, onshore gas development bans and restrictions are currently in place in Victoria and NSW respectively. Together, these have put upward pressure on east-coast gas supplies and resulted in a step-change in domestic wholesale gas prices.

These factors, amongst others, have contributed to a reduction in the affordability of energy, which in turn has become a key issue for our customers, politicians and policy makers.

We know from our discussions with customers—of all types—that they do not believe the energy market is working with their long-term interests in mind. They expect energy companies to be more transparent and inclusive about their plans.

In response, as we developed our 2020 Plan, we opened up to public consultation the strategies that underpin our future plans for the NSW gas network. This approach is consistent with our new Energy Charter commitments for greater transparency and putting our customers at the centre of business decision-making. Opening up our plans for consultation has been an effective way for customers to have their say in our future direction, and we have incorporated their feedback into our 2020 Plan.

The strategies that we sought feedback on from our customers are a key part of our proposed response to the challenges we face as we transition to a low-cost, net-zero carbon energy sector by 2050. Below, we detail a suite of initiatives for the next regulatory period that are aimed at maintaining the competitive position of natural gas into the future. For transparency, in section 3.3 we have also identified the initiatives that we have investigated and chosen not to include in our 2020 Plan. We also explain the reasons why.

Overall, the package of initiatives, if implemented, would result in bill reductions for customers over the period 2020 to 2025. We also note that three initiatives that sit within the inter-generational equity focus area, if considered in isolation, would result in a price increase over the 2020-25 period (see section 3.3 for details).

Importantly, these initiatives contribute to reducing the growth of our asset base, which will help us to keep gas competitive into the future.

Maintaining reliability is important to customers

Table 3.1 Strategic initiatives considered for our 2020 Plan

Strategic imperative	Focus area	Strategic initiatives within our Draft 2020 Plan
Improve cost competitiveness by 2025	Capital expenditure	• Shorter planning horizon to reduce capital expenditure, where appropriate • Reduce capital expenditure through volume boundary metering strategy • Continue to connect new customers to spread our costs over larger customer base
	Operating expenditure	• Deliver transformation program and ongoing productivity improvements
	Shareholder return	• Accept the AER decision for a lower shareholder return
	Tax	• Retain current approach which results in a lower tax burden on customers than other approaches
Zero carbon network by 2050	Hydrogen	• Invest in hydrogen (the Western Sydney Green Gas Trial) and only apply for cost-recovery if successful (speculative capital expenditure)
	Cost-effective innovation	• Limit innovation investment to industry programs, otherwise self-fund additional innovation
Balanced customer outcomes now and into the future	Inter-generational equity	• Change asset lives for new investment to ensure fair recovery of costs from customers • Reducing growth in our asset base to help ensure long term price competitiveness of gas
	Pricing and service levels	• Providing common minimum levels of service to all customers across NSW • Retain current approach to country/city pricing, so only customers benefiting from the Sydney trunk main pay for it • Large customers on Chargeable Demand (CD) offered the opportunity to reset CD at the start of the 2020 Plan period

Customers in Fairfield enjoy debating options

3.2 New challenges facing gas in NSW

Cost of living pressures exacerbated by higher gas bills

Our customers have told us that they are feeling the negative impacts of higher gas prices. Households have voiced concerns that the cost of living is increasing, but wages and social-security payments are not keeping pace. This sentiment is particularly acute in regional areas of our network—and it is in these regions that customers' gas usage is highest, due to winter heating requirements.

Our large customers are particularly exposed to rising wholesale gas prices, and some are telling us that the impact is so severe it is jeopardising the viability of their business.

Carbon emission targets

The move to a decarbonised energy sector is also a major driver of change. In December 2015, 195 countries, including Australia, agreed on the United Nations Paris Agreement on climate change. For the first time in history, both developed and developing countries committed to reducing the amount of carbon dioxide they emit into the atmosphere.

In line with the Paris Agreement, Australia has committed to transition to a low carbon future, and the Federal Government has set a target to reduce carbon emissions by 26-28% on 2005 levels by 2030. Additionally, state governments have set emission targets of their own—including the NSW Government—which has set a net-zero carbon emissions target by 2050.

What is the NSW Government's net-zero carbon emission target?

In 2016, the NSW Government committed to an aspirational objective to achieve net-zero-carbon emissions by 2050. This target is 'intended to provide a clear statement of the government's intent, commitment, and level of ambition and to set expectations about future emissions pathways that will help the private sector and government agencies to plan and act.'[1]

The net-zero carbon emission target forms a key part of the NSW Government's Climate Change policy framework for NSW. In making the commitment to achieve net-zero carbon emissions, the NSW Government noted that it aims to:[2]

- attract investment by providing policy certainty
- guide public and private sector decision making, particularly for long-lived assets
- ensure consistency of NSW Government policy with the international and national policy context and the likely long term direction of government and private sector action on climate change.

1 *Factsheet: Achieving net-zero emissions by 2050*, Office of Environment and Heritage

2 *NSW Climate Change Policy Framework*, State of NSW and Office of Environment and Heritage

These Federal and NSW Government targets, and associated shifts in government policy, are driving major changes within the energy sector. The NSW Government has recently completed its Renewable Energy Action plan (to increase renewable energy generation) and is investing $1.4 billion through its Climate Change Fund to promote energy efficiency and clean energy. Funded programs include discounts for energy efficiency air conditioners and rooftop solar systems for eligible low-income households.

While natural gas has historically been promoted as the low-carbon energy option, these changes mean that the long-term future of natural gas is no longer assured—as it contains carbon.

Although we have recently seen significant growth in customers connecting to our network, driven by the NSW housing boom, it is possible that Government policy changes to meet the net-zero carbon target could make the gas network too expensive to be competitive in the long-term, or make continued operation of the network infeasible.

Uncertainty around the future of our gas network in a zero-carbon future makes planning difficult. This is because we don't know who will be using gas and how they will be using it in 2050. For example, will we continue to supply natural gas as we do now, or might we have made the transition from methane to hydrogen? Or will new customers stop connecting to gas? Will the gas network service a declining base of existing customers?

In our 2020 Plan, we have proposed a number of proactive initiatives which seek to ensure the continued competitiveness of our network in the long term. By acting now we hope to avoid the need for large scale, reactive changes in the future, which are likely to detrimentally impact our customers. These initiatives are outlined in section 3.3.

We expect to have a clearer picture of the future of the gas network in the 2030s. This is when we think we will have a better idea about the feasibility of using hydrogen—a zero emissions alternative—in our network.

The decisions we make today have long-term consequences for our customers and our network. That is why we need to consider the full range of possible future scenarios when charting our path for the future.

Technology and appliance options

While natural gas appliance manufacturers have continued to innovate their products and introduce new features, the range available for residential households has not proliferated to the same extent that electric appliances have. This has contributed to the decline in average residential consumption of about 9% since 2009.

Other reasons for the decline in residential gas consumption at a household level include:

- increased efficiency of gas appliances;
- decrease in average household size as demographics shift and the trend towards high density living increases; and
- the substitution of gas heating and cooking by reverse-cycle air conditioning and induction cooktops.

The gas network continues to modernise

3.3 Our strategic response

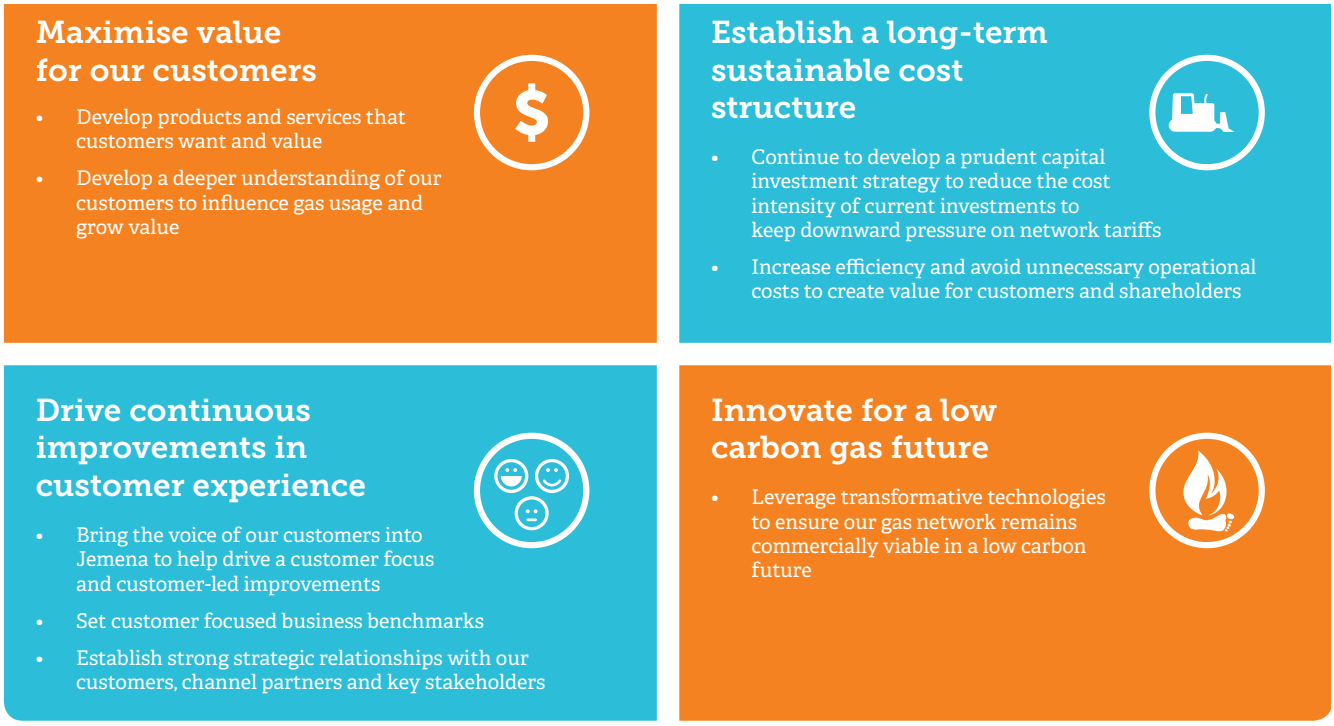
Despite these challenges, our customers have told us that they have a preference for gas in their homes and businesses and that they expect us to proactively respond to the changing energy landscape.

We are responding to these challenges by building a more commercial and competitive business, and delivering fair outcomes across the communities we serve. Key to this is our vision to maximise the sustainability of our gas network by connecting customers to the low-carbon energy future, and our Gas Market Strategy (see Figure 3.1).

We believe that our 2020 Plan will help us work towards achieving our gas markets vision by:

- driving sustainable cost reductions—without compromising safety or reliability—to put downward pressure on bills;
- innovating for a zero-carbon gas future by readying our network to transport low-carbon gas;
- delivering balanced outcomes across household and business customers, current and future generations, and city and regional areas of NSW; and
- connecting 130,000 new customers to our network, and continuing to promote gas as a competitive fuel choice, which will help to lower bills in the future.

Figure 3.1 Jemena's Gas Market strategy



Improve cost-competitiveness of gas

Our 2020 Plan will deliver real reductions in our network prices, which will improve the cost competitiveness of gas. These reductions continue the theme of real gas-network price reductions that we commenced in 2015.

The table below sets out the key initiatives in our 2020 Plan that will enable us to improve the cost-competitiveness of gas over the 2020-25 period, and their impact on customer bills.

Figure 3.2 A typical residential customer bill (2010-11 to 2024-25)

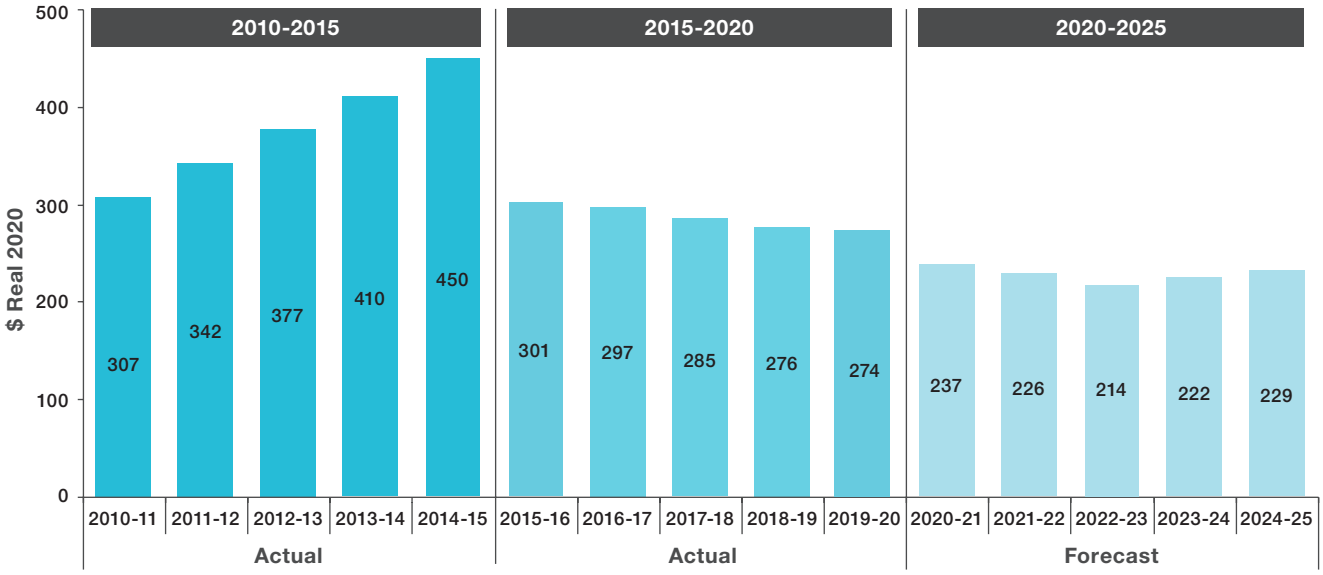


Table 3.2 Strategic initiatives to improve our cost competitiveness

Focus area	Draft 2020 Plan initiative	Impact on customer bills	For further information see
Capital expenditure	Shorter planning horizon to reduce capital expenditure, where appropriate	↓	Section 5.3
	Reducing capital expenditure through volume boundary metering strategy	↓	Sections 4.3 and 5.4
	Continue to connect new customers to spread our costs over a larger customer base	↓	Section 5.4
Operating expenditure	Deliver transformation program and ongoing productivity improvements	↓	Section 6.4
Shareholder return	Accept the AER decision for a lower shareholder return	↓	Section 7.2
Tax	Retain current approach which results in a lower tax burden on customers than other approaches	↓	Section 7.6

Balanced customer outcomes now and into the future

Throughout our engagement program, our customers told us that they expect us to balance outcomes fairly for customers across generations, customer types (household and business) and locations (city and country).

When thinking about how our decisions impact customers over the long-term, as explained earlier, we have had to do this in the context of an uncertain future. This means that in developing our 2020 Plan we have to consider a range of possible future outcomes for our gas network.

We believe that the following initiatives in our 2020 Plan will help us achieve the balanced outcomes that our customers expect.

We believe that our strategic initiatives are important to deliver as a package, to help us carefully balance customer outcomes over the short and long term, to ensure that gas remains a competitive fuel choice.

We acknowledge that, if considered in isolation, three of the inter-generational equity initiatives would increase prices for customers in the short term (but decrease price pressure in the long-term). Further, when all of our strategic initiatives are considered as a whole, they result in overall bill reductions in the 2020-25 period.

Table 3.3 Strategic initiatives to deliver balanced customer outcomes now and into the future

Focus area	Strategic initiatives		Impact on customer bills in 2020-25	For further information see
Inter-generational equity	Change asset lives for new investment to ensure fair recovery of costs from customers		↑	Section 7.3
	Reducing growth in our asset base to help ensure long term price competitiveness of gas:	• expense corporate overheads and pigging costs previously capitalised	↑	Section 6.3
		• accelerate recovery of the depreciation on inline inspection assets	↑	Section 7.3
		• reduce capital expenditure, where appropriate	↓	See Table 3.2
		• introduce a capital expenditure incentive scheme	–	Section 7.5
Pricing and service levels	Providing common minimum levels of service to all customers across NSW		–	Section 5
	Retain current approach to country/city pricing, so only customers benefiting from the Sydney trunk pay for it		–	Section 4.2
	Large customers on Chargeable Demand (CD) offered the opportunity to reset CD at the start of the 2020 Plan Period		↓	Attachment 4.1

Table 3.4 Strategic initiatives to work towards a low carbon future

Focus area	Strategic initiatives	Impact on customer bills	For further information see
Hydrogen	Invest in hydrogen (the Western Sydney Green Gas Trial) and only apply for cost-recovery if successful (speculative capital expenditure)	–	See below
Cost-effective innovation	Limit innovation investment to industry programs, otherwise self-fund additional innovation We will not propose additional funding for Jemena-specific innovation in response to stakeholder feedback	–	–

Zero-carbon network by 2050

A key question is how we fund our expenditure on innovation to support the exploration of zero-carbon gas alternatives.

Customers told us that they value using gas in their homes and businesses, and expect us to ensure they can continue to enjoy the benefits of gas into the future.

Some expressed a willingness to pay extra for us to invest in innovation programs, but we also received feedback that:

- customers are struggling to pay their bills, so any additional investment would need to be carefully balanced against affordability concerns; and
- the AER's Consumer Challenge Panel (CCP) is not supportive of innovation allowances or schemes for individual businesses.

We developed our Draft 2020 Plan in light of this feedback. When we met with our customers in March 2019 to discuss our Draft 2020 Plan, many expressed a strong desire that we take a leading role in exploring new, innovative future technologies and energy alternatives. While we are not proposing an innovation scheme for the 2020-25 period, we remain committed to innovating for the future, as evidenced by our investment in the Western Sydney Green Gas Trial.

Table 3.4 sets out the key initiatives that are aimed at ensuring our network remains commercially viable in a low-carbon future, while also balancing customer concerns around affordability and CCP concerns around innovation allowances.

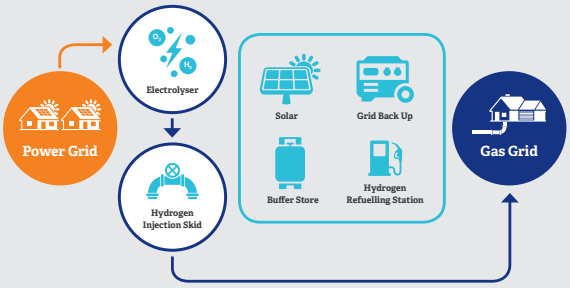
In addition to these key initiatives, as part of our business as usual processes, we are exploring other avenues to reduce the carbon footprint of the gas we deliver to our customers. For example, we are currently developing a renewable gas strategy which will focus on a range of technologies and options, including Biomethane. By taking a holistic view of renewable gas we hope to demonstrate a credible path forward to decarbonise the gas that our customers use.

Western Sydney Green Gas Trial

Our Power to Gas project, the Western Sydney Green Gas Trial, will convert solar and wind power into hydrogen gas, via electrolysis. The hydrogen gas will then be stored for use across our network.

The trial will cost $15M, and is co-funded by Jemena and the Australian Renewable Energy Agency (ARENA). Hydrogen is a zero-carbon fuel, and the purpose of the trial is to demonstrate our network can be used to store excess renewable energy that can be used to support the energy grid and electricity generation that is increasingly intermittent.

We have not included this expenditure in our 2020 Plan. Instead, we intend to treat it as speculative capital expenditure, and will not seek to recover our costs until the technology is proven and plans to roll it out across the network are successful.



Areas of the network continue to grow due to housing demand

Initiatives that we are not proceeding with

Just as customer feedback informed the strategies for our 2020 Plan, there are a number of initiatives that we have decided not to pursue because they aren't aligned with what our customers told us they want.

These include:

- charging more of our customers to connect to our network (see box below for details)
- introducing service contestability for non-meter works on customer property (see box below for details)
- additional support for vulnerable customers—we will not be proposing additional funding for vulnerable customers, as the feedback we received was that other bodies such as the government, retailers and charities are better placed to provide this important support through their existing interfaces to customers.

Investigating whether to change our approach to customer connections

As part of our drive to find ways to reduce our capital expenditure (see section 5.1), we investigated whether customers who would currently connect to our network at no cost should make an upfront contribution. We investigated two potential options:

- Charging for new connections.
- Introducing contestability for certain connection works on a customer's property—meaning a customer could choose, at their cost, any accredited plumber to install the gas service pipe, which may more efficiently meet their overall build timeframes.

We established that both options are technically and legally feasible for, at least, a subset of our connecting customers. We then engaged on various aspects with a number of stakeholders, including developers, builders, our Customer Council, and at our residential deliberative forums. We heard a mixture of views, including some support, but also some circumspection.

We wanted to explore the impact on existing customers.

Asking new customers to make an upfront payment (either to us as a contribution, or to their plumber, to pay for the service pipe) can result in lower ongoing network prices. However, if the upfront payment meant new customers chose not to connect, this might actually make existing customers worse off, because future network charges would be higher than they might have otherwise been with the new customer connected.

To explore this trade-off, we engaged an external firm to survey our existing and potential gas customers about their predisposition to pay to be connected to the gas network. The results indicated that any charge would influence some potential customers not to connect to gas. For example, at a charge of $300, around 23% of potential customers would consider connection too expensive and would choose not to connect.

We analysed, for both options, the significance of capital expenditure savings and how lower connection numbers would impact customers' current and future bills.

The outcome under both options was that customers' long term bills could marginally increase. We have, therefore, not pursued either of these options at this stage.

04

Our plan

reduces

network prices for all customer groups

4.1 What our 2020 Plan means for prices

In all our conversations with customers and stakeholders, it has been clear that affordability is a key priority.

Therefore, when considering our prices—which generate the revenue we require to invest in, and operate our network—for the next regulatory period, we have prioritised providing a sustainable price reduction.

In the previous chapter, we showed how—despite the challenges facing gas in NSW—we have been reducing network prices since 2015. We propose to deliver a further price reduction over the next regulatory period.

In isolation, our 2020 Plan will result in network bill decreases, excluding the impact of inflation, of 11% over the 2020-25 period.

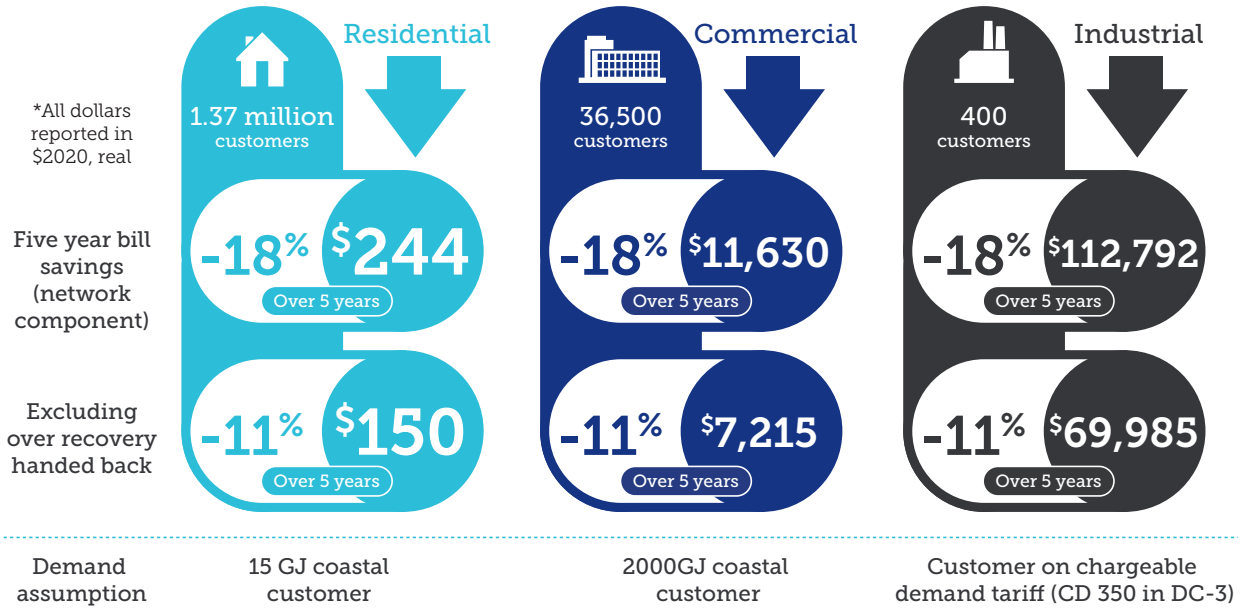
In addition, we will return some revenue we were allowed to recover in the current period (see section 7.7). This will result in a total estimated network bill decrease of 18% over the 2020-25 period, which we propose to deliver with the price path shown in Table 7.1.

This price path is designed to meet our customer preferences for:

- **Affordability**—by delivering an initial network price decrease of 13.28% on 1 July 2020
- **Steady retail bills**—via a price path that we consider most likely to minimise residential customer retail price volatility. In particular, as shown in Figure X.2, we have aimed to strike the right balance between:
  - > minimising the difference between expected network bills for a typical customer in 2021 and 2025 (excluding the impact of inflation), and
  - > the need to dip and return prices between 2022 and 2025—this is an essential feature to enable us to reduce the risk—and size—of a potential price increase in 2026 that could occur if our revenues and costs become misaligned.

Figure 4.1 shows what these price changes would mean for our average residential, commercial and industrial customers.

Figure 4.1 Bill impacts of our 2020 Plan (excluding the impact of inflation)



4.2 Our tariffs and charges

We recover our allowed revenue through our tariffs and charges.

We provide a range of services for which we charge our customers. In Attachment 4.1, we describe the pipeline services that we provide, and specify our reference service. To provide the reference service, we charge customers so that we recover our total revenue requirements for each year, as identified in chapter 7.

The total network charge incorporated into customers' gas bills is made up of one or more of the following components:

- **A fixed charge component**—an annual supply charge that applies to each premises gas is delivered to ($ per annum).
- **A variable charge component**—a usage charge that applies to the volume of gas a customer uses or requires as capacity. We offer declining block usage rates, meaning the price per unit falls the more gas is used. This is to encourage utilisation of our network.
- **Ancillary charges**—fees for certain services or activities—such as special meter reads or disconnections—that apply only when customers have requested or required those services.

Most of our customers pay the fixed and variable charges, but the levels they pay vary to reflect their different characteristics, and the different ways they use gas. Some of our customers may also pay an ancillary charge if they request those services or activities.

The way we set our tariffs and tariff structures is driven by our pricing objectives. These are based on our customers' preferences and to meet the requirements of the National Gas Rules. Our pricing objectives, and what we have heard from customers, are:

- **Provide simplicity and transparency**: Customers told us that retail bills are complex. We want to ensure that customers and stakeholders are able to understand our charges.
- **Provide stability**: Residential customers told us they wanted a price path that smoothed their retail bills, and large customers generally prefer steady network bills. Where possible, we want to minimise any sharp change in all customer's bills and residential customer's retail bills.
- **Keep gas competitive:** Residential customers told us they love using gas around the home, and expect us to secure the future of gas in NSW. We want to maintain and enhance the attractiveness and position of natural gas as a value-for-money fuel of choice in NSW.
- **Drive economic efficiency:** We want to promote efficient use of our network by ensuring customers pay prices that reflect the costs they impose on the network. We also want our charging to be fair—we want similar customers to pay similar prices. Our customers told us that we should consider charging a contribution for connecting people and businesses, where that connection imposed costs on existing customers. Though we investigated a new charge for connections, our research found that it could place upward pressure on prices (refer to section 3.3).
- **Recover our costs**: Customers expect we would only recover our efficient costs, and want us to continue operating with the current level of reliability. We want to ensure we have sufficient funding to provide a safe, reliable and efficient gas network service, now and into the future.

We share more information on our tariffs, assignment criteria and tariff compliance matters in Attachment 4.1.

We charge different prices for different customers to reflect how they use our network

At the broadest level, we differentiate between:

- Volume Market: residential and commercial customers
- Demand Market: large industrial customers

Then we differentiate by location:

- Volume Market: we split customers into two zones, coastal—customers between and including Wollongong to Newcastle—who use the Sydney trunk, or country—all other customers
- Demand Market: we split customers into 12 zones based on postcode

Finally, we differentiate by metering

- Volume Market: whether we bill the customer individually, or use a boundary meter
- Demand Market: based on the size and type of metering they require and use.

4.3 Improving simplicity – boundary metering for new high-rise buildings

What is boundary metering?

A meter can be placed at the boundary of a high-rise residential or commercial complex, and represents the final point of services we provide (see Figure 4.2). The complex is then served by a centralised energy provider, who is a third party that owns, installs and maintains utility network infrastructure beyond the meter. Another name for a centralised energy provider is an embedded network provider, or ENP.

We first introduced boundary metering and the associated boundary meter tariffs into NSW in 2015. This type of metering is also prevalent in other jurisdictions, being the predominant gas metering arrangement for high-rise complexes.

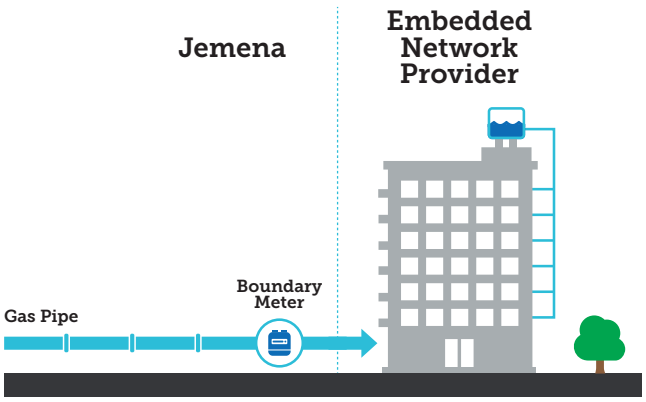
There is demand for boundary metering

Boundary metering is our fastest growing metering solution. This means that the market for companies that offer gas embedded-network solutions is growing and becoming more competitive.

We expect ENPs will provide gas or hot water to around 106,000 apartments by 2025. There are currently 12 active ENPs in NSW, and we would like to facilitate the market to ensure customers have a great gas experience.

It is therefore timely to refine the solutions we offer, to ensure this market develops efficiently and for the benefit of customers.

Figure 4.2 Boundary metering



Our refinements

For new high-rise sites or other centralised hot-water developments that receive their Construction Certificates after 1 July 2020, we will offer two connection solutions:

- Individual gas metering, where the high-rise has individual gas hot-water systems for each apartment
- Boundary gas metering, where the high-rise has a centralised hot-water system.

This means we will not offer hot water metering services to new sites from 1 July 2020. Where required, these will be provided by an ENP.

For the avoidance of doubt:

- The two remaining solutions are already available, with the boundary gas metering solution already applying to approximately 13,000 apartments
- The changes do not impact any existing high-rise sites with gas hot water metering or those that receive their Construction Certificates prior to 1 July 2020. We will continue to provide individual gas and hot water metering services for these customers as required.

We describe the changes and provide information sheets on our website here:

- For developers: http://jemena.com.au/gas/developers
- For customers in new high rise apartments with centralised hot water: https://jemena.com.au/gas/home-and-business/new-high-rises

Tariffs that support boundary solutions

In setting prices for our boundary tariffs we have to find a balance between:

- Cost-reflectivity to ensure similar customers pay similar prices—to meet our pricing objective to drive economic efficiency.
- Providing incentives for gas ENPs to participate in the market to meet our pricing objective to keep gas competitive—should developers choose electric solutions rather than gas for their high-rise developments, all else equal this would apply upward pressure to JGN's future prices for other customers due to a relatively smaller customer base to share costs across.
- Positive customer outcomes – as noted above, by enabling the end-product delivered by the ENP, be it gas or hot water, to be delivered at competitive prices—reinforcing our pricing objective to keep gas competitive.

We have therefore refined our boundary tariffs strategy to balance these goals (see Attachment 4.1).

Impacts of our proposed changes

We summarise how these changes will impact us and our stakeholders in Table 4.1.

Table 4.1 Impacts of new boundary metering solutions

These changes impact how Jemena is future proofing the network by	These changes impact customers by	These changes impact developers and ENPs by
– Reducing our capital expenditure by around $6M per year, which helps us to limit growth of our regulated asset base – Keeping gas competitive by lowering our costs and ensuring that gas embedded network solutions are a viable alternative to electricity network solutions. – Focusing us on our core strengths of providing network transportation services.	– Improving affordability by putting downward pressure on all customers' bills. – Increasing the number of end-customers who are serviced by an ENP rather than a retailer. – Embracing specialist service providers that can enhance customer experience (for example, via 24 hour customer support helplines). – Providing the ability to respond to clearer price signals. ENPs generally charge in cents per litre of water rather than dollars per GJ of gas. This means that customers pay for the amount of hot water they use, and are not subject to the more confusing conversion of water usage into gas usage when provided a gas bill, which can be impacted by vacancy rates within their building.	– Simplifying the metering solutions we offer – Facilitating the market size and incentive to participate – Aligning the NSW practice with other gas and electricity distributors in Australia.

The impact on choice

Our change speeds up the movement of the market towards boundary solutions for high-rise buildings with centralised hot water. More customers will be serviced by an ENP, which means that the ENP charges customers for the services they provide and there is no requirement for customers to have a gas retailer. This means the prices faced by the customer will depend initially on the developer's—and then the body corporate's—negotiation with the ENP. The body corporate has the ability to change ENP, but may be subject to exit fees.

The impact of our change is an expected increase in customers serviced by an ENP to around 106,000 by 2025. If we do not make this change, we estimate that there would still be around 67,000 customers serviced by an ENP given the natural take-up of the boundary metering solution. We have found from stakeholder feedback that this has brought to the fore some existing concerns about the level of customer protections and access to ombudsman services for those customers serviced by an ENP, similar to those we raised as part of our 2015 Access Arrangement.[2]

We will continue to work with the regulators and appropriate bodies, including the Australian Energy Market Commission (AEMC), NSW Government and the Energy & Water Ombudsman NSW (EWON) to promote fair outcomes and a positive gas experience for customers.

Engagement shaped our approach

In our Draft 2020 Plan, we outlined that our new approach to high-rise metering solutions was developed following consultation with our Customer Council, a range of developers and strata managers, NSW Government and City of Sydney, the Public Interest Advocacy Centre and EWON. Those engagements led us to:

- Align with other jurisdictions
- Develop simplified explanatory material at the links provided above
- Set a 1 July 2020 start date to ensure developers have time to cater for the changes
- Continue to engage on ways to enhance the end-customer experience of gas and related services.

In response to our Draft 2020 Plan:

- PIAC supported our approach to minimise capital expenditure but also raised the concern of the ultimate impact on households. It encouraged us to continue to work with the AEMC and other stakeholders to ensure appropriate support and protections for these households.[3]
- ECA noted the capex benefits and sought more information on the "broader implication for the consumer and how the broader costs and benefits play out".[4]

2 JGN 2015-20 Access Arrangement Information, Chapter 13, 30 June 2014

3 PIAC submission, section 3.1

4 ECA submission, p. 11

Our Draft 2020 Plan generated further stakeholder interest in our proposed high-rise approach, in particular at our 19 February 2019 deep dive session with the AER and customer advocates. This interest primarily centred on end-customer protections and outcomes, and uncertainty over the comprehensiveness and appropriateness of the regulatory arrangements in place for ENPs. We understand there is interest in:

- What this means for end-customers "retailer choice" given they can only change their ENP by way of a collective body corporate decision and have no individual ability to replace them with another ENP or a retailer.
- Clarifying the ability for ENPs to obtain retailer exemptions and for customers to access ombudsman facilities.
- Whether a solution with an ENP provides a cheaper overall outcome for the end-customers in the apartments.

The first two points above and the issues raised by PIAC and ECA are topical issues being considered by the Australian Energy Market Commission (AEMC) for electricity networks. While the AEMC is more advanced in its consideration of electricity embedded networks, it will also consider the extent to which there may be benefits in developing a national framework for gas embedded networks, and what such a framework should cover.[5] We have inputted into this process indicating our support for the AEMC to consider gas embedded network arrangements as well as how they can apply to the provision of hot water services.

We support solutions for gas and hot water customers equivalent to those found to apply in electricity, unless there are valid reasons for different approaches. We also note that in Victoria, residential bulk hot water customers have access to their Energy and Water Ombudsman, who provide an information sheet for customers. We support having similar clarity for NSW bulk hot water customers.

With regard to a better and cheaper overall outcome for end-customers, we consider that our approach to no longer provide hot water meters is facilitating competition to drive positive market outcomes. Hot water meter provision, servicing and reading is not JGN's, or other gas distributors', core business. We are conscious that where we currently provide these individual hot water meters, we do so to the exclusion of other potential providers that may be able to deliver better customer outcomes.

It is worth noting that whether or not we adopt our proposed approach outlined above, we will not make any of these raised issues more or less pressing for current end-customers serviced by an ENP. Developers in NSW can, and increasingly are, choosing gas ENP solutions. ENPs remain the norm in other jurisdictions. This is why we are participating in the AEMC process and any subsequent or concurrent legislative processes to help facilitate positive customer outcomes.

5 AEMC, Draft Report, Updating the regulatory frameworks for embedded networks, 31 January 2019

4.4 Improving price stability – price path

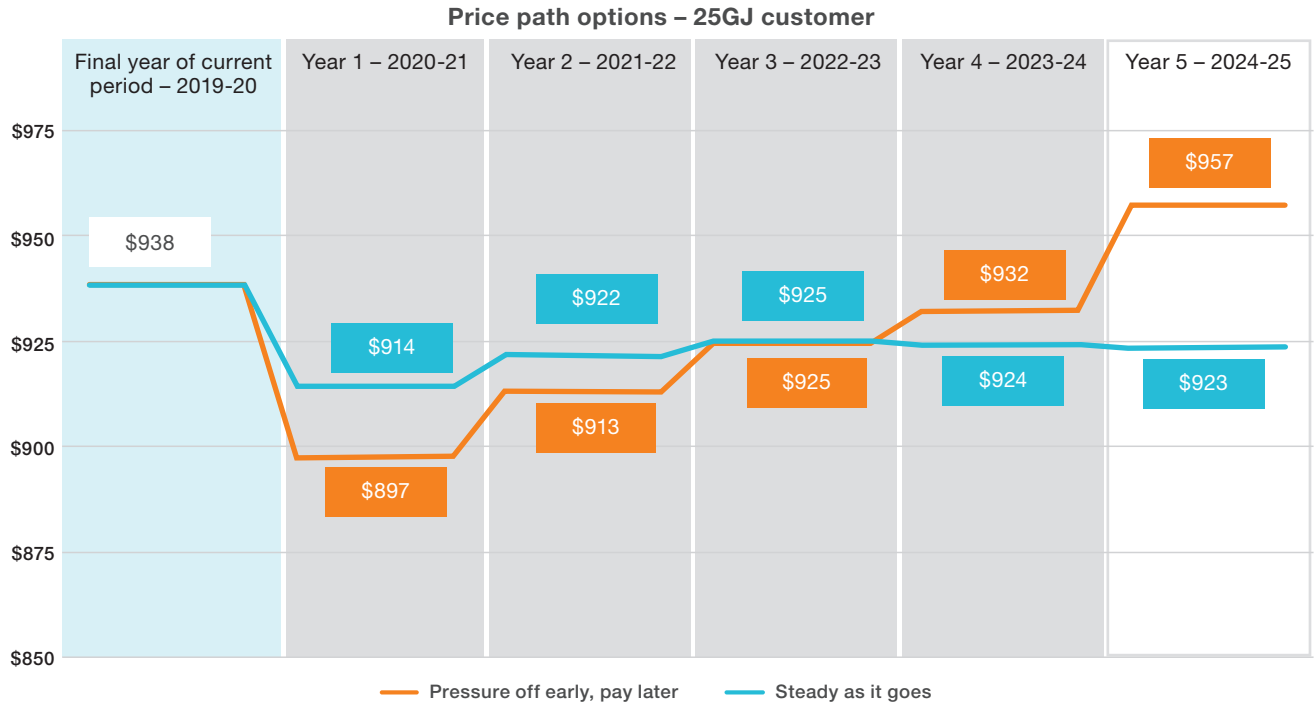
Under the regulation that Jemena is subject to there is some flexibility about when we receive our allowed revenue, so we sought customers' views on how they would prefer to receive any price decrease across 2020-25.

At our deliberative forums across five NSW locations, we offered participants the option of two scenarios:

- **Steady as it goes**—where our network tariffs are balanced across the five years to counter expected movements in other areas of the supply chain, with the goal of achieving a smooth retail bill.
- **Pressure off early, pay later**—where our network tariffs are aimed at maximising the year 1 price decrease.

Figure 4.3 compares the two scenarios for a 25GJ Jemena residential customer. This demonstrates how annual retail bills were estimated to change under each scenario.

Figure 4.3 Price path engagement



Note:

a. These were the examples presented to customers and are indicative only. They do not present the revenue requirements in this 2020 Plan.

b. Bill amounts were presented and explained as what the customers would actually see in that year when they opened their bill.

c. Both scenarios provide us with the same revenue allowance.

What we heard from our customers

Residential customers

The response from all deliberative-forum locations, independently of each other, was an overwhelming preference for a 'steady as it goes' price path.

Participants considered this scenario provided:

- Greater certainty over prices and long-term affordability, which was desirable
- An 'insurance' against the potential for future price increases, at a time when other household bills could be increasing
- Greater buying power for those households who will see salary and wage increases over the five years, but also helps those more vulnerable households who may not.

At our fourth deliberative forum, we:

- Presented our Draft 2020 Plan price path that provided year-on-year real price decreases.
- Highlighted that this price path is most likely to deliver the steady as it goes retail bill scenario.
- Noted that this could still change due to a number of factors, including applying their preference for steady bills beyond 2025.
- Confirmed that their preferences for smooth bills extended beyond the five years of our 2020 Plan.

We asked customers at this fourth forum how well they considered we had incorporated their views on price path developed over the first three forums into our Draft 2020 Plan. Ninety one per cent of forum participants considered that we had met their preferences for price path either quite well or very well. The remaining 9% considered we had met their preferences somewhat well or were neutral to the question. Some of the recorded feedback from participants included:

'Totally agree with this' (Griffith)

'Absolutely accurate as to what the Bathurst forum asked for. I agree (personally) with the decision to have "steady as it goes"'.

Large customers

We tested the same proposition with our large (demand) customers at a November 2018 forum. Large customers have different drivers to residential customers, and often from each other. Network tariffs are generally a smaller portion of a large customer's final gas bill and can vary based on the circumstances of the customer—we estimate that for most large customers, network costs vary between 10% and 20% of their bill. It is therefore harder to show average large customer bill impacts. Because of this, we modified our approach from that of residential customers. We asked whether they preferred us to recover our revenue evenly over the five-year regulatory period—implying steadier network prices—or to recover less revenue at the start of the period and more towards the end—implying initial network price relief followed by price increases.

Seventy-five per cent of large businesses attending our forum preferred that we recovered our revenue evenly. However, the remaining customers indicated initial price relief was preferred in the short term.

Our response

We heard from our residential customers during the third and fourth forums that they prefer smooth retail bills over the five years of our 2020 Plan, but also that we should not view this in isolation of what might occur beyond the 2020 Plan. We have therefore modified the price path from our Draft 2020 Plan, which had provided for year-on-year real price decreases. We consider that, in combination with the revenue we are handing back, this price path would have created the potential for our 2024-25 prices to fall too far below our cost of service. Given we are more likely to meet customers preferences by avoiding a potential 2025-26 bill shock, our proposed price path has more of a "dip and return" feature (see Figure X.2). In combination with the expected movement in wholesale gas prices, we consider this price path is most likely to achieve smooth retail bills across 2020-25 and beyond (see Attachment 7.1 for more details).

We also recognise that different customers have different preferences. While there is a preference for price stability, this is interpreted differently for volume customers—who prefer stability at the retail bill level—and demand customers—who prefer stability at the network bill level.

We consider that we can balance the contrasting positions by a price path that:

- is developed to best deliver smooth retail bills for volume customers based on our current forecasts of price movements in other parts of the supply chain, and
- enables us, in combination with our side constraint, to provide large customers with more consistent network tariffs.

Balancing the contrasting positions requires us to retain some flexibility to change one group of customers' prices by more than another set of customers in any year. This flexibility is currently provided within our form of price control that allows us to change any one price for a tariff by 10% more, or less, than the average price movement for that year. This is called a 'side constraint.' Lower side constraint levels would limit our ability to deliver what our customers have asked for.

We have traditionally recovered around 10% of revenue from our large business (demand) customers and 90% of our revenue from our residential and commercial customers (volume) customers. Our approach would maintain this split over the five years of our 2020 Plan, but create some minor year-on-year variance from this to best meet customers' preferences. Our proposed price path is provided in Chapter 7.

4.5 Other changes we are making to our prices and services

Our proposal includes a number of other specific changes to our services and how we price these. These are detailed in Attachment 4.1. These include:

- Minor changes to the description of our services, with an explanation of how our pipeline services meet the updated requirements in the National Gas Rules
- Improved services, clarity and cost-reflectivity for our user-requested ancillary activities
- Minor updates to our annual process to update tariffs (our tariff variation mechanism)
- Simplifying our process for large customers to reset their chargeable demand levels.

Attachment 4.1 also covers areas of Rules compliance to check the efficiency of our tariffs.

Attachment 4.2 provides minor updates to our cost pass through mechanism.

05

Our planned capital **investments**

5.1 Our investment approach

Each year, we make significant capital investments in our network. These investments ensure that we can continue to supply a safe, reliable and affordable gas service that customers want.

Table 5.1 Capital expenditure over time by category ($2020, Millions)

	2010-15		2015-20		2020-25	
	Allowance	Actual	Allowance	Actual/ Estimate	Draft 2020 Plan	2020 Plan
Connections	451	436	397	592	449	480
Metering	145	99	193	106	143	146
Facilities and pipes	91	69	125	78	90	89
Information Technology	106	142	148	119	103	107
Augmentation	85	118	110	50	97	75
Mains replacement	24	21	75	34	67	55
Others*	48	99	45	47	30	35
Change in how we recover corporate overheads**	-	-	-	-	-78	-76
Total gross capital investment	**951**	**984**	**1,094**	**1,025**	**901**	**913**
Customer contributions	**25**	**41**	**22**	**15**	**11**	**13**
Total net capital investment***	**926**	**943**	**1,071**	**1,011**	**889**	**899**

Notes:

* Other includes property, fleet and SCADA (the system which controls our network).
** We are changing how we recover our corporate costs. For more details see section 6.3.
*** This net capital investment does not take into account asset disposals.

Our capital expenditure program is focused on customers, will reduce risks, maintain our current service standards and reduce bills.

Our planned investments (summarised in Table 5.1) includes:

- connecting new customers (which constitutes over 50% of the capital program) to spread our fixed costs across more customers and lower bills;
- replacing assets which are no longer performing, such as inaccurate meters or deteriorated mains;
- keeping our systems up to date and secure from cyber-attacks.

For most of our program the link between the investment and what customers have told us they want is straightforward.

However, some investment choices require balancing trade-offs. For instance, given the uncertainty surrounding the gas network do we invest less now risking higher costs in the future? Or do we invest more now risking that we build assets are not fully used?

These decisions require an in-depth understanding of what customers prefer and value, taking into account the trade-offs of each specific investment.

We sought customer guidance and made these investment decisions with customers' preferences and values in mind. We then went back to customers and verified that we had heard them and made decisions consistent with their direction.[6]

5.2 Our performance

Our historical performance

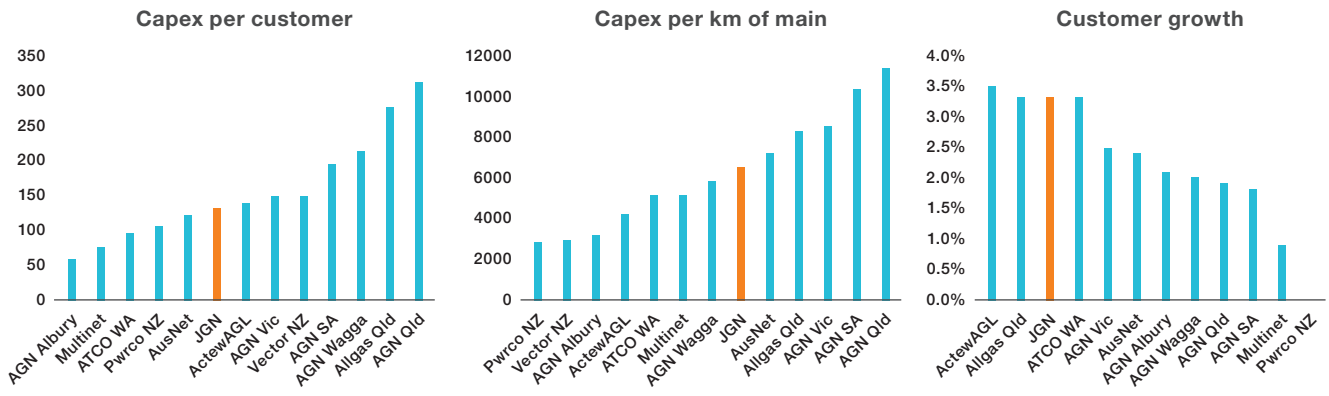
We have a track record of efficient and prudent investment.

Given our history of private ownership and the nature of gas being a fuel of choice, we are driven to maintain gas' competitive value proposition.

We strive to constrain our levels of investment (and consequent price impacts), without compromising safety, reliability or impeding access to our network.

Our success flows through to high level benchmarks which show our competitive performance against other Australian and New Zealand businesses (see Figure 5.1 and Figure 5.2).

Figure 5.1 How our customer growth and capital expenditure compares to other Australian networks ($2010)



Source: JGN, based on Economic Insights data (Attachment 6.4). Charts rely on the longest time horizon presented: capex is average over the last five years; customer growth is since 1999 (or earliest available).

6 For more details on how we recover these costs over time see section 7.3.

Our investment performance has been delivered in an environment of mounting cost pressures, including:

- Connecting record numbers of new customers, our network is one of the fastest growing in Australia.
- Managing a network that spans a large geographic area, including Sydney, regional towns such as Dubbo and Griffith along with major regional centres such as Newcastle and Wollongong.
- Relatively low customer density, increasing the amount of infrastructure we require to serve each customer.
- The additional infrastructure and costs required to safely deliver gas through dense built up areas, such as Sydney's CBD.
- Keeping our network safe despite high levels of construction across NSW. About 45%-50% of all Australian cranes are currently operating in our network area.
- Managing a variety of design standards and construction methods, as our network was formed from several distinct networks.

Despite these factors, and investment requirements all networks face to manage ageing assets, we have been able to constrain our capital expenditure. This can be seen in the benchmarks below, which compare investment growth on a per customer and per kilometre (km) of main basis.

Our efforts can also be seen in productivity metrics. Economic Insights has found that we have the second highest capital productivity of all Australian gas businesses measured.

How we manage capital expenditure

For each of our five year plans, we forecast how much capital expenditure we require to continue to efficiently and prudently manage our network.

The forecast spans seven years as we prepare the forecast two years ahead of each plan.

We generally forecast using a 'bottom up' method, where we add up all of the expected projects and programs. We then review this forecast on a category and network level to identify possible efficiencies and savings.

We take into account a variety of information including what will happen in the wider gas market and the broader economy, as these factors influence wages and connections numbers. We also need to forecast the condition and performance of our network assets, most of which are underground and difficult to inspect.

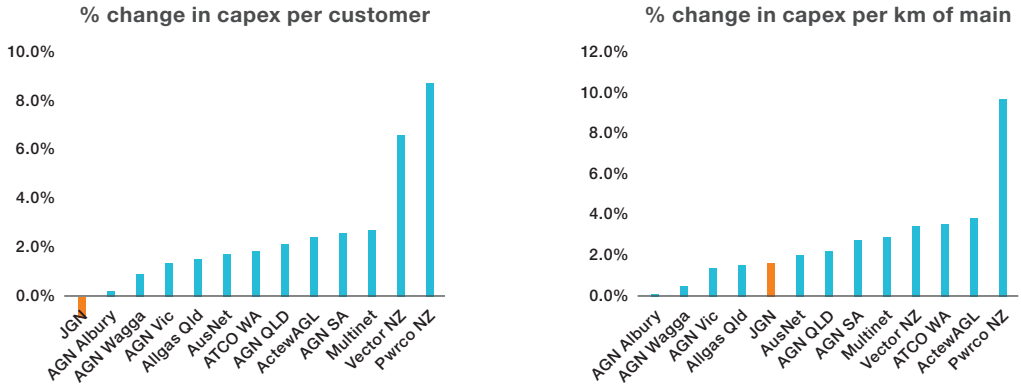
The AER assess whether our forecast as a whole complies with the requirements set out in the National Gas Rules.

Once a level of capital expenditure is set we seek to manage our network within this allowance using our gas network expertise.

Consumers can be confident we apply best practice management systems and processes, as we are the first utility in Australia to be jointly certified to ISO 55001 (asset management) and ISO 27001 (information security management) standards.

We continually assess our network investments to ensure we are appropriately balancing costs and risks to deliver the greatest value for our customers.

Figure 5.2 How our capital expenditure growth compares to other Australian networks ($2010)



Source: JGN, based on Economic Insights data (Attachment 6.4). Charts rely on the longest time horizon presented, since 1999 (or earliest available).

We take into changing circumstances and new information including (but not limited to):

1. **Price/cost movements** which can change which investments represent the most value for money.
2. **Gas market dynamics** which change how gas is supplied to our network and the infrastructure we need to take in gas from transmission pipes.
3. **Greater understanding of our assets** as we continue to operate, inspect and test our assets our understanding of the networks condition and performance improves.
4. **Customer's gas usage** which affects whether and where we need to upgrade the capacity of our network.
5. **Trends in the housing market** which drives the number, type and location of each connection.

Each of these factors are symmetric. Prices can go up or down. Our assets can be in better or worse condition than expected. Connections and peak usage can be higher or lower than forecast.

While these factors are generally beyond our control our response is not. Our performance is dependent on our ability to take advantage of the opportunities and manage the risks that emerge.

As a result, we are constantly reviewing and changing our investment plans. We prioritise the investments required to keep our network safe and those that deliver the greatest customer value.

At times this means that we need to defer our investments, due to budgetary and resourcing constraints. This is generally possible where the marginal cost of delaying an investment is relatively low or where market prices for contractors has risen due to spikes in local construction activity.

Similarly, we have also taken the opportunity to move investments forward when it is efficient to do so. Examples of this include new properties for office and field staff towards the end of last period and the construction of the Sydney Primary Loop in 2007. Neither of these investments were foreseen in their relevant five year plans but led to prudent but necessary overspends relative to the total allowance set.

Our 2015-20 capital expenditure performance

The need to adjust our investment plans was particularly apparent for the 2015-20 period.

The biggest factor was the surge in the number of new (mainly high-rise) dwellings—at levels well above any forecaster had predicted.

We are required to connect new customers, if the expected revenue exceeds the cost.

This not only ensures equal access to gas, but results in substantial bill reductions for existing customers by spreading our largely fixed costs across more customers.

We responded by ensuring we had sufficient funding and resourcing to realise the immense customer value this opportunity presented.

We took advantage of several other factors including:

- Price changes which made it relatively cheaper to inspect our pipelines using intelligent pigs rather than continue with integrity digs.
- Gas market dynamics with APA's cancellation of the Moomba to Sydney pressure upgrade, reducing the need for us to upgrade our country facilities (which take gas from this transmission pipeline).
- Greater understanding of the condition of our assets via the use of statistical sampling to defer the replacement of batches of our gas meters.
- Slower growth in peak demand as penetration of instantaneous hot water systems reaches saturation allowing us to increase the threshold for investment.

Collectively these factors enabled us to fully offset the increased investment in connections.

These changes have direct links to our forecast for 2020-25. In some cases it translates to a lower forecast, such as where we increased our investment threshold. In other areas cost savings realised in 2015-20 has led to a higher forecast for 2020-25. For instance, deferring the replacement of gas meters has shifted spend from 2015-20 to 2020-25.

Overall we are expecting to spend 6% less than the allowance set by the AER. In the previous period we spent 3% above the allowance set.

Differences of this magnitude are normal for gas distribution networks. Recent divergences in Australia have ranged from overspends of 9.9% (for Multinet gas) to underspends of 13.2% (for AGN's South Australian network).

Similarly, in the UK gas distribution businesses are forecasting an average underspend of 11.4% against their total expenditure allowances set by Ofgem, Great Britain's energy regulator.

5.3 Planning our future investments

Earlier in this document, we talked about growing uncertainty in the future of the gas network. This also affects our investment strategy.

In the past, there was never any doubt that our network would continue to grow and be used. But now, despite the large numbers of customers still connecting, growth in peak usage is slowing, average consumption is falling, and the NSW Government has introduced a net-zero carbon policy which could see utilisation of the gas network reduce or even cease altogether.

In preparing our Draft 2020 Plan we considered responding to this uncertainty by either:

- **Investing for the long-term** – with a horizon of beyond 2050, assuming current levels of growth and use of the network will continue, with no impact from policies to reduce carbon emissions. This option delivers the lowest cost solutions. However, if growth does not continue there is a risk we build infrastructure that isn't required.
- **Investing for the medium-term** – with a horizon of 2050, taking into account the risk that future levels of growth and usage reduce. Under this option we avoid building infrastructure that might not be required. If customers transition away from gas this would be the right thing to do. But if current levels of growth and utilisation continue we will have to make additional upgrades later at a higher overall cost.

Our investment program is focussed on customers. We invest when the customer benefits exceed the costs of the investment – consistent with the National Gas Objective and requirements of the National Gas Rules. The only difference between investing for the long or medium term is the investment horizon: whether we include customer benefits realised after 2050 in deciding whether or not to invest.

In considering what investment approach to take, we have not considered when customers pay for the investments made. Given the uncertainty around our gas network, there is a risk that customers in the near term receive most of the benefits while customers beyond 2050 pay most of the costs. We are seeking to mitigate this by aligning when customers pay for and receive the benefits of each investment (see section 7.3).

However, at this stage the uncertainty does not impact all categories of investment. This is true whenever customer benefits provided over the 25 years to 2050 exceed the investment costs. This means at this stage the following categories are unaffected:

- **Connections** – Which will deliver $300M of bill reductions by 2050 (by spreading the largely fixed costs of our network over more customers), even after taking into account the additional investment required.
- **Metering** – We need to replace inaccurate and defective meters so that we can continue to provide accurate billing (and minimise customer frustration), a crucial part of the service we provide.
- **Pipelines and facilities** – Investments required to keeping our ageing network safe. Without these investments we would not be able to continue to safely operate our network up to 2050.
- **IT, fleet and property** – To continue operating our network we need to replace poor condition vehicles and end of life IT systems. These investments don't affect our service beyond 2050, as we do not expect the IT systems and vehicles purchased in 2025 to still be in operation 25 years later.

The main differences lie in those investments which have the potential to deliver consumer benefits over a longer period of time in comparison. Specifically:

- **Augmentation** — In planning our deep infrastructure (the mains that transport gas to local streets) do we build infrastructure to provide enough capacity up to 2050 or do we provide capacity for the longer term (i.e beyond 2050)?
- **Mains replacement** — While we will continue to replace our ageing deteriorating mains to reduce leaks (thereby lowering safety risks, preventing costs from increasing and improving network capacity and reliability), should we go further and replace additional deteriorating mains to reduce costs over the longer term and prepare the network for hydrogen, or some other low-carbon alternative?

Neither option affects safety or reliability. There are different bill impacts depending on whether the gas network is thriving or declining in 2050 and whether we invest for the long term or medium term:

- **If gas network usage declines** network bills will increase regardless of our investment approach, as there will be less customers to spread our largely fixed costs across.

  In this scenario investing for the medium term would be the best approach. It results in smaller bill increases as we avoid building infrastructure that isn't required. The medium term approach saves customers about $12 per year over the next 40 years, relative to the long term approach.

- **If usage of the gas networks thrives**, network bills will fall as we divide our largely fixed costs across more customers, regardless of our investment approach.

  In this scenario the longer term approach is best. Taking a medium term approach would result in lower bills initially but we will have to go back and install additional infrastructure at a higher cost. We estimate that the long term approach would save consumers an average of $2 per year over 40 years.

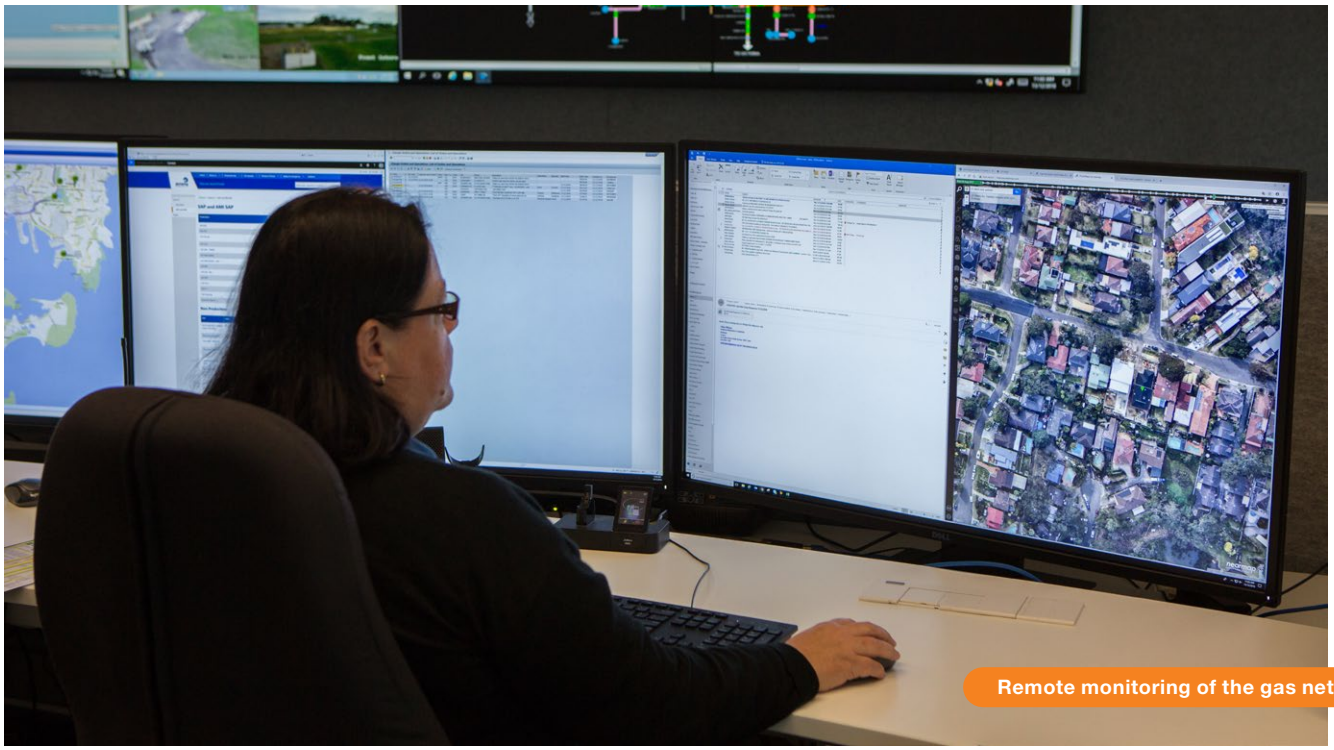
Identifying which option best achieves the National Gas Objective requires balancing competing parts of the Objective. Fundamentally the choice is about preferences.

Only our customers, informed of the trade-offs and consequences of different options, can tell us whether they prefer we shorten the time horizon for recovery of our costs or not, and why.

We used customer feedback to develop our Draft 2020 Plan. While our customers told us to invest for the long term we focused on the underpinning rationale provided by customers and what this meant in the context of each specific investment. We also sought to balance this guidance against other feedback we received, including that affordability is their first priority.

In our Draft 2020 Plan we selected a medium term strategy for mains replacement and a mixed approach for augmentation.

To ensure we heard and acted on consumers feedback correctly we subsequently tested our program with our customers. We outlined how we balanced the guidance they provided and presented details on each specific investment. The majority of our customers supported our plans so we have maintained our strategy.[7]



Remote monitoring of the gas network

7 In our engagement sessions we called these investment approaches "big pipes" and "small pipes" to try and bring the concept to life. Based on customer feedback we have changed the names from big and small pipes to long and medium term to be more clear.

Customer consideration on whether to invest for the medium or long-term at a conceptual level

To develop our Draft 2020 Plan, we engaged customers at a conceptual level to identify whether we should invest for the medium or longer term.

Subsequent to the Draft 2020 Plan we went back to customers to verify whether we had heard and acted correctly. We provided project specific information on what each option meant. The majority of customers supported our approach. Further detail on customer feedback is provided in the following sections on augmentation and mains replacement, as well as Attachment 5.1.

At a conceptual level, most (72%) customers expressed a preference for us to invest for the long-term to avoid future cost increases. The remainder preferred that we take a medium-term view, to reduce the chance we build assets that aren't required.

Customers reacted strongly against the idea of doing rework, and considered it wasteful. They didn't see excess infrastructure as an issue because the spare capacity could always be used in the future. Customers drew parallels with transport infrastructure and told us they preferred projects like the Sydney Harbour Bridge – which provided long-term capacity – rather than temporary 'band-aid' solutions.

Other consequences of rework were also cited as reasons to avoid the medium-term approach. Customers in Newcastle were particularly concerned with minimising traffic disruption, having recently experienced the impact of the construction of the local light rail project. Customers also said they would prefer to minimise the amount of construction – and digging up roads and pathways – in their local community. This sentiment was particularly strong in Goulburn.

Generally, customers considered avoiding cost impacts and disruption was more important than the potential value gained by taking a medium-term approach. The exception to this was Bathurst, where customers prioritised lowering bills today primarily to help those currently struggling to pay.

We asked customers about our investment approach at the same time we asked about faster depreciation (recovering the costs of investment over a shorter period). Some customers had already recognised the inter-relationship, and the vast majority felt most comfortable with faster depreciation and a long-term investment approach paired together.

Customers told us that they were comfortable with paying for new investments earlier as this could be easily reverted in the future with no negative repercussions – but were more uncomfortable with the prospect of having to go back and invest more in the future to make up for less investment today. Essentially they told us that they value the future implications of today's decisions. Implicitly customers recognised that changing asset lives results in a net-present value neutral outcome while changing investment strategies does not.

Of course, not all customers agreed. A small number of customers selected a medium-term investment approach mixed with a faster depreciation option, as they considered this provided a balanced approach to managing risk for future customers. Some others selected the option which provided the lowest bills now (medium-term investment and slow depreciation).

Customers' views about the future influenced their recommendation. Some told us they valued gas and couldn't see it being replaced by other fuels, so saw no reason to adopt a medium-term approach. Others saw significant uncertainty and competition from new technologies, such as solar and batteries.

Customers considered price differently. Many felt that the bill impact between the medium and long-term approaches wasn't significant on an annual bill basis, but recognised that costs added up across all customers and over time. A small number of customers asked us to prioritise the lowest-cost approach now, above all else. Others preferred that we take the medium-term investment approach as they were concerned that vulnerable customers would be left with higher bills as they would be less able to transition away from gas.

Lastly, customers told us to be bold and confidently invest to provide a quality service rather than looking for ways to reduce investment.

5.4 Forecast capital expenditure

Connecting customers to our network

Connecting new customers makes up the largest part of our capital program. It covers the cost of new mains along streets, services to homes and businesses, and meters to measure how much gas is used.

Our connections program benefits customers in two ways:

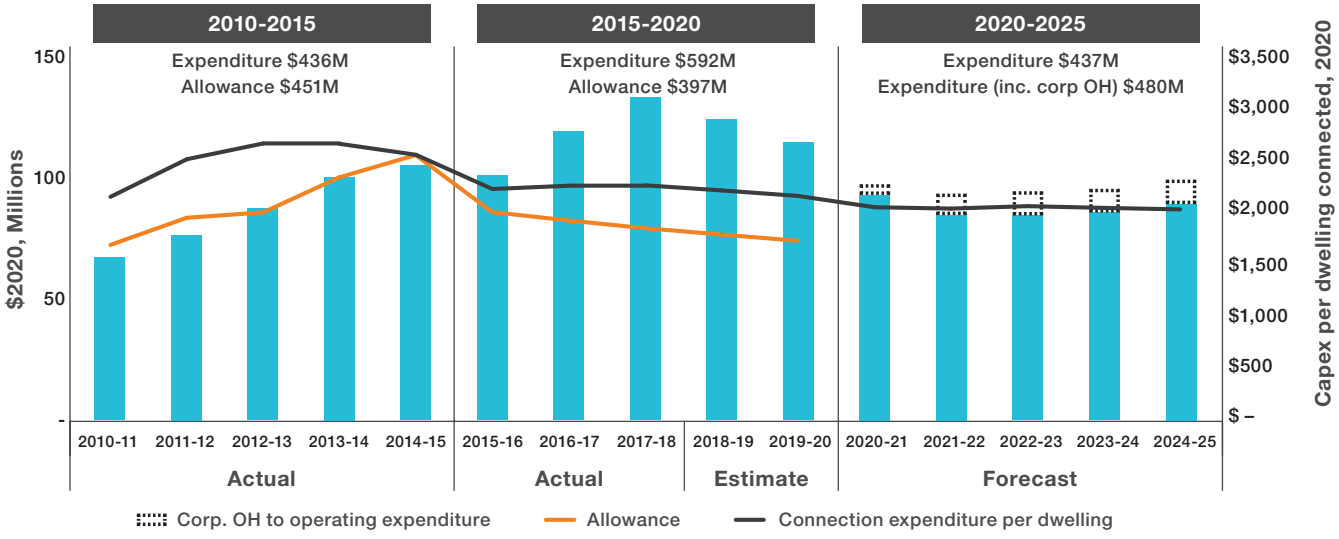
1. **Lowers bills**. A larger number of customers means we can spread our largely fixed costs over more customers.[8] Our investment in connections will lower bills by about $300M over the period to 2050.
2. **Ensuring equal and fair access to the benefits of gas**. Our connections program ensures that people living in new homes can enjoy the benefits of gas. Current customers told us they enjoy the kind of instantaneous heat gas provides (for space heating and cooking) and value the security and reliability from having both an electricity and gas connection.

Over the last few years, new dwelling construction has been tracking at about double 2010 levels. This has led to sustained demand for gas connections. In particular, we have seen a sharp rise in high-rise dwelling construction in the last few years (see Chapter 8).

While connection numbers have increased, our average connection costs have steadily fallen. This is partly because relatively less expensive high-rise connections now make up a larger proportion of connections. But it is also due to our out-sourcing strategy which has enabled us to efficiently increase the resources to respond to the increase in demand for connections while keeping costs constrained.

The exception is existing homes where we have seen reductions in the number of connections and increases in the cost to connect.

Figure 5.3 Connections capital expenditure and expenditure per net dwelling connected



8 This is the case for every connection. We check to ensure the additional revenue we expect to receive covers the connection costs. If a connection is particularly expensive we will ask for a contribution towards the costs so that no existing customers are worse off.

Connecting existing homes is more expensive. They occur in more established areas which require more traffic management and higher costs to restore footpaths. Both of these costs have increased in recent years due to more onerous traffic management requirements and higher charges from local councils.

Connecting existing homes also costs more as we tend to do less at a time. We may only connect a single household in a street while with new homes we lay the mains and services for whole streets at a time.

Our costs and the AER's allowance diverged in the 2015-20 period. This was partly due to the unprecedented building boom in Sydney and the higher demand for connections than originally forecast. The difference is also due to unit rates in the AER's allowance (which we accepted) being set below our costs.

For the next period we are forecasting a drop in connections expenditure. This is due to a reduction in both the number of connections[9] and in the average cost per connection, based on expected changes to supplier charges and that we will no longer be installing individual hot water meters for high-rise apartments (see section 4.3).

Our new approach to connection cost forecasting

The forecast in our 2015 Plan was based on a detailed bottom-up model. We applied the latest contracted prices to historical volumes of work. However, this approach relied on data from different sources and was quite complex.

We have changed our approach to take on-board learnings from the last review.

Our focus is on ensuring that our latest model is simple and transparent.

Connections cost forecasting approach

To forecast connection costs we have developed an approach which:

- Applies a top-down forecast, using revealed costs, consistent with the AER's preferred approach.
- Relies on audited data provided in AER-prepared templates as much as possible.
- Adopts easy to understand forecast methods.
- Adjusts the unit rates for material changes, this includes changes to supplier prices and to reflect that we will no longer be installing individual hot water meters (see section 4.3).

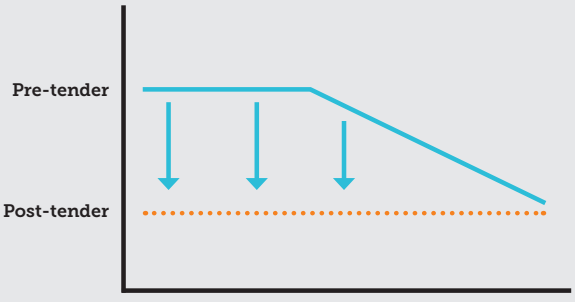
Our approach has 3 steps.

Step 1. Calculate average historical connection costs.

Figure 5.4 Our cost forecasting methodology

Step 2. Make an adjustment to reflect the latest expected unit rates we pay our suppliers. For this plan we are adjusting our prices down as we expect to lower the prices paid to our suppliers through a mix of re-tendering and benchmarking.

Figure 5.5 Adjusting the historical costs to reflect the change in supplier costs



Step 3. Make another adjustment to reflect our change in approach for new apartments with centralised hot water systems. From 1 July 2020 we will only be offering boundary metering for these buildings (see section 4.3). This change will reduce our capital expenditure by $30 million over five years.

9 Our connections forecast is discussed in section 8

Ensuring our meters are accurate

The second largest component of our capital expenditure forecast is our meter replacement program. The internal components of meters wear over time and become inaccurate, or simply stop working. We replace these meters so that we can continue to issue fair bills and continue to supply gas.

We have seen remarkable performance of our residential gas meters. Although only designed to last 15 years, we have been able to extend the life of several batches to 20 years and then again to 25 years. This has allowed us to lower our spend (and customer bills) below what we have forecast over the last 10 years.

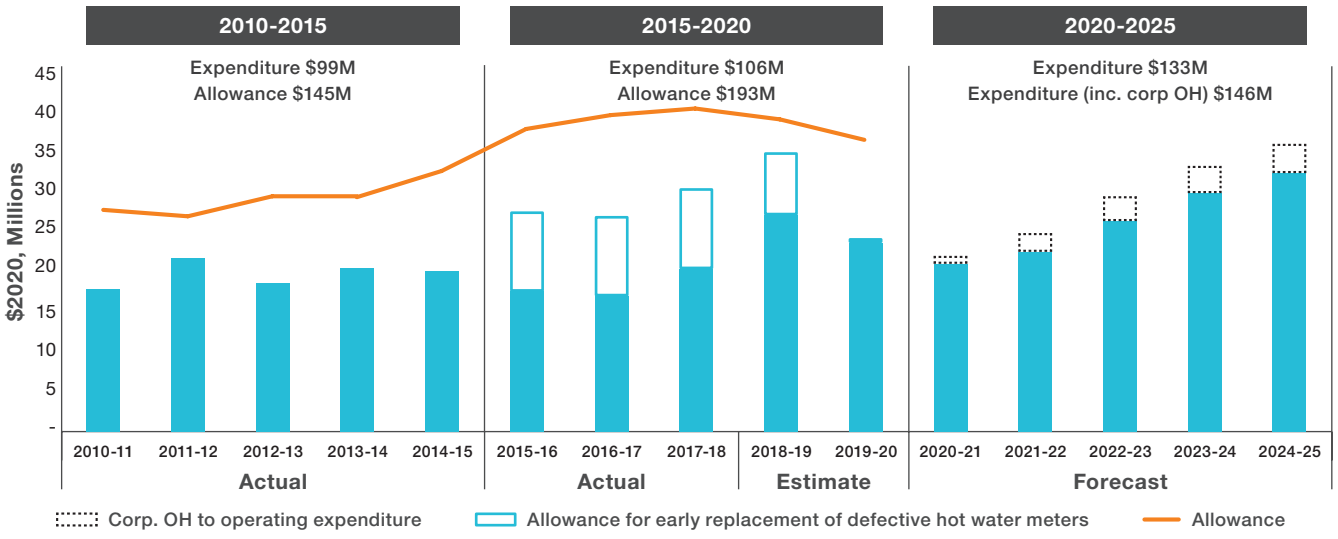
This is in contrast to our fleet of hot water meters which typically do not last as long, due to the life of the inbuilt battery.

In preparing our plan for the 2015-20 period, we anticipated that we would need to replace large numbers of hot water meters due to high failure rates of those installed in the early 2000s – when they were less than 15 years old.

Subsequently, the failure rates returned to historical levels. We believe this is because that vintage of meters were affected by a specific flaw. We evaluated the program and concluded that the meters that were going to fail already had. This allowed us to defer significant amounts of replacement and avoid spending unnecessarily. This was the main driver of the significant underspend over the 2015-20 period.

Our 2020 Plan takes into account the best information we have on the current performance of our gas and hot water meters. We use this information to forecast how many meters will fail or become inaccurate. While we have been able to extend the life of many of our gas meters they eventually wear out and need to be replaced. In the 2020-25 period we are expecting expenditure to increase as we replace more meters as our meter fleet ages and more meters become inaccurate.

Figure 5.6 Metering capital expenditure



Keeping our high pressure facilities and pipelines safe

Our high pressure pipelines are the arteries of our gas network. They transport gas from transmission pipelines to pressure reducing facilities allowing gas to be transported through lower pressure mains.

Over the last 10 years we have made relatively small investments in our facilities and pipes to upgrade capacity where needed and to improve safety. For instance, we installed additional valves which allow us to shut off the gas supply in certain locations if there is an emergency.

Our 2015 Plan took into account a planned pressure upgrade of the Moomba to Sydney Pipeline (owned and operated by APA) which transports gas to our network. This change would have required upgrades to seven of our country facilities which take gas from the APA transmission pipeline. However, the pressure upgrade did not occur so we cancelled these projects.

We have not included any of the facility upgrades for capacity reasons in our 2020 Plan.

Our focus over the 2020-25 period is on maintaining the safety of our ageing network largely through three programs: inspecting the Sydney primary main, relocating our pipework and managing the safety of our older facilities.

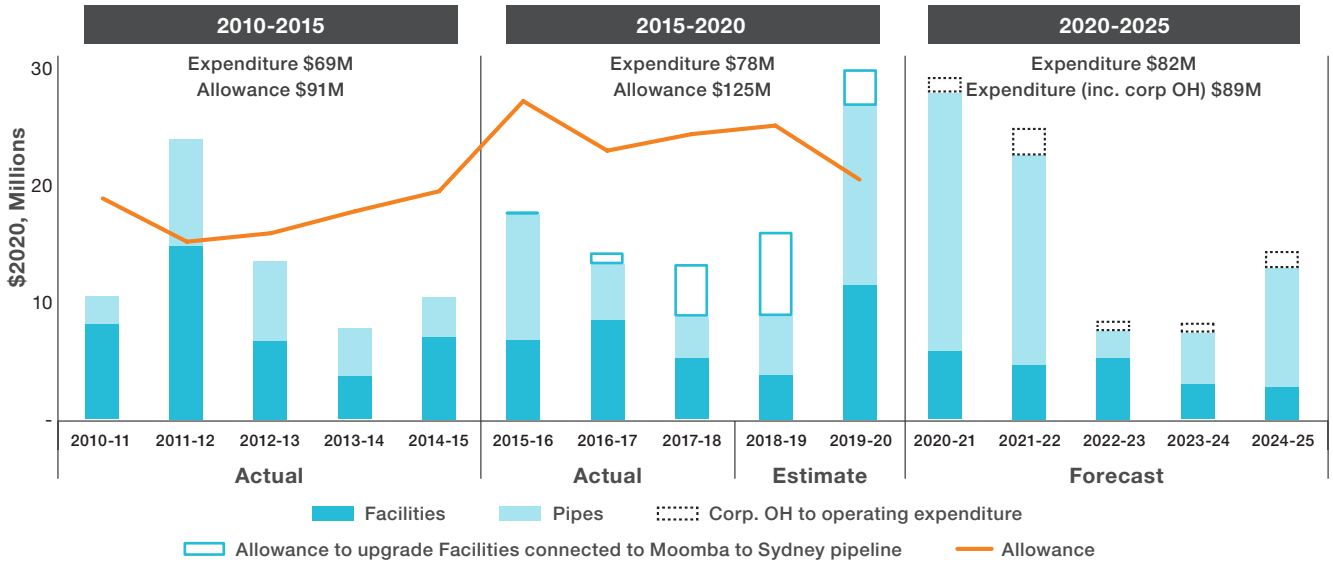
Inspecting the Sydney primary main

The Sydney primary main is the central artery of the gas network in Sydney. As the pipe is underground, it is difficult to directly inspect for damage or corrosion that could lead to a gas leak. A gas leak from the Sydney primary main poses a significant safety risk due to the high pressure of gas within.

We currently verify the condition of the main and the materials put in place to protect against pipeline corrosion by conducting spot checks by digging holes and inspecting the condition of the pipework. We then use the data collected to infer the pipe condition and operational safety elsewhere. These spot checks can also be expensive given the restoration work and traffic management required.

The risk of corrosion increases over time. This is because the protective materials are more likely to have degraded and there is a greater chance the pipeline has been damaged by a third party (and not reported or detected).

Figure 5.7 Facilities and pipelines capital expenditure



We plan to make modifications to the pipeline to inspect the pipeline more thoroughly through the use of an intelligent pipeline inspection tool commonly referred to as a 'pig' which inspects the thickness of the pipe wall from the inside. Pigging the pipeline periodically provides a complete picture of the condition of the pipeline allowing us to identify and correct material defects. Over time this option will be cheaper than conducting spot checks.

Before we can use a pig, we need to modify the pipe in certain locations to ensure the pig can travel through tight bends. We also need to modify the main to be able to send and receive the pig. The pig will tell us whether there is any damage or corrosion to the main we need to fix.

Relocating our pipework

When we design the network we aim to lay high pressure pipes away from populated or sensitive areas. The benefit is twofold. Firstly, this lessens the chance the pipework is damaged and secondly, it lowers the risk to the public in the event that there is a gas escape.

However, as Sydney has grown, the built environment around our trunk and primary pipelines has changed. In many areas there has been significant development. In one instance, a school has been built in close proximity to the primary main, with the main now in the school grounds. This has changed the risk and consequence of a gas escape.

We intend to improve public safety by relocating certain pipes. In some cases this means moving the pipeline, while in others it means relaying the pipe at a deeper level.

While damage to our high pressure mains is rare (due to the measures we currently have in place) the impact on public safety and the economy can be significant.

Case study: secondary main hit in Martin Place

In July 2018 an excavator hit a secondary main in Martin Place leading to a significant gas escape. We were able to lower gas pressure to a safe level, then repair the pipe without any harm to the public or employees. However, to protect the public, a 200m exclusion zone in the centre of the city was put in place and Martin Place train station was temporarily closed.

The economic impact was limited due to the hit occurring late Friday night, but the impact would have been materially higher if it had occurred during business hours.

Managing the safety of our older facilities

Many of our facilities are approaching their original design life of 40 years. We test these facilities for continued safe operation and review whether we can extend the life of safety equipment or whether we need to build replacements. We have found that our facilities can continue to be safely operated if we replace their obsolete and degrading electrical and instrumentation systems.

Figure 5.8 A magnetic flux leakage inline inspection tool known as a pig

Maintaining our information technology

IT and Communications underpin the delivery of safe, reliable and cost-effective gas services to customers. IT provides the essential platforms which support almost all of our operations, including:

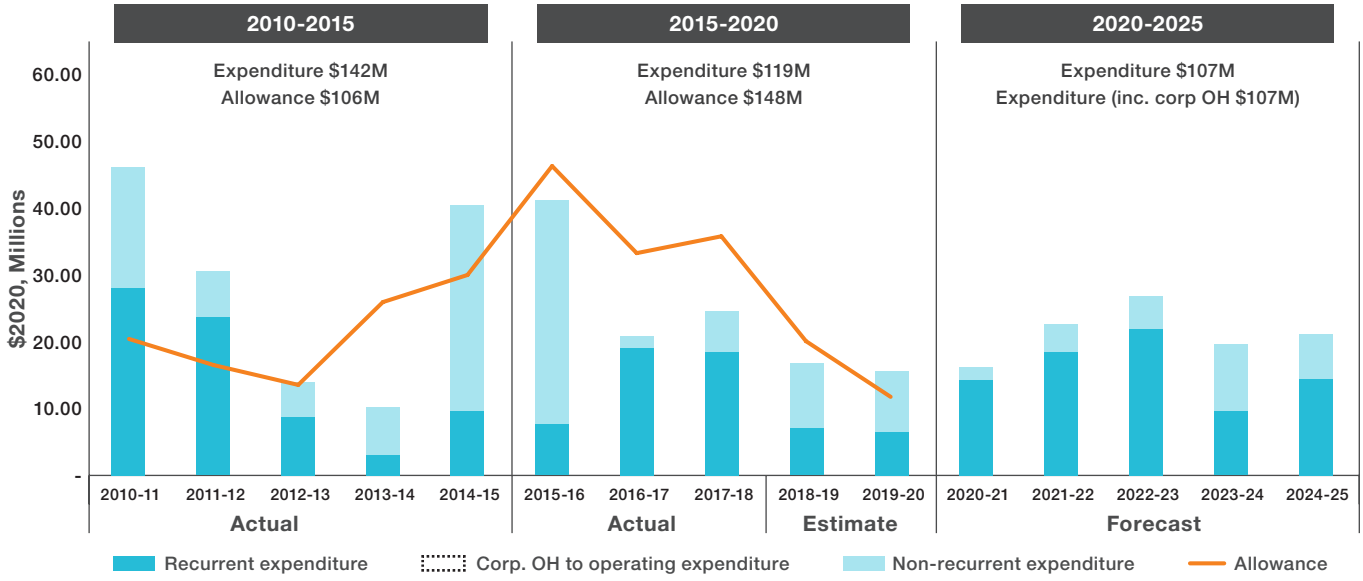
- Meter reading and customer billing.
- Maintenance planning and works management.
- Management of all data and business record keeping.
- Corporate support activities, including finance, reporting, human resources and procurement.
- Cyber security protecting all technology and network operations.

Over the last several years we have undertaken a major overhaul of our legacy technology systems. A significant component has been our transition from the 25 year old, internally built GASS+ system to a modern enterprise wide information management system (SAP) which supports our billing, works management, corporate processes and reporting functions.

The change program has resulted in a major reduction in the number of legacy systems primarily through the consolidation of several disparate systems to streamline our processes. We have also implemented a new Geospatial Information System, introduced a new Field Mobility solution (providing field workers with access to our IT systems and improving data collection) and upgraded our customer relationship management and reporting platforms.

The technology improvements provide core foundation capabilities for the gas business well into next decade. The graph below provides a mix of historical and forecast data over 15 years.

Figure 5.9 IT capital expenditure



Note: IT capex doesn't attract corporate overheads in our current Cost Allocation Method (CAM) – see section 6.3.

Our 2020 Plan continues to leverage the investment already made in enterprise IT platforms.

These new solutions provide us with a modern and more efficient way to deliver services to our customers.

Depending on the type of IT solution, lifecycle replacement typically occurs after 3-10 years and in a small number of cases this may extend to 12+ years. There are a number of factors that contribute to this:

- It is sometimes cheaper to replace the system with a new version than continually upgrading old systems.
- The risks from continuing to run legacy systems can be very high.
- We may no longer be able to expand or extend the system to meet business growth and demand usage.
- The system may no longer be compatible with other parts of our technology stack, such as the infrastructure, hardware, networks or operating systems that all need to work in unison.
- The ongoing security of the service or product may not be assured and may present a potential vulnerability or exposure to security breach. This risks the safe operations of our network and the security of our customers' data.

Building on our strong foundation systems, our projects in the next period include:

- Lifecycle replacement for meter reading systems which manage meter read data and hand-held devices used by meter readers. The current legacy solutions are becoming more unreliable and are no longer compatible with hand held devices now in the market. This approach will help avoid delays which can lead to estimated bills for consumers.
- Partial replacement of our enterprise resource planning system with a focus on corporate finance, human-resources, procurement, payroll along with remittance and payment processing. These support back office functions necessary to deliver services to customers.
- Improving our security and business resilience to counter growing cyber security threats. This will be achieved through a range of initiatives including threat identification, breach monitoring and improving 'identity checks' to ensure only the right people have access to systems. This will allow customers to trust our online services as they mature in the next few years. While it is impossible to guarantee we can never be subjected to a cyber-attack, our plan lowers the risk and improves our ability to quickly respond.
- Opening up new communication channels to provide customers a more seamless experience and support them in a manner they prefer.

Night-time repair works in Martin Place, Sydney

Strengthening our network

Augmentation capex is focused on strengthening the backbone of our network. Over the last 10 years we have completed upgrades to improve the reliability and security of supply, cater for higher levels of demand and to enable us to connect more customers to the network.

Historically we have seen growth in how much gas people use at peak times – on cold winter days. Over the last few decades we have seen peak consumption grow as customers have installed new gas appliances and increased their overall usage. For example instantaneous hot water systems increase peak consumption by using large amounts of gas in short intensive bursts.

Given the history of rising peak consumption we planned for this trend to continue. However, over the current regulatory period, we saw peak consumption growth slow. This is likely due to saturation of instantaneous hot water and a shift to using electricity for heating.

We observed these changes as part of our capacity monitoring and cancelled projects, such as the extension of the Northern Primary main to support supply to the Sydney Northern Beaches, that were no longer required. We have taken the changes in peak consumption growth into account when forecasting future peak demand. As a result we have not forecast any significant capital expenditure due to demand growth from existing customers.

Our augmentation forecast for the next regulatory period comprises three elements. Planning for Sydney's third city: the Western Sydney Aerotropolis, upgrades to areas of the network due to customer growth and the Northern Sydney supply.

Planning for Sydney's third city: the Western Sydney Aerotropolis

A third city for Sydney is being developed with the Western Sydney Airport at its centre. The airport will open in 2026 and will be surrounded by industrial, agricultural and residential development. By 2036, the population is expected to grow by 464,000 and an additional 180,000 dwellings will be constructed.

To supply the Aerotropolis we need to install three sections of secondary steel pipe to supply the core of the Aerotropolis, the Sydney Science Park, and the Airport itself.

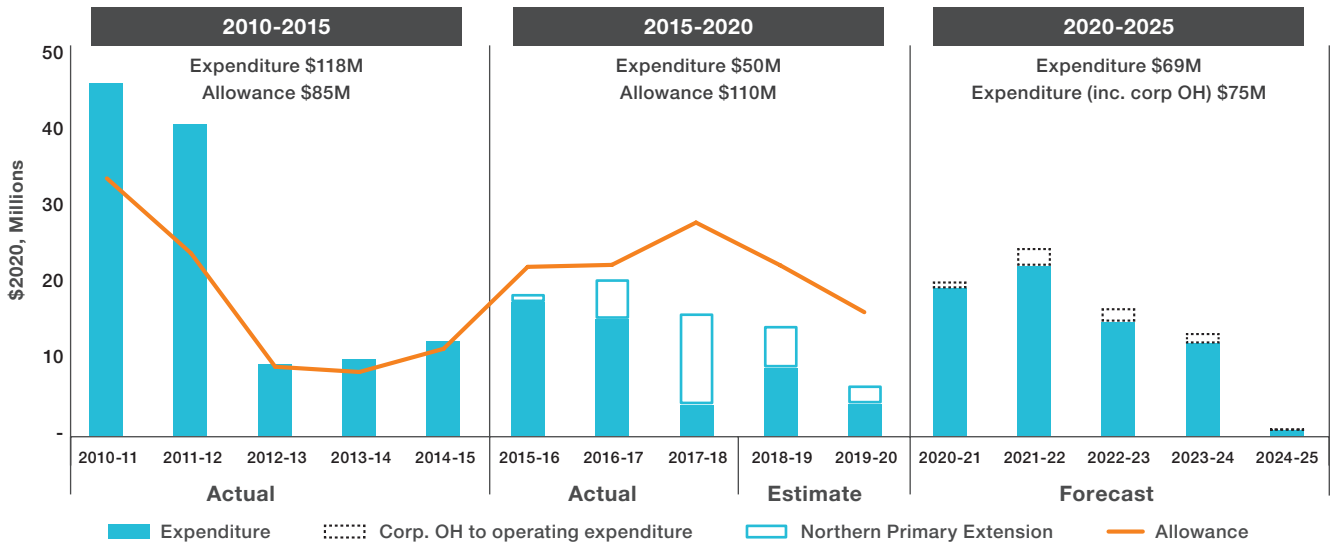
Given the uncertainty around our network, we have considered whether to provide supply for the medium or long term.

In developing our Draft 2020 Plan we consulted with our customers who told us to invest for the long term, but were concerned about affordability.

To balance this feedback we decided to adopt a mixed approach to upgrades to connect new customers. This means where the likelihood of further development is high, and when the costs of providing additional capacity now is relatively low, we would adopt a long term approach. Otherwise we would adopt a medium term approach.

For the Aerotropolis, we could either install 150mm or 250mm pipes depending on whether we took a medium or longer term approach. The larger diameter pipes will provide additional capacity and greater future proofing for further development of the Aerotropolis. But, this option would add costs and provide additional capacity that might not be required.

Figure 5.10 Augmentation capital expenditure



However, we believe that there is a high probability that the additional capacity will be used for the mains to the Aerotropolis core and airport – given the indications from NSW Government of a significant amount of industry, agriculture and new dwellings to be built.

To increase capacity in these areas, it is much cheaper to install a larger pipe now than laying another pipe later on once the area is developed.

We are less confident about the prospect of increasing loads in the region around the Sydney Science Park.

As a result, applying a mixed approach (based on customer feedback as outlined earlier) means installing a smaller diameter main to the Sydney Science Park and a larger diameter main to the Aerotropolis core and airport.

Following to the publication of our Draft 2020 Plan we engaged customers on our approach to check whether we heard their feedback correctly and our decisions was consistent with their direction. We outlined in detail our strategy for the Aerotropolis and how we took into account their guidance.

53% voted in support of our mixed approach as outlined in the Draft 2020 Plan. Most customers who did not support our mixed approach told us to adopt a long term approach for all sections of the Aerotropolis, including the Sydney Science Park.

Given the support from the majority of customers we have retained the mixed approach outlined in our Draft 2020 Plan.

Upgrades to areas of the network due to customer growth

The number of customers we are expecting to connect in the next five years is equivalent to a city the size of Canberra. As well as the Aerotropolis, this requires an investment to reinforce our network along the edges of Sydney where new estates are being constructed.

We will also need to strengthen our existing network due to high-rise dwelling construction. We are forecasting a significant number of apartment buildings to be constructed along transport corridors. Based on customer feedback on our approach to the Aerotropolis, we have also adopted a mixed approach for these investments.

However, in all of these areas either the potential for further growth is low or the cost of installing additional capacity is materially higher. As a result, we have adopted a medium term approach for all augmentation works outside of the Aerotropolis.

Pipeline protection equipment

Northern Sydney supply

As outlined earlier, we are planning on modifying the Sydney Primary Main so that we can use pigging technology to thoroughly inspect its condition, and in turn keep our network safe.

Modifying the section of main from Lane Cove to Willoughby to allow pigging would cost $23M.

However, due to the cancellation of the Northern Primary Main extension, we expect to install two additional secondary mains in the 2030s to maintain adequate supply. These secondary mains will cost $33M, much less than the cancelled Northern Primary Main extension which would have cost about $100M over 20 years.

Building these additional secondary mains earlier avoids the $23M of modification costs required to pig the primary main. This is because it would allow us to reduce the operating pressure of the Lane Cove to Willoughby section of main, an alternative solution to keeping our network safe.

Our 2020 Plan adopts the option to avoid the modification costs, and brings forward the construction of the additional secondary mains.

While the initial investment of modifying this section of the Sydney Primary Main is lower we think it will end up costing consumers more, as the additional secondary main would be required anyway. The trade-off between these two options is whether to prioritise short term affordability (by selecting the option with the lowest costs next period) or reducing costs in the long term (by choosing to spend more next period but lower costs in future periods).

After the publication of our Draft 2020 Plan we outlined the options to our customers and asked for their view. 80% of customers agreed with our approach.

Due to customer support we have maintained our Draft 2020 Plan approach to bring forward the construction of an additional secondary main.

Replacing deteriorated mains

Our network is mostly made up of modern piping materials – nylon and polyethylene – due to significant upgrades undertaken in the 1990s.

However, there are still some pockets of our gas network, built in the 1950s and 1960s, that are cast iron, unprotected steel mains and early plastics. The pipework in these areas is deteriorating. The cast iron and unprotected steel mains are rusting away while the early plastics are subject to cracking.

Replacing these mains:

1. Avoids cost increases from rising repair costs;
2. Lowers safety risks to the general public (from leaks) and to employees/contractors who work on these mains;
3. Improves supply reliability; and
4. Continues to equalise the level of service of the network. Some customers cannot use appliances such as instantaneous hot water. Replacing the mains in these areas will provide enough capacity and pressure for these appliances to be used. Our customers told us all customers should be provided with the same minimum level of service.

While we intend to eventually replace all deteriorated mains – with modern materials which last much longer – we have adopted a risk based medium term approach. We balance the cost of each piece of work against the customer benefits to prioritise and then rank which areas we replace and when. We believe this approach is consistent with our customers' preference for us to focus on affordability without compromising on safety.

As our network is underground it is not possible to perfectly monitor its condition. We make assessments based on the information from publicly reported leaks, condition assessments and, where it is possible, leak surveys.

Penrith primary main

The Penrith primary main was designed and built in stages to trunk standards to provide long-term supply to Western Sydney and the Blue Mountains. Consistent with the standards of the time, we placed protective barriers above the main to minimise the risk of an excavator hit.

Since it was built, new 'trenchless' technology has become prevalent. This technology allows third parties to easily and quickly install infrastructure by drilling under roads and towards our mains that often parallel roadways.

This change significantly increases the likelihood and safety consequences of a rupture.

We planned to replace a section of the main with a thicker pipe over the 2015-20 period to reduce the safety risk.

We reviewed gas demand forecasts in the region and found that a pipeline operating at trunk pressure would not be needed until 2056.

This enabled us to de-rate the pipeline from a trunk to a primary main and significantly lower the pressure. The pressure reduction allowed us to reduce the safety risk and defer expenditure.

We are not forecasting any similar works in our 2020 Plan.

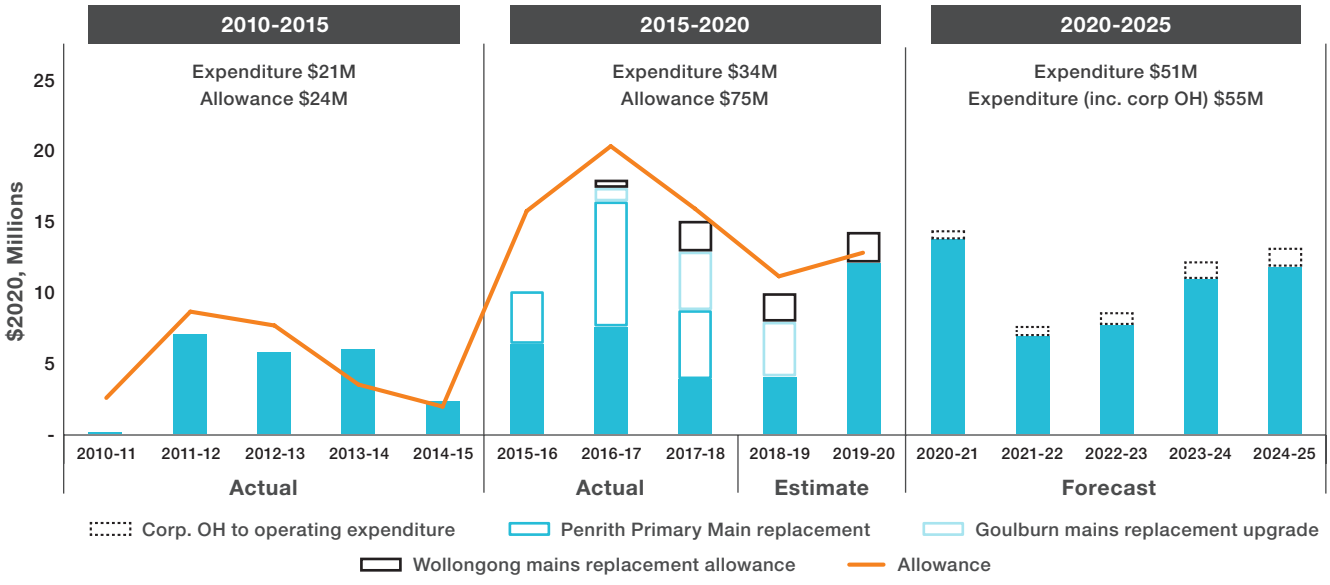
We adapt our program to reflect new information we receive and make sure we do not spend any more than necessary. An example of this is the Mt Druitt network. We discovered that the network had deteriorated faster than expected so we accelerated our replacement program.

The opposite has also occurred. New information about the condition of the Goulburn and Wollongong networks, and on the cost to replace the Wollongong networks, indicated the most efficient option was to defer these replacement works (both have been moved to the 2025-30 period).

We also managed to find cost savings in delivering the Mt Druitt and Kensington network replacements.

Working on a high pressure pipe in the Sydney CBD

Figure 5.11 Mains replacement capital expenditure



Taking into account the results of recent leakage surveys, in the 2020-25 period we are planning to complete the mains replacement works in Matraville – which we are starting this period – and replace deteriorating mains in Newcastle, Mittagong and Kurri Kurri.

Capital expenditure will increase as we are replacing more kilometres of mains. We will replace 85 km of mains this period but intend on replacing 146 km next period. This is mainly due to the large amount of replacement required in Newcastle (136 km, with 104 km being replaced in the 2020-25 period).

Our 2020 Plan includes capital expenditure to replace half of the cast iron mains left in our network. This is based on our current investment approach which aims to get as much use as possible from these older pipes before we replace them. We are only replacing mains when sure performance has deteriorated to a level where the costs and risks from continuing to use the pipe exceed the replacement costs. This approach results in a staggered investment program.

We also considered accelerating the replacement and removing all cast iron mains in the 2020-25 period as we would realise the benefits of the newer materials (and improved safety, reliability and cost efficiency to customers) over a long time period. The cheapest way to replace these mains is to insert modern plastics into the existing mains. However, this reduces the capacity of the networks due to the smaller pipe size. For this reason this option would cost between $60M and $130M extra, depending on how much additional strengthening of the network we need to do.

In considering whether to accelerate the replacement of these mains we considered customer feedback provided. While replacing these mains early would improve the operation of the network (and the service to customers) there is not a clear case that the benefits exceed the additional costs. Further, it would not avoid any rework or disruption, it just changes the timing. As a result we have maintained our approach to stagger the remaining replacement of mains.

Subsequent to the publication of our Draft 2020 Plan, we talked our customers through our approach and why we thought in this example, adopting a medium-term approach was more in line with their underpinning rationale (affordability without compromising on safety).

As 91% of customers agreed with our approach, we have maintained our strategy to adopt a medium term approach for mains replacement.

Newcastle customer sharing his views

The remainder of our investment program

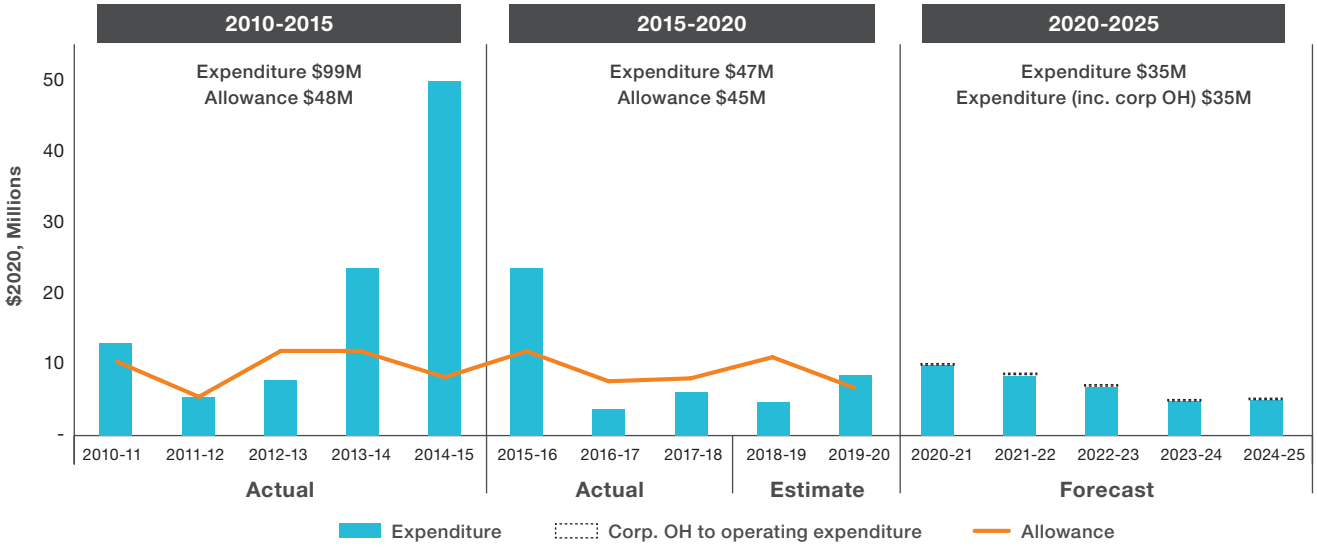
Our last category of capital expenditure covers the replacement of vehicles, updates to our SCADA system – the infrastructure which allows us to control and monitor the gas network – and property for our offices and depots.

Over the last two regulatory periods we have made two major investments. First, in 2014-15 we consolidated our offices and constructed a purpose built depot in Pemulway. More recently we upgraded our SCADA systems to ensure we can maintain supplier support and have appropriate defences against cyber-attacks.

We are not forecasting any major capital expenditure in the 2020-25 period. We will continue to keep our SCADA systems up to date and undertake minor refurbishments to our properties.

We will also continue to replace vehicles, based on their condition, to ensure that our crews are safe and can reliably respond to incidents.

Figure 5.12 Other capital expenditure



5.5 More information on our historical and forecast capital expenditure

More detailed information on our historical and forecast capital expenditure is contained within Attachments 5.1 to 5.5.

06

Our operating **expenditure** requirements

6.1 How we incur our operating expenditure

We incur operating expenditure when we provide our gas distribution services.

Our operating costs are generally repeated, and can be separated into the two high level categories in Figure 6.1.

Figure 6.1 Our operating cost categories

Level 1 category	Level 2 category
Operating & Maintenance (O&M)	Maintenance
	Emergency response
	Management
	Network planning
	Network control and operational switching
	Project governance and related functions
	Quality and standard functions
	Other network overheads
	Information technology (IT)
	Corporate overheads
Other operating expenditure	Management administration and overheads
	Corporate overheads
	Other direct expenditure
	Government levies
	Marketing
	Unaccounted for gas

A word about marketing

Natural gas is a fuel of choice in NSW and competes with electricity and other fuels.

With the warmer NSW climate natural gas must be competitive to attract new customers and encourage them to purchase additional natural gas appliances, particularly for services such as heating. Marketing research tells us that potential customers see the upfront costs of purchasing and installing new natural gas appliances as barriers, particularly when they have many alternatives such as reverse cycle air-conditioning and induction cooktops. Incentive rebate programs have proven to be a highly effective strategy in addressing this barrier and can be targeted to influence customer behaviour by helping them with the upfront costs of buying new natural gas appliances.

Our marketing program is focussed on encouraging the sale and installation of natural gas appliances by establishing natural gas as a highly desirable energy option. It does this by promoting natural gas and working with alliance partners to promote the sale of gas appliances via incentive payments.

Marketing promotes greater utilisation of our network, which helps to lower prices for our customers.

6.2 Overview of current period expenditure

Over the current 2015-20 period, we expect to incur $917M of operating expenditure, which is $40M more than the allowance of $877M approved by the AER.

Our expenditure on unaccounted for gas (UAG), which has risen materially since 2014-15—has been a key driver of this overspend. This is largely due to significant increases in the wholesale price of gas, higher volumes of gas sold to date and an increase in the rate of UAG. Extra spending on UAG accounts for $28M of the overspend.

The other key reason for the overspend is that we are implementing a business-wide transformation program to reduce our operating cost base so that we can achieve sustainable operating cost reductions over the longer term. This program will cost around $13M in 2018-19, and is largely comprised of redundancy payments. These costs are non-recurrent, 'one off' costs that will allow us to achieve sustained lower operating costs in future years (see section 6.4 for details).

Excluding the impact of uncontrollable costs (such as UAG), and the one-off transformation costs, we have been operating within the allowance approved by the AER.

What is UAG?

UAG is the difference between the measured gas entering our network and the gas delivered to customers.

Estimating UAG across a network such as JGN's is complex as it is caused by many different factors.

A proportion of UAG is caused when gas entering our network is lost this is due to 3rd party hits, leaks and venting of gas for safety reasons.

UAG is also caused by measurement errors and timing differences. In this case, gas is not actually lost from the network.

We are responsible for purchasing the additional gas required to replenish UAG. This cost forms part of our operating expenditure.

The rate of UAG has increased over the 2015-20 period due to changes in how flows into our network are measured, but remains within an acceptable range.

Staff inspecting high rise metering

6.3 Our forecast operating costs

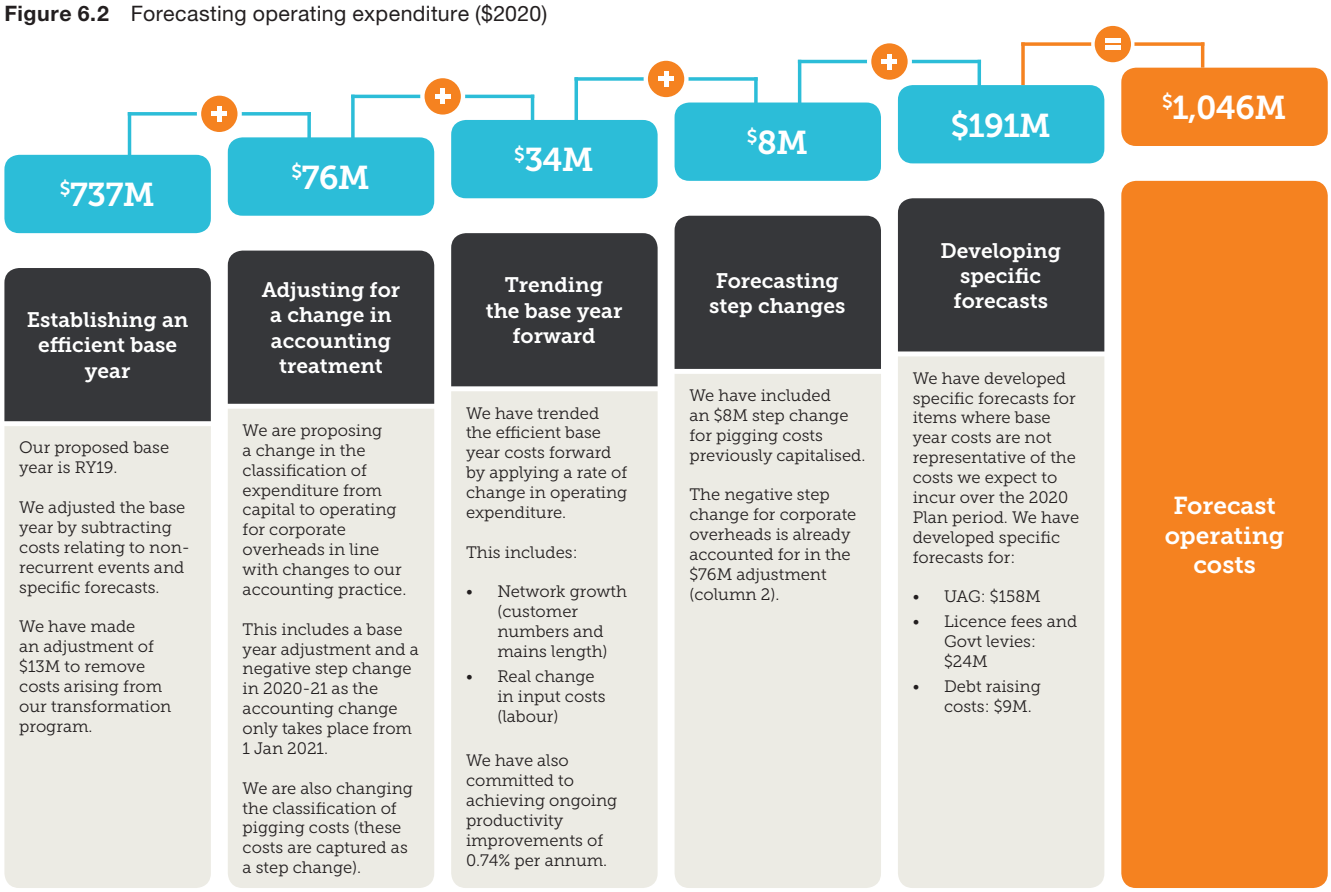
Developing our operating expenditure forecast

In developing our 2020 Plan, we have forecast our operating expenditure using the AER's preferred forecast method, 'base, step, trend'. The method forecasts future operating expenditure using a 'base' year – where the operating costs are representative of the efficient costs necessary to operate and maintain the network, and meet regulatory obligations.

We have also used specific forecasts for items that the base year operating expenditure does not provide a reasonable basis with which to forecast future expenditure requirements.

We undertook a thorough assessment to determine that our forecast operating expenditure represents the amount that is required to meet our obligations and customers' expectations efficiently, and to promote the long-term interests of our customers.

Figure 6.2 Forecasting operating expenditure ($2020)



In forecasting our `2020-25 operating costs:

- we have included a change in treatment of our corporate overheads and intelligent pigging costs that were formerly included in capital expenditure. This will increase our operating costs by approximately $84M ($76M overheads + $8M pigging) over the 5-year period but will reduce our capital expenditure by a corresponding amount.
- we have included an adjustment for the increase in scale of our network, as measured by the increase in customer numbers and the growth in our network mains length. We expect to grow our customer numbers from around 1.41 million customers (in 2019-20) to 1.53 million customers (in 2024-25). This is equivalent to connecting a city the size of Canberra to our network. We also expect to increase the line length of our network by approximately 1,850km over the same period. Adjusting for the increase in scale of our network will increase our operating expenditure by $39M over the next period.

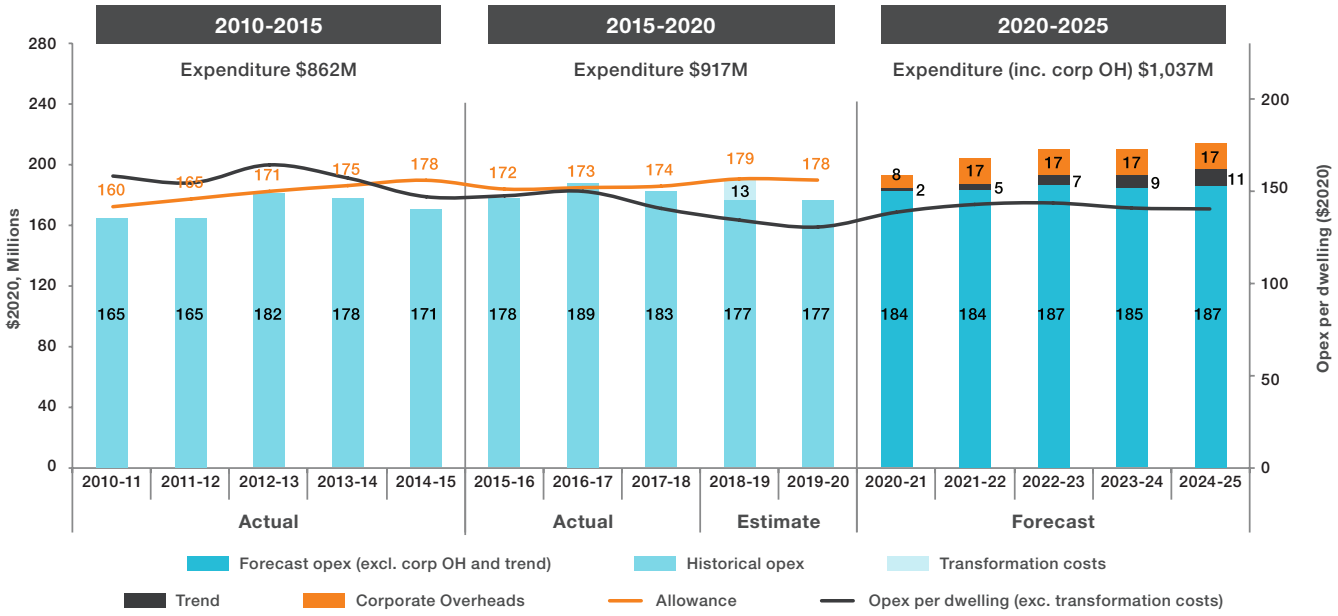
- we are forecasting an increase in wages of approximately 1.04% per annum above inflation- where internal labour costs are benchmarked to account for around 60% of operating costs. This will increase our operating expenditure by $15M.
- recognising that our customers expect us to strive continually to lower our costs and operate efficiently, we have commenced a transformation program that aims to partially offset the impacts of the above increases, and deliver sustainable operating cost reductions over the longer-term. Our transformation program will lower our operating expenditure by $39M in the 2020 Plan period, and each regulatory period thereafter (see section 6.4).
- we have also factored an ongoing productivity target into our forecasts, which will lower our operating expenditure by $19M over five years (see section 6.4).

Although our total operating costs will increase over the 2020-25 period, we expect that our operating costs per dwelling will remain in line with the 2015-20 period (see Figure 6.3). This is due to the significant growth of our network since 2014.

Changes since our Draft 2020 Plan

Since we published our Draft 2020 Plan, we have updated our operating expenditure forecast to reflect new information. The changes have increased our forecast operating expenditure by $40M. This increase has been offset by reductions in other building block items, which means that our total revenue requirement (discussed in Section 7) is closely aligned to the Draft 2020 Plan. More detail on the reasons for the increase in our operating costs is included within Attachment 6.1.

Figure 6.3 Actual and forecast operating expenditure from 2010-11 to 2024-25 (excluding debt raising costs)



Notes: (1) all operating expenditure is reported excluding debt raising costs. (2) From 1 July 2020, we are proposing that newly constructed apartment buildings with a centralised hot water system will only be able to connect through a single boundary meter. This means a single connection will supply on average about 88 units. This significantly reduces how many connections we make for each high-rise dwelling. To present data on a consistent basis over the 2011-25 period, we have used a opex per dwelling rather than opex per customer metric (see section 4.3 for details).

Changing treatment of our corporate overheads and pigging costs

Our 2020 Plan includes a proposal to change the way we treat our corporate overheads and pigging costs. We previously categorised these costs as capital expenditure, and recovered the expenditure over the long life of network assets. We are now proposing that these costs be treated as operating expenditure.

We have undertaken an assessment of the way we treat our corporate overheads, and identified that the nature of these expenses is changing. In particular the timeframe that the expenditure covers is becoming shorter, and less capital in nature. For example, in the past we used to purchase long-life IT systems, but now we are moving to cloud-based solutions that are subscription fee based. Given these changes, we consider that there is greater alignment by expensing, rather than capitalising, these corporate overheads. This change in classification will impact both our statutory and regulatory accounting records, and will also apply to our Jemena Electricity Network (JEN) in Victoria.

The change in treatment will come into effect on 1 January 2021, to allow us time to implement the required changes to our enterprise reporting system and update relevant internal processes and procedures in readiness for the change. This change increases operating expenditure by $8M in 2020-21, and by $17M per annum thereafter.

In our 2020 Plan, we are also proposing to classify intelligent pigging costs as operating expenditure (for an explanation of pigging, see section 5.4) as this activity does not result in an extension to the pipeline asset life. We believe that this classification of intelligent pigging costs as operating expenditure more accurately reflects the nature of these activities. Intelligent pigging costs will increase our forecast operating expenditure by approximately $8M over the 2020 Plan period.

The increases in operating expenditure resulting from the change in treatment of corporate overheads and intelligent pigging costs are offset by equal reductions in capital expenditure, so they do not reflect any change in our overall costs or efficiency.

In its submission on our Draft 2020 Plan, the ECA queried whether the change in treatment of these costs was in the long term interests of consumers given current concerns about affordability, and the impact it will have on bills in the short term. We believe that the answer to the question of promoting long term interests is “yes”.

We recognise that changing the treatment of these costs places upwards pressure on customers’ bills in the short term. However, the additional operating expenditure is offset by our program to deliver operating cost efficiencies (see section 6.4). Additionally, as this change reduces our capital expenditure, it will result in a lower asset base which will lead to lower overall bills for our customers over the long term. This is because we do not earn a return on operating expenditure. This approach is consistent with our strategic initiative to balance customer outcomes now and into the future, and is also consistent with the feedback we heard from customers around fairness, in the short and long term.

Testing meters in the lab

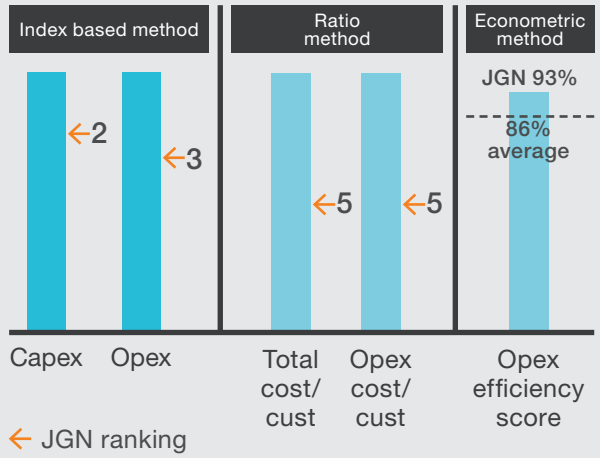
6.4 Delivering operating cost efficiencies

Benchmarking shows that we are operating efficiently

When compared to other gas utilities in Australia, we have consistently benchmarked well in terms of the cost and efficiency of the services we provide. According to the most recent report produced for us by Economic Insights, we continue to benchmark well against our peers in relation to operating expenditure, capital expenditure and our total costs.

Figure 6.4 Our benchmarking performance

We have consistently benchmarked well according to the latest Economic Insights gas benchmarking study.



Economic Insights uses three broad methods to benchmark businesses:

- **Index based method:** this compares annual productivity levels of businesses' operating and capital expenditure.
- **Ratio method:** this measures businesses' average operating and capital cost performance over a five year period on individual cost drivers.
- **Econometric method:** this assesses businesses' average operating expenditure efficiency over a historical period and estimates an industry wide productivity improvement.

Transforming our business to reduce our cost base

To ensure that gas remains a competitive and sustainable fuel both now and into the future, we must strive continually to improve our cost efficiency.

We are currently implementing a business-wide transformation program, which aims to reduce our operating-cost base so that we can achieve sustainable operating-cost reductions over the longer term. The program demonstrates our commitment to continuous improvement in operational efficiency, and will assist us in reducing network charges for our customers over the 2020-25 period.

This program commenced in 2018, and will deliver benefits of approximately $8M per annum. The cost reductions achieved through this program will be well in excess of the implementation costs of approximately $13M.

We believe that these benefits should be incorporated into our base year (2018-19) for the purpose of forecasting our operating expenditure requirements over the five year 2020 Plan period.

We are also proposing that a positive operating cost efficiency carryover amount is included in our 2020 Plan (see section 7.5).

Our ongoing commitment to deliver operating cost efficiencies

Recognising that there are always opportunities for further improvements in efficiency, our 2020 Plan commits us to making a 0.74% per annum saving in our operating costs over the 2020-25 period. This translates into savings of approximately $19M over five years. This is good for our customers, as these efficiency benefits will translate as lower prices. This means that we, not customers, will bear the costs and risks of these initiatives.

Jemena field staff

6.5 How our operating expenditure program will benefit our customers

Our operating expenditure proposal for the 2020-25 period represents an efficient level of expenditure required to deliver the safe, reliable and cost-effective gas services that our customers have told us they want. It will enable us to continue to:

- deliver safe, reliable and cost-effective services through investment in maintenance programs that manage risk and meet customer service requirements
- respond to emergencies so that we minimise supply disruptions
- operate our call centres and customer touch points
- market gas for the continued utilisation of our network
- manage Jemena as a corporate entity and regulated business, to meet our legal and regulatory obligations
- replenish efficient levels of UAG

6.6 More information on our operating expenditure requirements

More detailed information on our historical and forecast operating expenditure requirements is contained within Attachments 6.1 to 6.11.

07

The revenue we require to **deliver** our 2020 Plan

7.1 Our forecast costs

To run our business effectively, we need to generate enough revenue to recover the following costs over the 2020-25 period:

- forecast operating costs
- return on capital—interest and other costs related to our 'borrowings' for our debt and equity for past and forecast capital expenditure
- the forecast depreciation on our assets—the amount we need to recover over this period so that we will recover our capital costs over the expected lifetime of each asset
- forecast tax costs—to pay our tax liabilities over the period
- forecast incentive scheme related revenue adjustments.

We recover these costs from our customers by adding up our 'building block costs', using an approach specified in the gas regulatory framework (see Figure 7.1). These building block costs form the basis of the revenue which is approved by the AER and earned from our customers through network tariffs. More information on each of these building blocks is contained in sections 7.2 to 7.7.

Our 2020 Plan also includes an adjustment to our 2020-25 proposed revenues, to return approximately $169M of revenue earnt over the 2016-20 period.

This hand back of revenue is required due to revisions to our 2015-20 Plan which were finalised by the AER in February 2019. To aid transparency, bill impacts are shown with and without the impacts of this 'over recovery handed back' (see section 7.7 for more details).

Our 2020 Plan building block costs, together with the projected price path to deliver the required revenue, are shown in Table 7.1 and Figure 7.2.

Due to the growth in customers connecting to our network and our actions to deliver sustainable cost reductions, the average revenue we require per dwelling to deliver our plan will fall by 10%, from $331 in the 2015-20 period to $299 in the 2020-25 period (see Figure 7.3). This is good for our customers, as these reductions lower network prices.

To deliver our 2020 Plan, we are seeking $2,360M in revenue. Once we take into account the revenue handback (see section 7.7 for details), our building block costs reduce to $2,191M, and our costs per customer will drop further to $277. This represents a minor increase to the revenue in our Draft 2020 Plan.

The price path shown in Table 7.1 delivers on preferences expressed by our customers (see section 4.4 for more details).

Figure 7.1 Building block costs

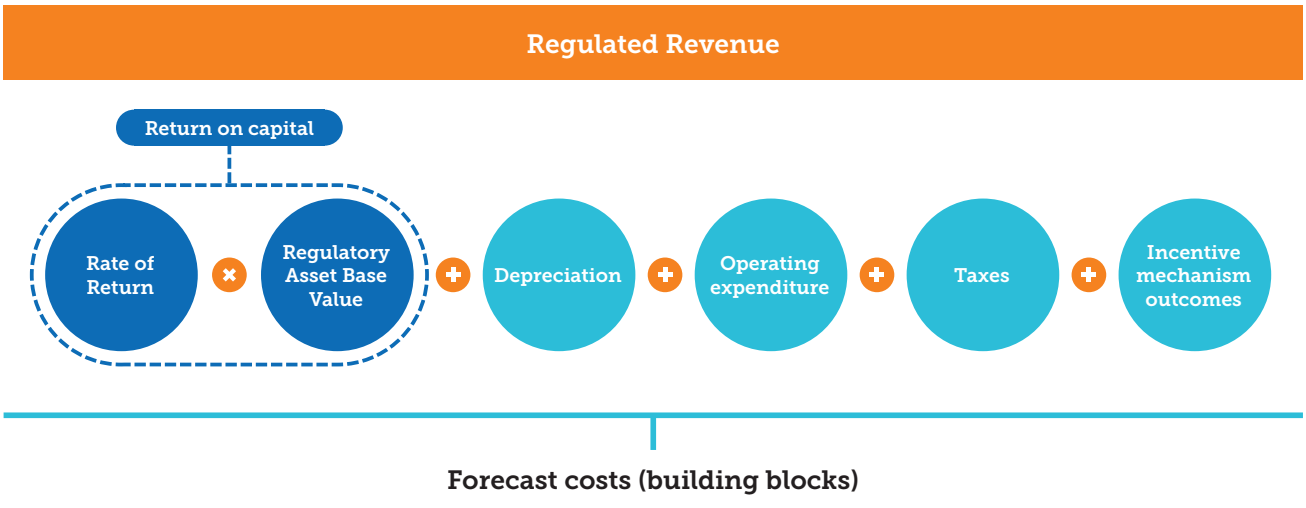
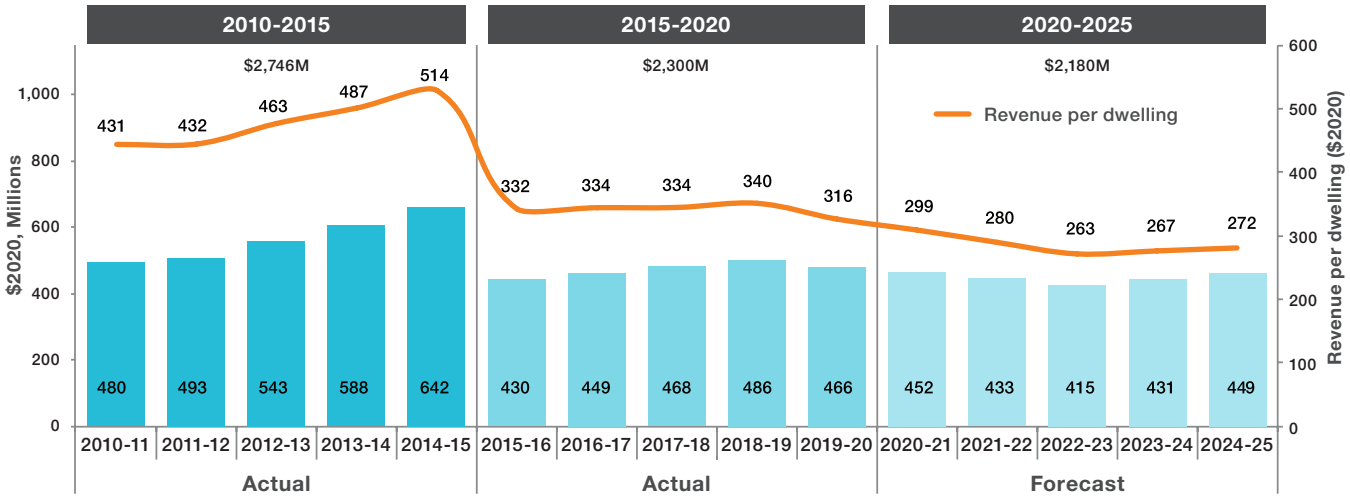


Table 7.1 Revenue and price build-up from building block elements ($2020, $M)

	2020-21	2021-22	2022-23	2023-24	2024-25	Total
Return on capital	162	165	166	167	166	826
Depreciation (return of capital)	69	78	85	94	84	410
Operating expenditure	196	207	213	213	217	1,046
Incentive schemes	9	7	20	13	13	62
Net tax allowance	3	3	4	4	3	16
Building block revenue requirement (excluding revenue adjustment)	439	460	487	491	483	2,360
Revenue adjustment	(169)	-	-	-	-	(169)
Annual revenue requirement (including revenue adjustment)	270	460	487	491	483	2,191
Smoothed revenue requirement	452	433	415	431	449	2,180
Price path (in real terms) (including revenue adjustment)	13.28%	5.00%	5.00%	-3.35%	-3.35%	

Notes: In 2020-25, we will return approximately $169M of revenue we received from customers in the current period. This hand back will be made by adjusting our 2020-21 (unsmoothed) revenue (see section 7.7 for details).

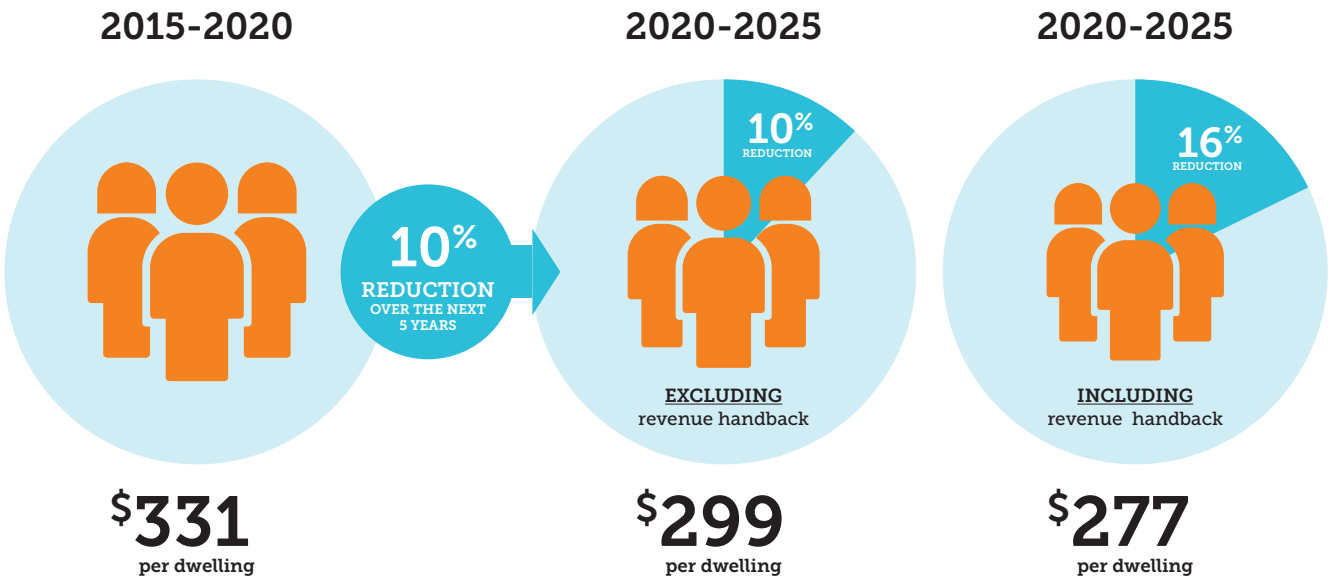
Figure 7.2 Our revenue requirements over the 2010 to 2025 period (smoothed)



The revenue that we require to deliver our 2020 Plan is $7M higher than the revenue we forecast in our Draft 2020 Plan. There are three key (but offsetting) drivers for the change in our forecast:

- a reduction in the return on capital of $42M, driven by reductions in the rate of return and tax building blocks
- an additional $40M in our forecast operating costs, which is due to an expected increase in UAG costs ($32M) and additional base year expenditure
- revenue due to the operating expenditure incentive scheme has also increased by $8M, to account for updated information.

Figure 7.3 Average annual revenue per customer for 2020-25 compared with 2015-20 ($2020, Millions)



Customers engaged on issues such as recovering our costs

7.2 Return on capital

The return on capital, or the cost of financing investment in the network, is the second largest of our building-block costs.

Financing costs vary with interest rates and our regulatory asset base (RAB)—this is the value of all the assets we use in providing our reference service. It represents the as-yet-unrecovered capital investments we have made in the past to provide services to our customers.

We estimate that the value of our asset base at the start of the 2020-25 period will be $3.35B, and that it will increase by 2.7%, to $3.44B by the end the period. This increase is principally due to the capital expenditure required to connect approximately 130,000 new customers to our network, and to ensure ongoing reliable, safe and secure supply to our customers.

Figure 7.4 How the regulatory asset base is calculated

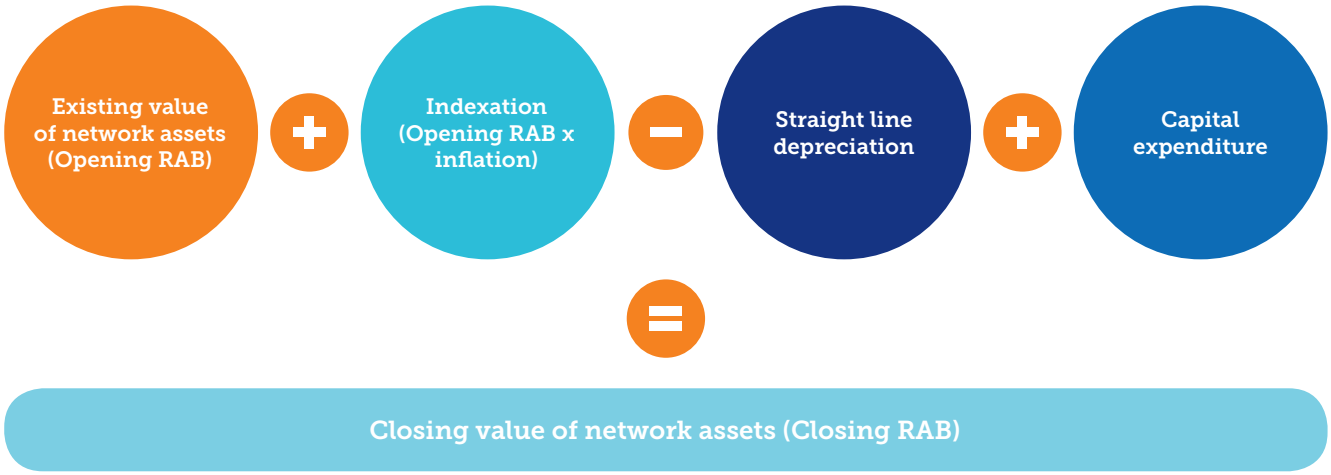
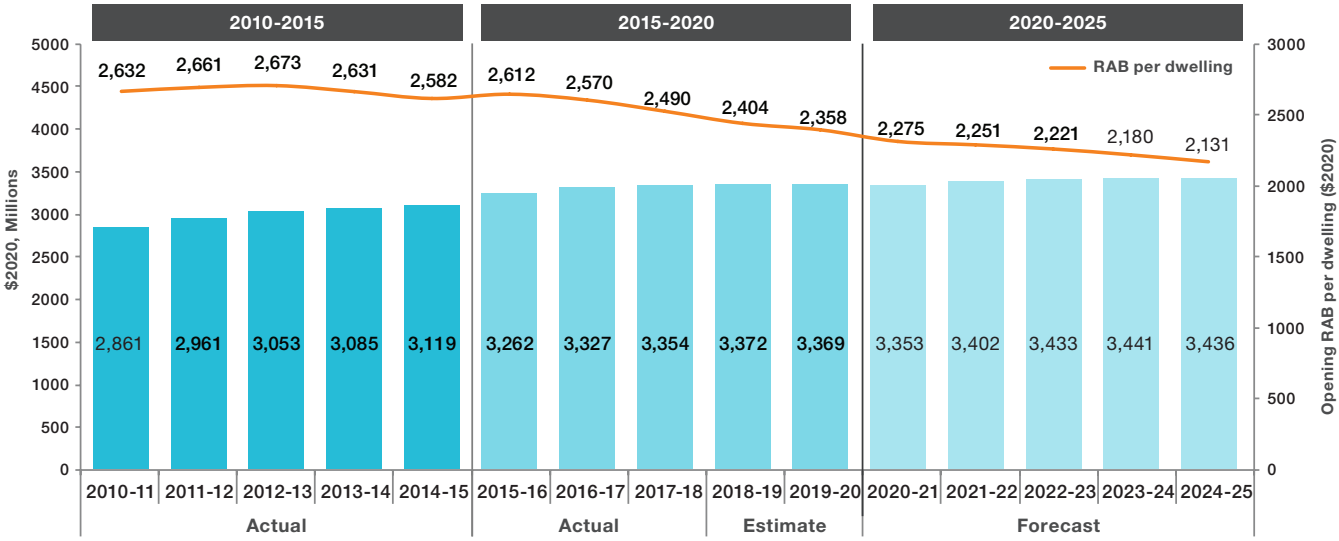


Figure 7.5 Changes in our RAB from 2010-11 to 2024-25



Although we expect our RAB to increase, due to the growth in customer numbers we expect that the RAB per customer will decrease over 2016-25 by approximately 2.2% per annum. In fact, over the 2016-25 period, we expect that real RAB per customer will decrease from $2,612 to $2,131, which is a reduction of more than 18%. A lower RAB per customer is in the long-term interests of customers as it will lead to lower network bills.

The RAB is multiplied by the rate of return (or the weighted average cost of capital) to arrive at the return-on-capital building block. It is based on a weighted average of estimated debt and equity costs.

The rate of return represents the return our shareholders make in funding investments in new assets. It must be balanced to achieve the competing goals of keeping prices affordable while still making it attractive for investors to fund expenditure to maintain a safe and reliable network.

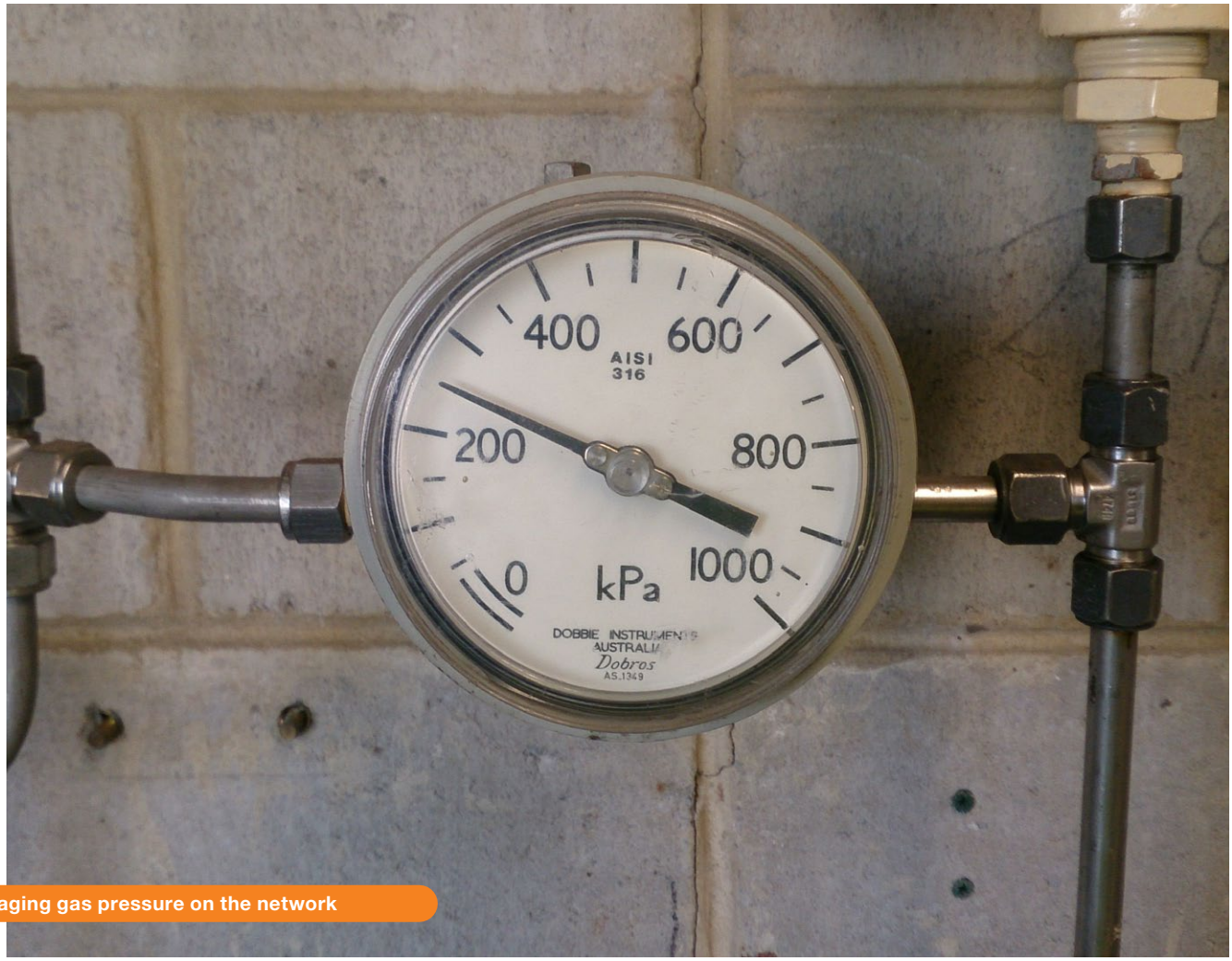
In December 2018, the AER published its rate of return instrument which is binding on network businesses. Our 2020 Plan adopts this instrument.

Our placeholder calculation of the rate of return for our 2020 Plan period is shown in Table 7.2. The rate of return is lower than our Draft 2020 Plan, which is due to a lower return on equity, driven by updated market data.

Table 7.2 Our placeholder rate of return

Parameter	Proposal
Return on equity	5.62%
Return on debt	4.52%
Inflation	2.42%
Leverage	60%
Gamma	58.50%
Corporate tax rate	30%
Nominal Vanilla WACC	**4.96%**

Note: This rate of return will be updated by the AER based on the actual averaging period for JGN at the time of final decision



Managing gas pressure on the network

7.3 Depreciation (return of capital) and asset lives

Depreciation, or the return of capital, returns the capital investments that we make over the expected useful life of the assets. It is returned to our investors to enable them to fund the purchase of new replacement assets.

We have calculated depreciation using an approach that is consistent with the National Gas Rules and the AER's method.[10]

Our proposal to change asset lives for new investment

As discussed in section 3, the Australian energy market is undergoing a period of unprecedented change. While natural gas has historically been promoted as the low-carbon energy option, the change in the energy market means that the future of natural gas is no longer assured.

Although we are investing in innovative technology in an effort to secure the future of our gas network beyond 2050, success is by no means certain—it is possible that our network will no longer be viable beyond 2050. Should this happen, we are likely to see customers disconnect from our network in great numbers, meaning that there will be fewer customers over which to spread our largely fixed costs. The customers remaining on the network at this time are likely to be those who are constrained in their ability to switch technologies. This may be due to cost constraints or for practical reasons. This raises an issue of fairness, as those customers who are less able to afford price increases would have price increases imposed on them with little capacity to respond.

Should this occur, it is unlikely that we would be able to recover all of the investments we have made in our network. This is because these investments are recovered over a long period. Such an outcome would be contrary to the objectives and principles of the regulatory framework, which seek to provide businesses with a reasonable expectation that they will recover their investment costs.

Over the past few years we have been thinking carefully about how we should respond to mitigate this risk. As outlined in section 3, we have already commenced a number of initiatives which seek to ensure the future of gas in a low carbon future.

In relation to the new investments that we will make on our network from 1 July 2020, we strongly believe that the best approach is to speed up cost recovery for new investments we make in the network by adjusting the standard asset lives we apply to these assets. Our approach is consistent with the policy objective for depreciation, and economic regulation more broadly. This is because the proposed approach maintains a high degree of confidence that these investments will be recovered over their economic life. In addition, as the return on capital allowance does not allow gas distribution companies to earn a higher return despite this risk, we think that it is appropriate to look at other ways, such as the change in asset lives, to recover our costs with more certainty.

10 We have used the AER's latest PTRM model, but our own Roll-Forward model. We have determined the depreciation for each asset class by applying the real straight-line depreciation method. We are proposing to change our approach to calculating depreciation from a weighted average remaining life, to a year-on-year tracking method. This will ensure that our proposed changes to asset lives for new investments can be separately tracked from existing assets.

Table 7.3 details the proposed changes to asset lives that we are currently considering for new investment. The revenue impact of changing the asset lives is $22M in the 2020-25 period, but it will reduce growth in the RAB, which will place a downward pressure on prices in the long-term.

Table 7.3 Proposed changes to asset lives for new investments

Asset Class	Current standard lives (years)	Proposed standard lives for new investment (years)	Percentage of capital expenditure in asset class compared to capital program as a whole
Trunks	80	50	0%
High pressure mains	80	50	13%
Meters/meter reading devices	20	15	21%
Medium pressure mains	50	30	15%
Medium pressure services	50	30	32%

As noted above, we are proposing that this change only applies to new investments from 1 July 2020. This means that we will bear the risk that we will not recover the full cost of investments made before 30 June 2020. We believe that this approach strikes a fair balance between the impacts on our existing and future customers, and is consistent with feedback we received on the key theme of fairness.

While this change in asset lives does increase our revenue requirement in the 2020-25 period, it will not change the amount of money that we are allowed to recover—under the regulatory framework we are only allowed to cover the cost of our investments once. Changing the asset lives for new investment only speeds up the time over which we recover the cost of our investments.

What we heard from customers

Given the importance of this issue, and its impact on our revenue requirements in the 2020 Plan period, we consulted with our customers on this proposal. We sought to understand whether they would support our proposal to speed up the recovery of our investments in new medium pressure mains and services assets.

We presented our customers with two options around how we recover our costs – either maintain our current asset lives or to speed up the recovery of some new categories of investment that we make by shortening asset lives.

Consistent with how we tested our future investment approach (see section 5.3), we explored these options under two different scenarios, so that customers had a view of the price impacts should the gas network either decline or thrive beyond 2050.

Most customers voted in favour of a change to the asset lives. Customers told us that they want us to take a proactive approach to managing future uncertainty and to minimise any negative customer consequences. They saw this as a way for current customers to do a little bit now to protect future generations from much more significant price implications. Even though our customers are optimistic about the future of gas this approach was considered appropriate, as it also pays off the asset sooner reducing future bills if the asset thrives. Customers also preferred this approach as something that could be revisited as the future becomes clearer without impacting service quality or reliability. They saw that changing the recovery period for new, medium pressure mains and services assets was also a low risk or ‘no regrets’ approach.

We tested this proposal with customers at the same time we asked them about whether we should change our approach to investing in the network (see section 5.3). Customers recognised the link and felt most comfortable when faster recovery of our costs, and a long-term investment approach were paired together. While customers also had the opportunity to change their voting when the combined bill impacts of these two strategies were presented, very few customers changed their view.

Table 7.4 summarises the results of the voting by customers at our deliberative forums. This shows the results after the final round of voting.

We also tested this proposal with customers at our CALD engagement where all of the group voted in support (11 in total). Additionally, at the over-55s forum, the majority of our customers agreed with the proposal.

Table 7.4 Customer support for change in asset lives at deliberative forums

	Goulburn	Griffith	Western Sydney	Bathurst	Newcastle	Total
Voted for the change in asset lives	12	7	14	15	17	65 (81%)
Voted against the change in asset lives	4	4	3	3	1	15 (19%)

We met with our customers again after we published our Draft 2020 Plan. The purpose of these sessions was to understand whether we had correctly incorporated the feedback and preferences of our customers into our Draft 2020 Plan. We outlined how we had responded to feedback on the key theme of fairness, highlighting that we had incorporated our proposal to the change the asset lives into our plans. We then asked our customers to vote on how well we had responded to their feedback. A significant majority (78%) of customers considered that we had responded very well or quite well to their feedback on the key theme of fairness. Additionally, 90% of our customers strongly or moderately agreed that our Draft 2020 Plan was in their long term interests. Given this positive response from our customers, we have not changed the approach we set out in our Draft 2020 Plan.

We also received written submissions on our Draft 2020 Plan from PIAC and the ECA on our proposal to change asset lives for new investment. The ECA indicated that it wanted to see more evidence that our network will no longer be viable beyond 2050. In contrast, PIAC agreed that there is a significant risk that our network won't be viable beyond 2050, but it indicated that it wanted us to consider options outside of the current regulatory framework to deal with this issue so that customers do not have to pay in the shorter term. We have sought to address the issues raised by PIAC and the ECA, and provide more detail on our proposal to change asset lives, in Attachment 7.10.

Accelerated depreciation of existing high pressure in line inspections

As part of our 2020 Plan, we are also proposing to accelerate depreciation of high pressure pipeline inspections which are currently included in our regulated asset base. These inspections, which are undertaken by intelligent 'pigs' (see section 5.4 for more details), date back to 2014 and currently have a 72 year remaining asset life.

Consistent with the Australian Standard for Operations and Maintenance of gas pipelines (AS2885), we inspect our high pressure pipelines every 10 years. We believe that accelerating the depreciation of these assets, so that they are fully depreciated by 2024-25 will better reflect the usage of these assets. This approach is also consistent with our proposal to classify any future costs of inline inspections—pigging costs—as operating expenditure.

While this proposal will increase our depreciation building block in the short term, it is consistent with our strategy to ensure the long term price competitiveness of gas by reducing real RAB growth. The revenue impact of this proposal over the 2020-25 period is $15M.

Table 7.5 Proposed changes to asset lives for existing high pressure pipeline inspections

Asset Class	Current remaining lives (years)	Proposed remaining lives (years)
Existing high pressure pipeline inspection	72	5

7.4 Operating expenditure

Operating expenditure is a significant part of our building block revenue. We have provided an outline of how we forecast it in Chapter 6.

7.5 Incentive scheme arrangements

The regulatory framework incentivises us to find more efficient ways of delivering our services, which ultimately benefits customers in the form of lower bills. Incentive schemes give us temporary 'rewards'—increases in revenue—for performing well, and penalties—reductions in revenue—if we don't. The schemes are designed to pass the benefits of improved efficiency to customers, over time.

Efficiency benefit sharing scheme

We are currently subject to an efficiency benefit sharing scheme (EBSS), also known as an efficiency carryover mechanism (ECM). The scheme provides us with a continuous incentive to identify and deliver improvements to operating expenditure efficiency. Any savings that we make are shared with our customers in a ratio of approximately 70% (customers) to 30% (Jemena).

As a result of our performance against this incentive scheme, we will either receive a reward or penalty in our revenue for the following regulatory period. In other words, our performance in the current regulatory period impacts the amount of revenue we receive in the next.

We are forecasting additional revenue of $62M over 2020-25 under this incentive scheme. This represents our share (30%) of the efficiency benefits and an adjustment for our transformation costs, explained in section 6.4.

On 8 April 2019, the AER approved a minor variation to our EBSS, to align it to the latest version of the scheme (version 2). The modification allows for one-off adjustments for efficiency gains that are not repeatable.

Capital expenditure sharing scheme

As part of the regulatory framework, we currently receive a limited incentive to reduce how much capital expenditure we invest. In the short-term, the allowance we receive for funding our investments is not adjusted for how much we actually spend. If we can lower our capital expenditure we can keep the additional funding costs. Similarly, if we spend more capital expenditure we incur the additional funding costs.

The incentive benefits consumers as it encourages us to find savings which flow through to lower bills. Incentives allow us to be rewarded when we lower costs (which funds the innovation required to realise the savings) and ensures we share part of the burden when costs increase. However, the current approach results in an uneven incentive. Over each five year period, the incentive to reduce spend is strongest in the first year but falls to approximately zero in the last year.

For electricity distribution and transmission networks, the AER applies a Capital Expenditure Sharing Scheme (CESS) to strengthen the incentive to lower capital expenditure. The scheme shares the benefits of cost savings 70-30 with consumers. The scheme also ensures that an even incentive is applied across each five year planning period and balances the incentives across capital and operating expenditure.

Recently, the AER approved a modified CESS for the Victorian gas networks. To address concerns that the scheme could encourage businesses to reduce investment at the expense of service standards, the mechanism approved by the AER takes into account material reductions in our service performance.

As part of our 2020 Plan, we are proposing a CESS, similar in design to the scheme that applies for the Victorian gas networks. We believe that this is in the long term interests of consumers as it will help us to further improve our efficiency, keeping a downward pressure on bills. This strategy also forms part of our strategic response to the uncertain future for gas.

In our Draft 2020 Plan we flagged that we would engage with stakeholders on the design of the CESS.

Over the past few months we have engaged with PIAC, ECA, the AER and CCP on the design of the CESS, including in relation to the categories of capital expenditure over which it should apply, and the service performance measures.

The CESS that we have proposed as part of our 2020 Plan takes into account the feedback we received from ECA, PIAC and the AER as part of the engagement process.

More detail on our engagement with interested stakeholders and the proposed CESS is included in Attachments 7.11 and 7.12.

The changing face of Sydney suburbs

7.6 Corporate income tax

This allowance represents what we forecast our income-tax liabilities to be over the 2020-25 period. To calculate this allowance we have used the assumptions about the value of imputation credits that are outlined in the AER's 2018 new PTRM and rate of return instrument. Additionally, we are the only business regulated by the AER that uses its preferred 'diminishing balance' approach which results in a lower tax burden on customers due to alignment between the regulatory allowance and actual tax practice.

The AER recently reviewed its regulatory tax approach. We have incorporated the outcomes from this review into our 2020 Plan. This has resulted in a minor reduction in our forecast net tax allowance (of $1M) compared to the Draft 2020 Plan.

7.7 Cross-period smoothing revenue adjustment

Following the release of the AER's Final Decision on our 2015 Plan, we appealed some aspects of the AER's decision. As a result of these proceedings, the AER's decision was set aside. Following a subsequent appeal by the AER the decision was remitted back to the AER to be remade.

Throughout 2017-18, we worked closely with the AER, the AER's Consumer Challenge Panel, and customer advocates to develop a proposal that seeks to resolve all outstanding matters on the remittal as quickly as possible, to deliver an outcome that is in the long-term interests of consumers. On 28 February 2019, the AER remade its Final Decision on our 2015 Plan.

In the absence of a Final Decision on our 2015 Plan, for the years 2016-17, 2017-18 and 2018-19, our prices were set using interim arrangements, with imperfect knowledge of the eventual outcome of the appeals and remittal process. A consequence of these interim arrangements is that our network charges for these years were higher than in the AER's recently remade decision on our 2015 Plan. This means that despite reductions in our network charges in 2017-18 and 2018-19, we expect to collect $169M in revenue above what would have occurred had the remade decision been in place from the outset of the 2015-20 period.

Noting that the remittal was only finalised in February 2019, there would only have been one year remaining in our 2015 Plan period in which to make the revenue adjustment. In order to avoid the significant price volatility this adjustment would cause, we worked closely with the Australian Energy Market Commission, the AER and consumer groups to develop a new rule in the National Gas Rules which allowed the AER to smooth the return of revenue to customers into our 2020 Plan.

The new rule enabled the AER to make an adjustment determination to our 2015 Plan building-block revenues and offset them against those in our 2020 Plan. On 20 February 2019, the AER made an adjustment determination. The adjustment determination lowers 2020 Plan revenues by $169M—we refer to this as a revenue adjustment throughout this document.

7.8 More information on the revenue we require to deliver our 2020 Plan

More information on the revenue we require to deliver our 2020 Plan is contained within Attachments 7.1 to 7.12.

08

Forecasting

new connections and gas consumption

8.1 New connections and gas demand over 2020-25

Our customer numbers and gas consumption forecast are an important component of our 2020 Plan. These forecasts influence our costs and are used to calculate prices.

8.2 Forecasting methodology

We split our customer base into two markets.

The volume market consists of residential and commercial customers who use less than 10TJs of gas per year and are generally charged on how much gas they consume. Our demand market is for our largest customers who consume more than 10TJ a year. These customers are primarily charged on how much capacity they require.

We commissioned Core Energy & Resources (Core) to prepare an independent forecast for the 2020-25 period. Core has significant experience in energy forecasting, having prepared forecasts for the Australian Energy Market Operator (AEMO) and other network businesses – including us – in the past. We selected Core as its methodology and forecasts have previously been reviewed, tested and accepted by the AER.

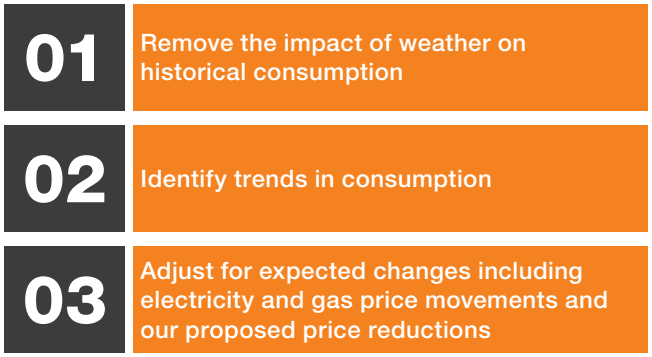
Core applies a different forecasting approach for each market. Given that we have over 1.3 million volume market customers, Core use an econometric model to forecast gas usage.

Core combined the average gas consumption forecast with a forecast of new customer numbers to come up with total usage.

To forecast customer numbers Core relies on a dwelling construction forecast developed by the Housing Industry Association (HIA). Not all dwellings will connect to our network as some households will choose not to connect to gas, while others will be outside of our network area. To reflect this, Core uses the historical ratio of connections and dwelling construction to estimate what proportion of new dwellings will connect to our network.

A different approach is applied for our larger demand market customers. Due to the smaller number of customers it is feasible to take into account known load changes for each customer. Core analysed the customers in sector groups – to differentiate between hospitals and manufacturers etc – and tested relationships between each sectors consumption with weather trends and economic activity. Where a trend was identified it was used to forecast consumption in the future.

Figure 8.1 Core's approach to forecasting average usage



8.3 Forecasts

As our network has grown and we have connected more customers total gas consumption has also increased.

Consumption on a per customer basis has steadily fallen over time. The reduction in consumption is driven by a combination of factors including energy efficiency improvements, appliance substitution, smaller dwellings and higher gas prices.

Consumption

Core has applied historical trends in consumption to forecast future changes in consumption.

Core also took into account the expected impact of retail gas and electricity price forecasts. This includes the drop in the network component of bills that we are forecasting as part of this plan – which increases forecast gas consumption.

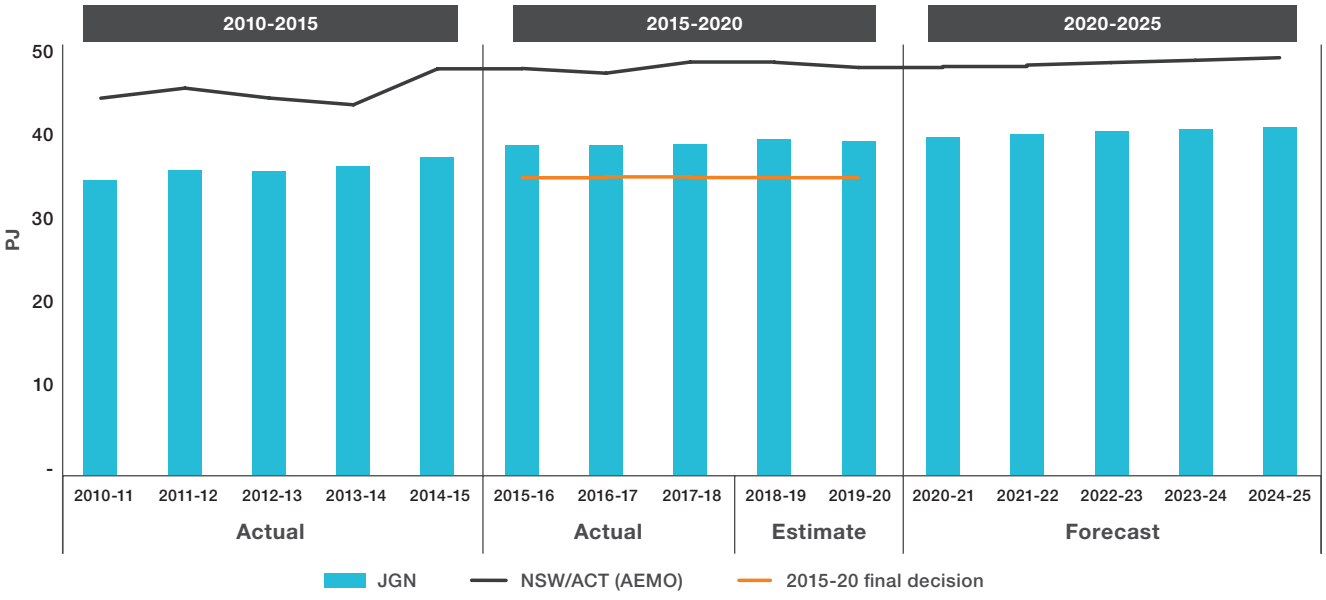
Figure 8.2 compares consumption from our network against the total consumption across the whole of NSW and the ACT reported by the Australian Energy Market Operator[11]. About 80% of the residential and commercial gas consumption in NSW and the ACT comes through our network.

The remainder comes through other networks (such as the Canberra network) which tend to be colder and have higher average consumption per customer.

As shown in Figure 8.3, the forecast for the 2015-20 period was based on the trend of falling consumption seen over the 2002-2014 period. However, we have seen average consumption hold steady before sharply dropping off. The kind of volatility we have seen (and reflected in the AEMO data) is expected as actual consumption depends on complex consumer responses to both the weather and market forces.

Core is forecasting a greater increase in consumption than AEMO over the 2020-25 period. The differences are likely due to the more granular data set Core applies.

Figure 8.2 Total volume market gas consumption (PJ)



11 While over 80% of NSW gas consumption flows through our network AEMO's forecast also includes consumption from other networks

Figure 8.3 Volume market consumption per customer (GJ)

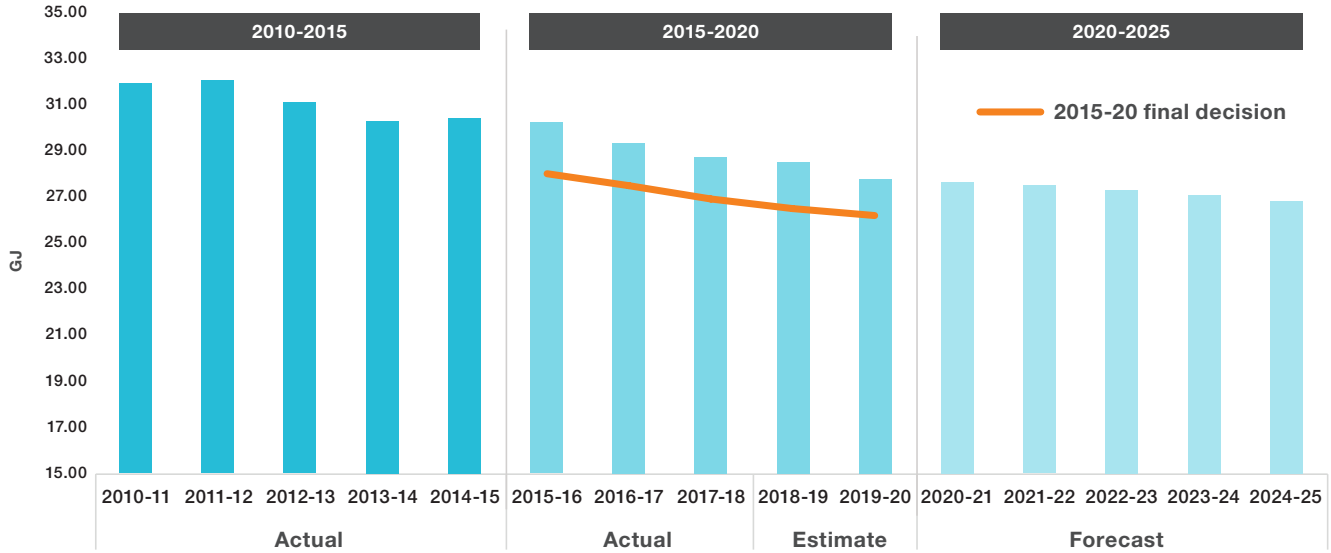
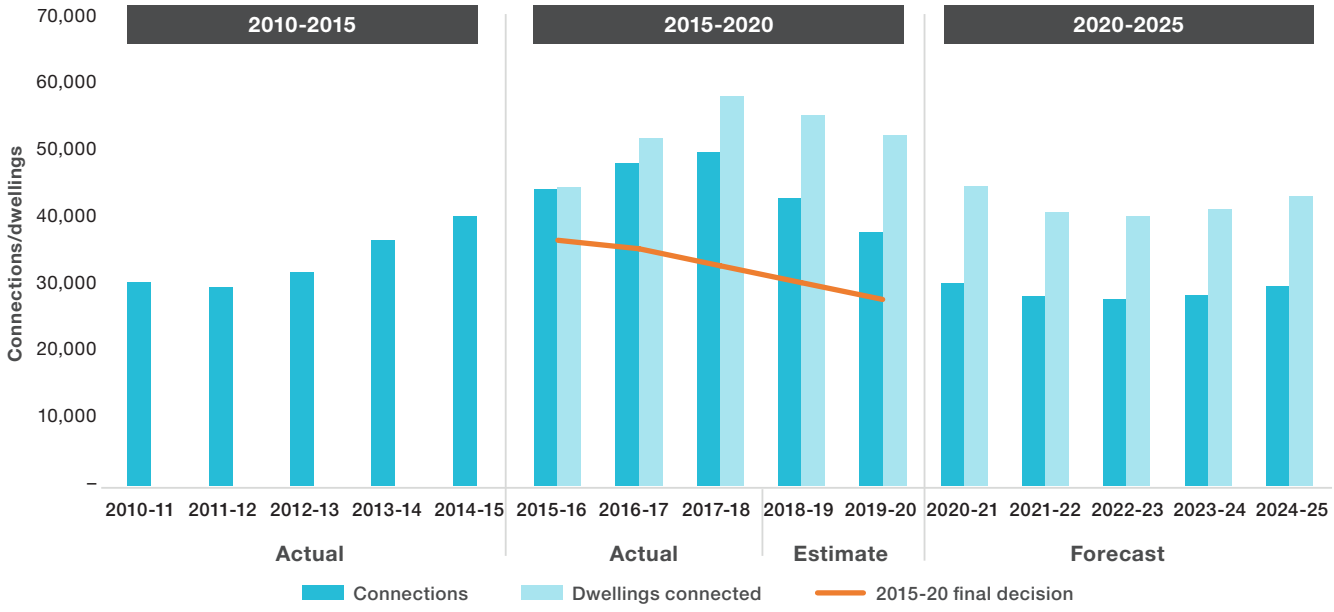


Figure 8.4 New connection and dwellings



Customer numbers

Over the last 10 years we have seen a dramatic increase in customer numbers relative to the forecast, primarily due to the unprecedented Sydney housing boom.

The boom has predominately been driven by an increase in the number of units being built, as shown in Figure 8.5.

Core is not expecting this trend to continue. Discussions with developers also indicated that apartment construction will fall. This is also reflected in the HIA dwelling forecast[12]– which Core has based its forecast on – and public commentary by other forecasters.[13]

As discussed in section 4.3, we are withdrawing our individual hot water metering product from 1 July 2020 so that new apartment buildings with centralised hot water systems will only be able to connect through a single boundary meter. This means a single connection will supply on average about 88 units. This significantly reduces how many connections we make for each high-rise dwelling resulting in a step change reduction in connection numbers. To ensure we present everything on a like-for-like basis we also report how many dwellings we connect by adding the number of units behind a volume boundary meter to the number of connections we make. Both of these forecasts are shown in Figure 8.4.

What happens if the forecast is wrong?

We use forecasts of gas consumption and customer numbers to set our prices and estimate our costs.

The actual amount of gas used and the number of customers we connect will differ.

We will not correct for any forecasting errors over the period.

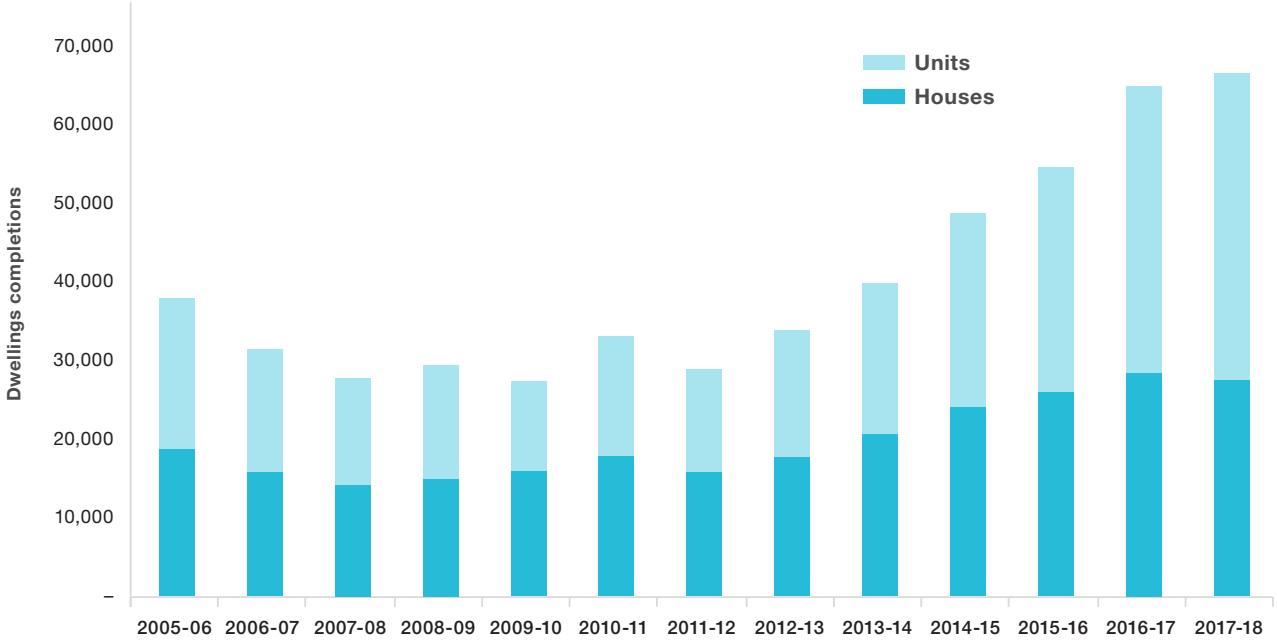
If more gas is consumed we will recover additional revenue. Similarly, if less gas is consumed we will recover less revenue.

This exposure provides us with an incentive to promote our product and be accountable for its competitiveness, just like other businesses.

It ensures we are focused on increasing the use of the network by continuing to provide a safe and reliable service and promoting its value to potential new customers.

All customers benefit from this incentive as it results in further spreading out our largely fixed costs and in turn lowering network charges.

Figure 8.5 NSW dwelling completions



Source: Australian Bureau of Statistics

12 Unfortunately, we cannot share HIA's detailed forecasts as to save on costs we haven't purchased publication rights.

13 BIS Oxford Economics are also forecasting apartment construction to fall.

8.4 More information on our new connections and gas consumption forecast

More detailed information on our forecast of new connections and gas demand over 2020-25 is contained within Attachments 8.1 to 8.3.

09
Accessing
our network

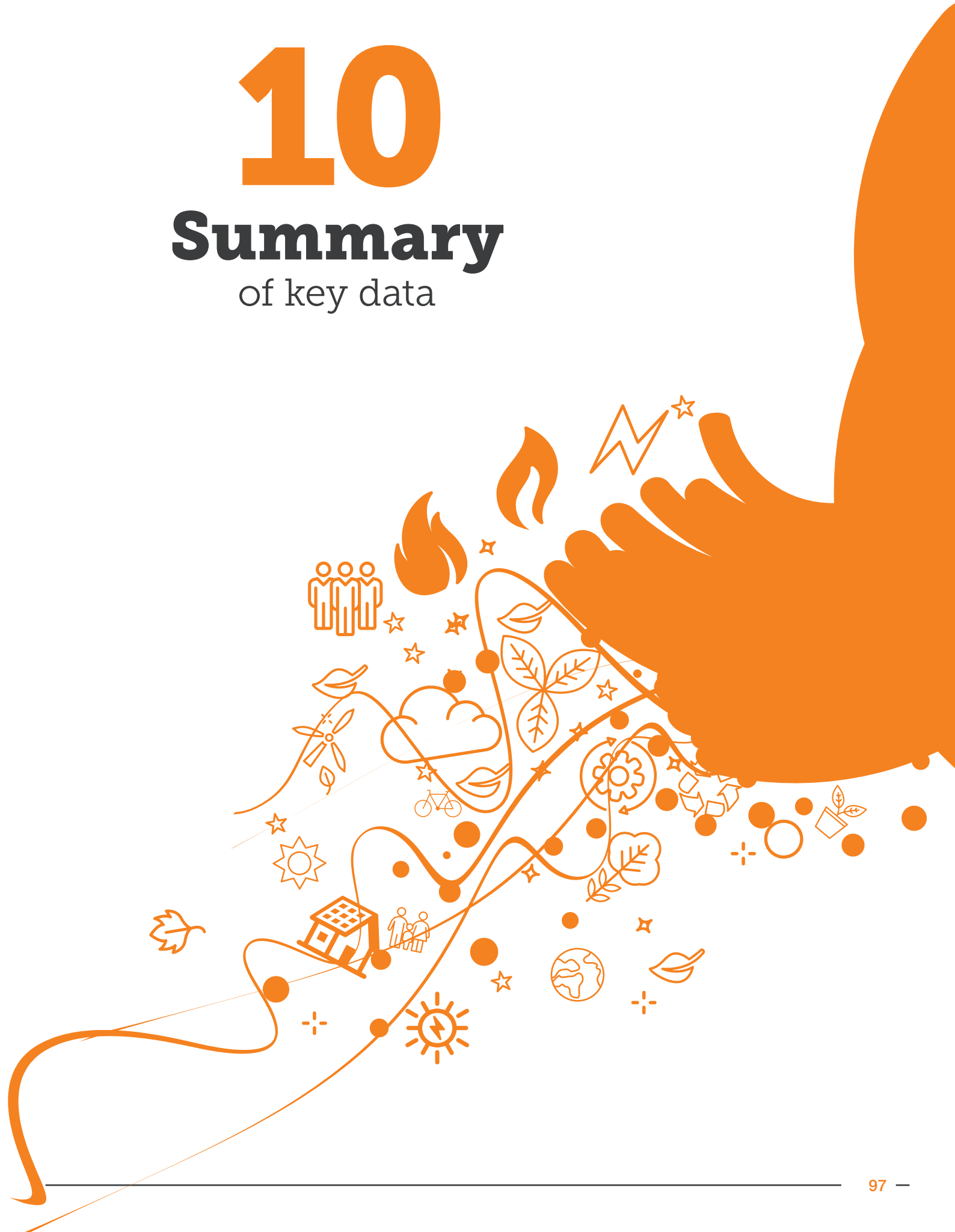
9.1 Updates to the Access Arrangement and Reference Service Agreement

The current JGN Access Arrangement (the 2015-20 Access Arrangement) is a regulatory document which sets out the framework in which JGN provides access to its reference service to users and prospective users of the JGN network.

The terms and conditions under which we provide the reference service is set out in the Reference Service Agreement (RSA), which is a schedule to the 2015-20 Access Arrangement.

The 2015-20 Access Arrangement and the RSA have undergone a number of reviews during previous access arrangement processes. While we consider that the wording and structure of the Access Arrangement and RSA has generally proven satisfactory during its application over the current 2015 Plan period, we have made further changes which are set out in detail in Attachments 9.1 and 9.2. Marked-up versions of the Access Arrangement and RSA documents are included in Attachments 9.3 and 9.4.

10 Summary of key data



10.1 Capital expenditure

($2020, $M unless stated otherwise)	2010-15					2015-20			2015-20		2020-25				
	Actual								Estimate		Forecast				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Connections															
Expenditure	67.1	76.5	87.3	100.3	105.1	100.9	119.1	133.2	124.1	114.6	93.0	84.7	84.5	85.7	89.2
Allowance	71.9	83.4	85.6	100.4	109.8	85.8	82.2	79.0	76.3	73.7	-	-	-	-	-
Connection expenditure per dwelling ($/dwelling)	2,144	2,517	2,673	2,669	2,561	2,222	2,255	2,259	2,208	2,154	2,042	2,029	2,053	2,036	2,021
Metering															
Expenditure	17.9	21.8	18.7	20.6	20.2	17.6	17.1	20.5	27.2	23.8	21.1	22.6	26.5	30.0	32.5
Allowance	27.6	26.8	29.3	29.2	32.5	37.8	39.6	40.4	39.1	36.5	-	-	-	-	-
Facilities and pipes															
Facilities expenditure	8.5	15.4	7.0	3.9	7.3	7.1	8.8	5.5	3.9	12.0	6.2	4.8	5.5	3.2	2.9
Pipes expenditure	2.5	9.5	7.1	4.2	3.5	11.2	4.9	3.6	5.2	16.0	23.0	18.7	2.4	4.5	10.6
Total facilities and pipes	11.0	24.9	14.1	8.1	10.9	18.3	13.8	9.1	9.2	28.0	29.1	23.5	7.9	7.7	13.5
Allowance	19.7	15.8	16.5	18.5	20.3	28.4	23.9	25.4	26.2	21.4	-	-	-	-	-
IT															
Expenditure	46.3	30.6	14.0	10.2	40.6	41.3	20.9	24.6	17.0	15.7	16.3	22.8	27.0	19.9	21.3
Allowance	20.4	16.5	13.5	26.0	30.1	46.6	33.4	35.9	20.1	11.6	-	-	-	-	-
Augmentation															
Expenditure	45.8	40.4	9.3	10.0	12.3	17.4	15.2	4.0	8.8	4.1	19.1	22.1	14.8	12.0	0.7
Allowance	33.6	23.7	8.8	8.1	11.2	21.9	22.2	27.8	22.1	16.0	-	-	-	-	-
Mains replacement															
Expenditure	0.1	7.0	5.7	5.9	2.3	6.3	7.5	3.8	4.0	12.0	13.6	6.8	7.6	10.8	11.7
Allowance	2.4	8.5	7.5	3.4	1.8	15.6	20.2	15.8	11.0	12.7	-	-	-	-	-
Other capex															
Expenditure	12.9	5.3	7.8	23.4	49.6	23.5	3.8	6.2	4.7	8.4	9.8	8.4	6.8	4.8	5.0
Allowance	10.4	5.3	12.0	11.9	8.1	12.0	7.6	8.0	11.1	6.6	-	-	-	-	-
Summary															
Total capex	201.1	206.5	156.9	178.5	240.9	225.3	197.3	201.3	195.0	206.6	202.1	190.9	175.0	170.9	173.9
Total allowance	186.0	179.9	173.3	197.5	213.8	248.1	229.1	232.3	205.9	178.4	-	-	-	-	-

10.2 Operating Expenditure

($2020, $M unless stated otherwise)	2010-15					2015-20			2015-20		2020-25				
	Actual								Estimate		Forecast				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Expenditure	165.4	165.4	181.6	178.2	171.2	178.2	188.7	183.2	177.3	177.3	194.2	205.3	211.0	211.1	215.0
Allowance	159.9	165.3	170.6	174.6	178.3	172.2	173.2	174.2	179.2	178.4	-	-	-	-	-
Operating expenditure per dwelling ($/dwelling)	148.7	144.9	154.9	147.5	137.1	137.7	140.1	130.6	124.1	120.3	128.5	132.9	133.7	130.9	130.4

10.3 Building block revenues

($2020, $M unless stated otherwise)	2010-15					2015-20					2020-25				
	Actual										Forecast				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Smoothed revenue	479.6	492.7	543.2	588.2	641.9	429.8	449.3	468.5	486.2	465.9	452.3	433.2	414.5	431.2	448.5
Revenue per dwelling ($/dwelling)	431.0	431.5	463.2	486.9	514.0	332.0	333.6	334.0	340.4	316.1	299.3	280.3	262.6	267.3	272.0

10.4 Regulatory Asset Base

($2020, $M unless stated otherwise)	2010-15					2015-20			2015-20		2020-25				
	Actual								Estimate		Forecast				
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Opening RAB	2,861.5	2,960.9	3,052.5	3,084.9	3,118.7	3,261.7	3,327.5	3,353.6	3,372.0	3,368.7	3,352.7	3,401.9	3,432.9	3,440.9	3,436.2
RAB per dwelling ($/dwelling)	2,632.4	2,660.6	2,673.5	2,630.6	2,581.5	2,612.0	2,570.2	2,490.3	2,403.9	2,358.1	2,275.2	2,251.1	2,221.5	2,179.6	2,130.5

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