



ACT
Government

Utility Impact Statement

Gas Transition

Environment, Planning and Sustainable Development
Directorate

1. PURPOSE

The primary purpose of this document is to outline the ACT Government's position on expected network impacts of its gas transition pathway, and to indicate government expectations that may be placed upon the ACT electricity and gas distributor, Evoenergy, particularly for the purposes of investments to be made as part of electricity network 2024-2029 (EN24) regulatory submission.

This statement focuses on the expected energy network impacts over the next 10 years. Additional information for the periods beyond this timeframe show current (2022) expected trends to assist with long-term planning and strategy. However it is acknowledged that long term projections are uncertain and will be influenced by future policies and changing market conditions.

This document does not cover network cost impacts, as Evoenergy's electricity and gas operations are subject to regulation by the Australian Energy Regulator (AER). The AER will consider and evaluate Evoenergy's submission on expected network upgrades and funding proposals to meet the Territory's stated policies and objectives.

It is anticipated that the period to 2024 will be focused on the achievement of current commitments outlined in the *Parliamentary and Governing Agreement of the 10th Legislative Assembly (PAGA)*. Additional policy settings and roll-out strategies developed within an Integrated Energy Plan, will be subject to public consultation and considered by Cabinet over the coming year.

While specific and additional policy options are not yet known, gas transition activities from 2024 will focus on a planned electrification pathway towards the ACT's legislated net zero emissions target by 2045, at the latest. A renewable gas market may also contribute to the path towards net zero emissions. Current policy commitments, incentives and programs will see a continued shift in energy delivery from a centralised energy generation and delivery model to a more decentralised electricity system with increases in rooftop solar and other distributed energy resources in the ACT. A significant increase in generation from solar photovoltaic (PV) would require alleviation of network voltage and other quality of supply issues. A decentralised system with strategies to incorporate more local distributed energy resources such as electric vehicles, battery storage and rooftop PV generation can help to stabilise and minimise the effects of energy peaks and voltage fluctuations.

2. Background

The *Climate Change and Greenhouse Gas Reduction Act 2010* sets a target for the ACT to reduce greenhouse gas emissions in the ACT to zero net emissions by 30 June 2045. The *ACT Climate Change Strategy 2019-2025* (Climate Change Strategy) sets the initial pathway for the Territory to achieve this objective. The Climate Change Strategy includes specific actions relating to the reduction of emissions from natural gas, including a commitment to develop a plan for achieving zero emissions from gas use.

In support of the Government's overarching climate change policy objectives, the PAGA includes several commitments and projects to support the phase out of fossil-fuel gas.

Natural gas use in the ACT has been steadily declining on a per connection basis for the past decade, and residential connection growth is slowing. The Government's current policy framework discourages new gas network connections and encourages a shift from gas to efficient electric appliances. Specifically, the PAGA commits the Government to legislate to prevent new gas network connections in greenfield estates and work towards a similar objective in urban infill developments.

ACT Government modelling has shown that under current policies, gas connections are expected to decline by an average of 1 per cent per year from 2023, while consumption per connection will decline by 2.5 per cent per year.

Green gas options, whether hydrogen or biogas, continue to present challenges for wide-scale uptake and replacement of the Territory's natural gas demand. Whilst research and development is still evolving in this space, it is the government's position that green gas must overcome significant cost, supply and technical barriers (particularly regarding supply for hydrogen and biogas; and with the replacement of natural gas appliances with hydrogen ready appliances that have not reached the market) that limit their current potential within the ACT. Therefore, at present the government considers that there is no credible pathway for a city wide zero emission gas distribution network.

However, green gas is a critical component in the transition to net zero emissions by 2045, requiring examination of options to reuse smaller components of the gas distribution network for niche green gas applications, and to consider the critical role for these gases for certain industrial applications. As the Government continues to develop its policy in this area, it will work with industry and stakeholders regarding possible future industrial (particularly as a feedstock and for high temperature applications) and niche applications (including possible trials in localised areas) that may be appropriate. Policy development and consultation will continue during the upcoming regulatory period. Applications to reduce the emissions intensity of residual natural gas customers through use of readily available, but limited, bio-gas resources within the ACT will continue to be explored during the current and upcoming regulatory period, as outlined in the PAGA. Australian biogas potential is limited by the availability and access to quality feedstock. In 2017, Deloitte Access Economics¹ estimated that Australian biogas potential was approximately 14 per cent of gas demand. Production above this level may compete with other high value agricultural uses of feedstock. The ACT Government will monitor the outcomes of the current GreenPower trial of a national green gas certification scheme and consider policy and consumer cost implications over this coming regulatory period.

Additional policies and incentives to encourage consumers to transition from gas to electric options may be developed over the coming year. While these actions will be designed to further reduce gas consumption and consumer connections to some degree over the five-year period from 2024-2029, gas is expected to remain an important part of the energy network for at least 10 – 15 years.

Additional research and investigation into the potential of green gases for use in industrial and commercial sectors, and sites that are technically difficult to convert will also be considered during this five-year period, to assist the development of longer-term policies.

Similar to other Government strategies, such as the Climate Change Strategy, the Government may consider options to establish gas emission reduction targets, with action plans developed, reviewed and revised on a 5-yearly basis.

The decision to pursue electrification as the preferred pathway to reduce emissions from natural gas will have an impact on both Evoenergy's gas and electricity network operations. In 2021 the ACT Government engaged GHD and ACIL Allen to provide modelling of the impact of current Climate Change policies on the ACT's energy networks. The current expected impacts on these networks are highlighted below. Unless otherwise noted, the projections within this Utility Impact Statement are based upon ACT Government modelling.

¹ Decarbonising Australia's gas distribution networks, November 2017

3. ACT Government principles

The ACT Government recognises that the policy objective to transition away from fossil gas use will present significant challenges and opportunities for Evoenergy, the ACT Government and ACT consumers.

The ACT Government remains committed to working together and in partnership with Evoenergy to understand network constraints, barriers to transition and develop future solutions and transition activities. Collaboration will be required to reduce regulatory burden where appropriate, and plan activities and policies that minimise impacts to Evoenergy and maximise benefits to the asset owners and consumers.

The ACT Government values the insights and expertise that Evoenergy can provide and will work to integrate that knowledge to develop and target future gas transition policies and incentives that will balance consumer, network and territory objectives.

While the initial Integrated Energy Plan is not expected to be released until 2023, regulatory and policy development and implementation will be ongoing and incremental through-out the entire transition period. The Government is committed to maintaining open and transparent dialogue in developing and releasing updated transition plans and policies.

4. Gas network impacts and expectations

4.1. Decline in gas customers

Under current policy settings, the number of ACT gas network connections are expected to decline by an average of 1 per cent per year from 2023. It is currently anticipated that customer departures from the gas network will accelerate from the 2036-41 regulatory cycle. The accelerated departure of customers is expected to be linked to economic drivers, due to gas network costs being shared across a smaller customer base, placing pressure on prices. Most connection departures in the next 10-years will be seen in residential properties, with single detached houses being the properties most likely to switch.

This will result in 15,000 fewer connections by 2032 and 30,000–35,000 less connections by 2045 (from 2020 connection figures).

Additional policy incentives may be implemented that aim to further increase the rate of customer disconnection, however significant changes in the disconnection rate are not expected until 2030 onwards. This is due to the capital outlay for customers to switch appliances, and it is expected that many customers will switch individual appliances over several years, rather than switch all appliances at once.

Noting the impact of rising gas prices will be felt most acutely by the lowest income Canberrans, Evoenergy should anticipate that government will seek to explore opportunities to commence transitioning public housing properties from gas connection.

4.2. Decline in gas consumption

Under current policy settings, gas consumption per connection will decline by an average of 2.5 per cent per year. This rate is slightly higher than what has been the case over the past 10 years which has been around two per cent per annum. The consumption decline is expected to be relatively steady over the period and will result in a consumption decline of approximately 60 per cent by 2045. By 2033 total consumption is expected to decline from approximately 7,000 terajoule (TJ) per year to just under 5,000 TJ. By 2045, annual consumption is expected to reduce to 3,000 TJ per annum.

The primary source of consumption decline will be from space heating appliances switching from gas to more efficient electric options (in both residential and commercial buildings). This change is expected to result in higher winter peak electricity demand requirements.

4.3. Ongoing viability of the gas network

Under current policy, the gas network is expected to remain an important energy source for the next 10-15 years and will remain economically viable until the mid-2030s. After this time the decline in customers and gas demand may put pressure on the economic viability of the network remaining in its current form.

Evoenergy will be required to work closely with stakeholders, regulators and government to develop strategies for the early identification and management of areas of the network at risk of becoming economically unviable. Early engagement with the ACT Government to manage this transition and adjustment for customers will be crucial.

4.4. Workforce changes

Evoenergy's gas network operations will need to transition from expansion, new connections and maintenance, to one that is primarily focused on maintenance, safety, abolishment and disconnection services. This will require Evoenergy to consider and implement plans for retraining its gas workforce. This would sensibly occur once new connections effectively cease, i.e. 2023.

4.5. Increase in abolishment and non-consuming meters

When a customer no-longer uses gas, they can seek to abolish (decommission) the service or close their account with the retailer. The option chosen by the customer has significantly different outcomes for the distributor, and different costs for the customer. The ACT Government would prefer customers leaving the gas network to abolish their service, avoiding ongoing costs for the distributor, that increase costs for remaining gas customers. The ACT Government understands that Evoenergy would also prefer that customers decommission their service, rather than use temporary disconnection as a permanent solution. It is noted that the current abolishment is primarily focused on the safe removal of a gas meter and the service line for demolition or construction activity, rather than for large numbers of customers electing to leaving the gas distribution network. Temporary disconnection (also known as "wadding") is intended to control consumption when there is an unresolved debt with a retailer, or premises are temporarily vacant. It is not intended for permanent disconnection.

In 2021, the AER approved Evoenergy's fee for the abolishment of a standard meter and gas service at \$670 excluding GST. Retailers pass this charge on, plus GST, with an administration fee included, resulting in consumers being charged more than \$770.00 to decommission their gas service. Many

consumers see this charge as a disincentive to abolish the service and a barrier to exit, and instead opt to close their account and pay a fee of around \$150.00, plus retailer administration fee (for a standard meter) for a temporary disconnection. Note: These prices increase by the Consumer Price Index each year. There are approximately 7,000 'non-consuming' meters which Evoenergy must maintain and recover the costs of that maintenance from other users through general network charges. Whilst the reasons for 'non-consuming' meters may vary, many are likely due to consumers wishing to avoid paying the abolishment fee.

Evoenergy is expected to receive a higher number of requests to either abolish or disconnect their service over the transition period. Unless changes are made to the way the abolishment charge is recovered, it is expected that a significant number of customers leaving the network will choose to disconnect, rather than abolish. A trend to disconnection, rather than abolishment, will have cost and maintenance implications for Evoenergy.

Evoenergy will be required to work with regulators and government to identify and propose solutions to recover charges in a manner that will encourage consumers who are permanently leaving the gas network to decommission their service, rather than temporarily disconnect.

4.6. Requirements for gas network during the transition

4.6.1. Evoenergy is required to continue to maintain the gas network in accordance with their current utility license, the *Utilities Act 2000*, the *Utilities Technical Regulation Act 2014*, and associated industry and technical codes.

- a. Evoenergy will not be required to meet connection timeframes under the *Consumer Protection Code 2020* in areas where new gas connections are prohibited.

4.6.2. In addition to current regulatory arrangements, Evoenergy will be required to:

- a. Collect and provide annual statistics to the ACT Government regarding gas abolishment requests and non-consuming meter trends across the Territory. This information will include, at a minimum:
 - i. Number of abolishments requested and completed, by suburb;
 - ii. Number of new connections, by suburb; and
 - iii. Number of 'suspended' or non-consuming meters, by suburb.
- b. Provide an annual overview of the gas network, that includes the identification of areas that are underutilised and at risk of becoming uneconomic.

It is anticipated that reporting requirements will be formalised through updates to current annual utility licence reporting requirements, legislative instruments or technical codes.

Note: It is not currently anticipated that any gas network closures would be necessary within the next 10-years. This is work that would be prioritised for later stages of the transition period but would require significant and prolonged planning and consumer signalling before it could occur.

Regulatory and policy development and implementation will be ongoing, and incremental through-out the transition period.

5. Electricity network impacts and expectations

The electricity network and entire energy system is currently undergoing a significant and sustained transition. Distribution network businesses are rapidly having to adapt and adjust operating models to account for changing consumer behaviour, usage and demand patterns, high penetration of renewables and distributed energy resources. This energy transition is happening across Australia and will continue to occur regardless of the ACT's gas transition ambitions.

From this perspective, it is important to understand that gas transition impacts will occur within a changing and evolving energy system and that it is difficult to separate gas related impacts, without considering other elements of the system.

5.1. Electricity customers and connections

The number of electricity connections are expected to continue to increase over the period. This growth in connections will be driven by population increases, greenfield development and infill developments.

It is expected that there will be growth in connection related works to cater for increases in electricity demand of existing and new customers throughout the transition period.

Much of this work is expected to be in residential areas and is due to population increases as well as the transition from gas and growth in electric vehicles. These works will typically include the installation, or replacement of, high and low voltage cables and substations with equipment of larger capacities and may also include connection upgrades to properties at the request of customers to allow for high power consuming devices. The majority of service upgrades will be single to three phase connections.

While electricity demand is expected to grow steadily over the period, under current policy settings there may be peaks in connection related works in 2024 and 2029. The level of investment in connection related works after these dates is expected to remain relatively stable, but at a rate of more than double than what was performed in 2021. This will represent a sustained and significantly higher demand in electricity connection associated works for Evoenergy than it has had in the past.

5.2. Changes to electricity demand

The electricity network will be undergoing significant change during the transition period to 2045. This is not only due to gas transition activities, but also from the impact of electric vehicles, rooftop solar PV and battery storage. It is important to acknowledge the cumulative effect these will have on network consumption and peak demand as demand changes impact network upgrade and investment requirements.

The below changes are based upon current policy settings and the achievement of current PAGA commitments. New or additional policies that may be developed under the future Integrated Energy Plan may impact on these outcomes.

- 5.2.1. Underlying annual electricity demand, being the total amount of electricity needed within the Territory, will increase and grow steadily over the period to 2045. The total growth in underlying demand will be in the vicinity of 47 per cent over the period.

- a. The increased energy required due specifically to the gas transition is expected to follow recent trends until 2023, at which point it will increase more steeply due to the introduction of measures to prevent new gas connections in infill and greenfield developments.
 - b. An additional 50 Gigawatt hours (GWh) growing to 150 GWh of energy is expected to be required between 2024 and 2029. By 2045, the additional underlying annual demand is expected to have grown by approximately 360 GWh.
- 5.2.2. Despite the underlying electricity needs growing substantially, the annual consumption from the electricity network is expected to grow by only 21 per cent (or approximately 1 per cent per year) over the same period. This is due to increased solar PV and battery uptake.
- 5.2.3. A transition from gas to electric appliances will have its most significant impact on winter peak (50POE) demand, this is due to heating being responsible for the majority of the ACT's annual gas demand. Under current policy settings, gas transition activities will lead to a sharp rise in winter 50POE of 40 Megawatt (MW) to 2025 and then steady increases to a total of 180 MW additional peak demand by 2045.
- a. The total winter peak (50POE), including electric vehicle considerations, will gradually but steadily increase from 654 MW in 2021 to 966 MW in 2045. This is an approximate 48 per cent increase. In 2024 and 2029 the projected 50POE will be approximately 680 MW and 750 MW respectively. Although rooftop solar PV will increase during this period, reduced solar generation in winter will not significantly assist in meeting peak winter demand.
 - b. Demand management strategies, distributor led non-network solutions and electricity network tariff incentives that aim to reduce individual peak demand will help to minimise network augmentation needs and cost to electricity users.
- 5.2.4. While not directly related to the gas transition, rooftop solar PV is expected to continue growing at a steady rate until 2031, at which point solar PV output is expected to grow more significantly. By 2045, 26 per cent of the underlying electricity needs are expected to be met through rooftop solar PV installations.
- a. In 2024 and 2029, rooftop solar output is expected to reach approximately 400 GWh and 550 GWh respectively. This will continue to grow to almost 1,200 GWh by 2045.
 - b. This increase in solar output and installations will have network impacts for Evoenergy, who will be required to implement strategies and install solutions to alleviate network voltage issues that can arise in areas of high-penetration of solar PV. Non-network solutions involving demand management, and tariff structures coupled with asset management strategies should directly address the need to manage increasing levels of rooftop PV generation in a way where this energy can usefully be deployed within the network and manage network voltage in accordance with relevant standards.
- 5.2.5. During the transition period, the energy use profile over the course of the day is expected to change. As solar PV uptake increases there will be a hollowing out of demand in the middle of the day. As gas heating appliances are switched to electric there will also be changes to the morning and evening peaks, particularly in winter.

These changes in daily demand profiles are expected to be incremental over the coming 10 years and more pronounced from 2033 onwards.

5.3. Increase in distributed energy resources (DER) and connection upgrades

While not specifically related to the gas transition, there are several current government policies and initiatives that will impact electricity demand and infrastructure needs over the coming years. These have the ability to both assist and hinder gas transition activities due to their impact on electricity demand and network infrastructure needs.

- 5.3.1. As noted in the demand section above, under current policy settings, rooftop solar PV output is expected to increase from 300GWh to almost 1,200GWh by 2045. The majority of this increase will be in residential installations and will be dispersed across the Territory. Solar output is expected to grow steadily to 600GWh in 2032, and then increase more sharply from 2032 to 2045. High rates of rooftop solar PV uptake will present challenges for Evoenergy in enabling DER connections and ensuring existing power supply quality requirements continue to be met.

It should be noted that this analysis does not specifically account for the sustainable household scheme uptake in rooftop solar, which may see increased installations in the early years of the transition.

- 5.3.2. Battery uptake, both behind the meter (customer owned) and on the distribution network have the capability to assist in reducing peak power demand and reduce network augmentation needs. Initiatives to install distribution network connected batteries to manage peak demand on the network will further assist the gas transition.

Under current policies, the capacity of behind the meter (home) battery systems are expected to grow steadily from 46 MWh (23 MW) to 270 MWh (135 MW) over the transition period. In 2024 home battery capacity is expected to be approximately 70 MWh (35 MW), and 120 MWh (60 MW) by 2029. The Canberra Big Battery projects will also look to add distribution scale network batteries over the coming 5 years.

- 5.3.3. The increased uptake of batteries and solar PV, as well as electric vehicles and high-draw electric appliances within residential properties, is expected to increase the number of Evoenergy's connection upgrade requests. The need to upgrade individual connections is not necessary for all connections and is somewhat reliant upon the age and location of properties. If connection upgrades are required, it is expected the majority will include an upgrade from single to 3 phase connections. Additional information will be required from Evoenergy to understand the potential scale of this work, however customer requests for connection upgrades are expected to increase in line with gas transition and EV uptake projections.

- 5.3.4. Evoenergy has advised the ACT Government that in later stages of the transition period, control systems for distributed energy resources will be required, particularly if future policies are focused towards high penetration of distributed energy resources. The need for these systems are beyond the current scope of this statement which is focused primarily on utility impacts for the upcoming electricity network regulatory submission. The government is committed to working with Evoenergy and regulators on understanding transition issues as it considers and develops future policies.

5.4. Network constraints

The increased demand needs, primarily due to population growth and infill development will place pressure on areas of the network that are already constrained, or will become

constrained during the transition period. As noted in the connections section above, the increased population and demand increases will put pressure on the low voltage network, which will require upgrades.

5.4.1. Expected constraints and investment to 2030

Currently, the most significant electricity network constraints are in the Woden/Molonglo area. Installation of a third-party battery at Molonglo is being facilitated by Evoenergy as a non-network solution to address this emerging constraint.

The Woden/Molonglo area will continue to be the area most significantly impacted by ACT population growth. The Molonglo battery station will need to be converted into a full zone substation.

A new zone substation in the Strathnairn area (to service the Ginninderry cross-border development) and the addition of extra transformer capacity at Gold Creek will be required.

5.4.2. Constraints and investment from 2030 onwards

It is anticipated that an additional new zone substation will be required in the Molonglo/Woden area to service continued growth.

Other areas of significant investment are expected to include the addition of extra transformer at East Lake and Belconnen zone substations to meet growth in the areas.

Construction of additional distribution feeders around existing zone substations including in the areas of East Lake, City East, Civic, Gold Creek Belconnen and Telopea Park are expected. These new feeders are primarily to facilitate the connection of new customers and loads and to provide transfer capacity between substations, in particular between Telopea Park and East Lake.

5.5. Workforce changes

The most significant electricity related workforce changes anticipated by the gas transition is primarily one of scale and pace of upgrade requirements. Evoenergy will continue to perform network connection, development, safety and maintenance works throughout the transition period.

It is anticipated that Evoenergy may require additional resources to plan and deliver network upgrades and technical solutions to continue to provide a safe, reliable and secure network.

5.6. Requirements for electricity network during the transition

5.6.1. Evoenergy is required to continue to maintain the electricity network in accordance with their current utility license, the *Utilities Act 2000*, the *Utilities Technical Regulation Act 2014*, and associated industry and technical codes.

5.6.2. In addition to current regulatory requirements, Evoenergy will be asked to:

- a. develop lead indicators to monitor and track system performance to predict potential problems before they have an impact
- b. report the impacts of rooftop solar PV on the network, including locations and frequency of

over-voltage events and detail proposed solutions, including non-network solutions to address areas where solar PV output curtailment is likely to be occurring.

It is anticipated that these reporting requirements will be formalised through updates to current annual utility licence reporting requirements, legislative instruments or technical codes.