Submission on the Future Gas Strategy consultation paper – November 2023

27 November 2023

Overview

The Energy Efficiency Council (EEC) welcomes the opportunity to make a submission on the Australian Government's Future Gas Strategy.

The EEC is the peak body for Australia's energy management sector. A not-for-profit membership association, the EEC works to:

- Drive world-leading policy on efficiency, electrification and demand flexibility;
- Ensure we have the skilled workforce to deliver Australia's energy transition; and
- Support businesses and households to rapidly decarbonise.

The EEC notes the Strategy's key objectives are to:

- support decarbonisation of the Australian economy;
- promote Australia's energy security and affordability;
- enhance Australia's reputation as an attractive trade and investment destination; and
- help our trade partners on their own paths to net zero.

Given these objectives, the EEC suggests the Strategy should primarily be a plan to transition Australia away from fossil gas consumption.

1 A transition to net zero requires phasing out fossil gas

As the Commonwealth has now committed Australia – in law - to a target of achieving net zero emissions by 2050, the end point of our emissions reduction trajectory is known with clarity. Australia's current emissions reduction trajectory describes a roughly linear trajectory between now and net zero by 2050:

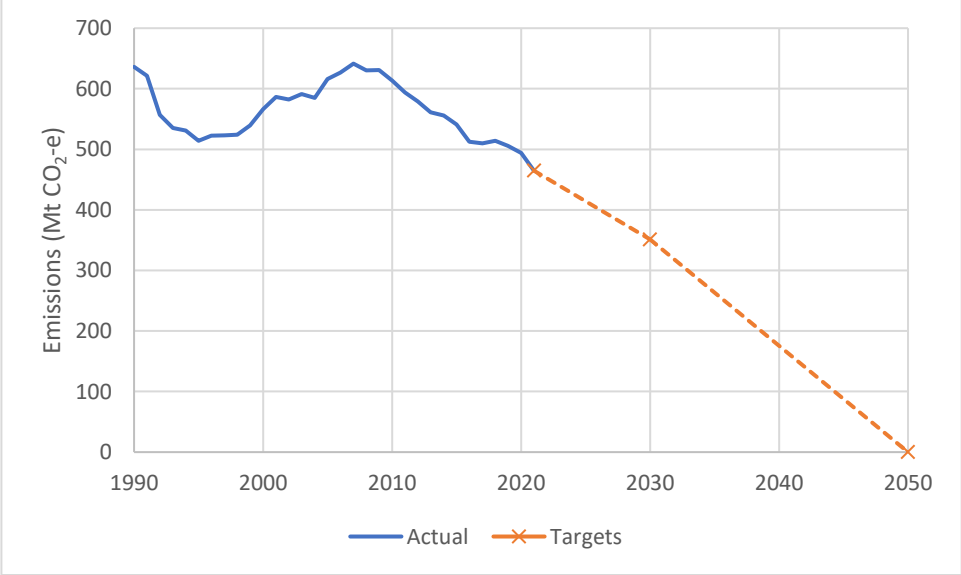


Figure 1 - Australia's emissions reduction trajectory

This is the *minimum* necessary level of ambition in addressing climate change. While it is likely that significant efforts will be required to achieve this target, realising opportunities for earlier emissions reduction will minimise the overall cumulative emissions added to the atmosphere. Reducing the total amount of

greenhouse gas we add to the atmosphere is the most critical task between now and 2050 – each additional tonne emitted makes the chance of achieving a 1.5ºC scenario more difficult – and at a certain point, impossible. To maintain the possibility of achieving 1.5ºC, Australia should seek to reduce energy-related emissions as fast as possible using every tool available at our disposal.

The implication of these circumstances is that the use of fossil gas in our energy system has a limited future and cannot extend beyond 2050 at the absolute latest. Despite decades of research and development, there is no current realistic prospect that carbon capture and storage technologies can fully abate fossil gas usage. Similarly, negative emissions such as land-based sequestration cannot be relied on to offset fossil energy use – negative emissions with high integrity are likely to be limited in scale, highly valuable, and needed for legitimately hard-to-abate industrial processes with unavoidable process emissions, or agricultural emissions that are difficult to abate.

This means that the focus of the Government's strategy should be to phase down Australia's gas usage in an orderly manner. At present, there is sufficient time to allow for proper planning and policy development to implement a phase down. However, any delay in commencing this planning work risks creating a disorderly transition away from gas later on, which will impose unnecessary costs on the Australian community.

Recommendation 1:

The Government should use the Future Gas Strategy as a place to begin planning Australia's transition away from fossil gas over the next two decades.

2 Planning for transition away from gas

Fortunately, there are concrete actions that we can undertake to begin transitioning Australia away from fossil gas. Government has a key role in coordinating this transition, providing guidance and policy certainty to householders, businesses, investors and infrastructure owners. The key strategies for transitioning away from fossil gas are **energy efficiency**, **fuel switching** and **electrification.**

There are currently a wide range of gas tasks that can be electrified using currently available technology. Residential buildings and small businesses can be electrified using induction cooktops, reverse cycle air conditioning and heat pump hot water systems. Heat pump technology is becoming applicable to a wider range of commercial tasks, and can be applied to most heating tasks at low-moderate temperatures.

Fuel-switching for processes that cannot currently be electrified will be necessary. There are currently challenges associated with scaling up renewable gases such as green hydrogen or biomethane, but continued development in this area is important to ensure that industry with higher temperature requirements can continue in the absence of fossil gas. In the interim, energy efficiency can help reduce fossil gas demand, helping to overcome predicted supply-demand gaps. In fact, the Institute for Energy Economics and Financial Analysis predicts that electrification and energy efficiency could completely eradicate the predicted gas shortfall that is expected in southern states by 2027.[1]

[1] Denis-Ryan, A, 2023, *Reducing demand – A better way to bridge the gas supply gap*, IEEFA.

There is a different pathway for different sectors to transition away from gas.

2.1 Buildings sector

Electrification paired with energy efficiency is the quickest, cheapest way to decarbonise the operations of both residential and commercial buildings.[2] Electrification relies on proven, commercially-available technology, and takes advantage of the inherent energy efficiency of electric technologies. For new buildings, building all-electric makes complete financial sense, and retrofitting existing buildings to be all-electric is increasingly attractive as gas prices rise, and occupants can take advantage of solar PV to lower their electricity bills.

Efficient, all-electric buildings are widely recognised by independent experts as the future of residential energy consumption, with alternative low-carbon technologies unlikely to be cost-effective in a timeframe that is meaningful for achieving our emissions reduction targets. Electrification that is done in an efficient, high-quality way can help reduce overall energy system costs and expedite a transition away from fossil fuels.

There are a range of roles for Government to play in ensuring that building electrification is achieved in a way that captures the broad range of benefits. These include investing in skills and training for the workers that will deliver electrification; planning and coordinating a gas network phasedown; delivering effective regulation and standards to assist consumers and building owners in making choices that save them money and reduce overall costs to the community and ensuring that vulnerable community members are not left behind in the electrification wave.

Of all the current users of fossil gas in Australia, the buildings sector is likely to be able to transition away the fastest and provide early emissions reduction opportunities. Clear policy direction from government is critical to capture these opportunities.

Recommendation 2:

The Government should encourage a rapid transition to electrification for the building sector in the Future Gas Strategy.

2.2 Commercial and light industrial use

For commercial and light industrial services, electrification is likely to be the dominant pathway. Electric technologies for many applications in this sector exist, particularly as heat pumps become applicable to higher-temperature applications. Dryers, ovens, water heaters and other low-grade heat requirements are able to be supplied through efficient electric heat pumps, with a range of commercially-available equipment able to take on these tasks.[3]

Light industrial processes (such as manufacturing) that currently use gas may be able to electrify, although conversion to processes driven by electricity may take

[2] Australian Sustainable Built Environment Council 2022, *Unlocking the pathway: Why electrification is the key to net zero buildings*, ASBEC, Sydney.
[3] Energy Efficiency Council and Australian Alliance for Energy Productivity 2023, *Harnessing heat pumps for net zero*, EEC, Melbourne

significant capital investment and technical expertise. For some niche applications, fuel-switching to a bio-fuel may be necessary.

There is a role for Government in providing advice, guidance and assistance – potentially including financial assistance – to commercial and light industrial users of gas to transition towards electrification, or biofuels if necessary.

Recommendation 3:

The Government should use the Future Gas Strategy to help identify those commercial and light industrial sectors which may currently be reliant on gas, to help plan for their eventual transition away from fossil gas.

2.3 Heavy industry

Heavy industry poses some greater challenges for transitioning away from gas, particularly in sectors such as alumina and non-ferrous metal refining and clinker production. Finding technological solutions to replacing gas use in these processes may take some time, and a focus of the Gas Strategy should be to ensure that gas remains available for these processes while a suitable replacement fuel is scaled up.

Gas also has an important use as a feedstock for chemical processes, which do not necessarily lead to greenhouse gas emissions. These processes are relatively minor users of gas in Australia, and efforts to reduce gas usage in other sectors should ensure that gas remains available for feedstock purposes.

Government should clearly signal a long-term trajectory for heavy industry to transition away from gas, and continue to support research, development and deployment of suitable alternative fuels.

Recommendation 4:

The Government should signal an ambition to decarbonise all heavy industry by 2050 and commit to a gas substitution R&D plan in its Future Gas Strategy.

2.4 Gas-powered generation

At present, gas-powered generation is relied on heavily in electricity markets as a generator of medium-last resort priority, to provide system firming and to provide insurance against unforeseen events. However, there are plenty of alternatives to fossil gas for firming in the electricity sector, many of which can provide these services at lower cost. One often overlooked firming technology is demand response. The Australian Government is starting to realise the potential benefits of demand response for managing periods of peak demand, and recently announced three virtual power plants providing dispatchable capacity totalling 95 MW will be underwritten by the Capacity Investment Scheme in NSW[4].

[4] Joint media release: Capacity Investment Scheme supports NSW to deliver 1GW of cleaner, cheaper, more reliable energy for NSW, 22 November 2023, https://minister.dcceew.gov.au/bowen/media-releases/joint-media-release-capacity-investment-scheme-supports-nsw-deliver-1gw-cleaner-cheaper-more-reliable-energy-nsw

Demand response (DR) is a relatively inexpensive way of assisting grid security compared to the cost of building generation assets that are used for only a brief period each year. DR may be used to reduce or shape demand in response to prevailing grid conditions and can be particularly valuable in abnormal or exceptional grid conditions. For example, during the NEM suspension of June 2022, entities providing demand reduction (across a range of types and arrangements) reduced peak operational demand by **630 MW**.[5]

Demand response is an important energy system asset. The International Energy Agency's Net Zero by 2050 scenario requires 500 GW of demand response being brought to market by 2030, a goal which will require significant acceleration of deployment.[6]

Demand response has a range of benefits:

- **Reduced infrastructure requirements**: Use of demand response – especially in areas of peak or critical demand[7] – can reduce the need to build new assets to serve a very small number of hours in each year. This both reduces the cost of the energy system and reduces the build pipeline for the energy transition.

- **No social licence concerns**: As demand response does not require building new infrastructure, and is an opt-in measure, there is not the same requirement to build social licence that is currently proving difficult in some existing network projects, such as the VNI West project.

- **Can be built rapidly**: As DR does not require substantial new capital, nor does it require substantial construction, it can be stood up in a matter of weeks or months, rather than years.

- **Highly effective emissions reduction:** As DR tends to be dispatched at time of high grid utilisation when the majority of the fossil fuel fleet is in operation, dispatch of demand response is highly effective at reducing energy demand at the most emissions-intensive times of grid operation.

- **Highly cost effective:** Research has demonstrated that up to 4.3 GW of potential demand response resources exist in Australia, and could be accessed for prices of between $300-1500/MWh.[8]

Barriers to unlocking more demand response

While the Capacity Investment Scheme rewards DR developers through contracts for difference that will help to de-risk projects, some DR projects may require a more guaranteed source of revenue to make them feasible.

---

[5] Australian Energy Market Operator 2022, *NEM market suspension and operational challenges in June 2022*, AEMO, Melbourne, p.20

[6] International Energy Agency 2023, 'Demand response', in *Tracking Clean Energy Progress 2023*, IEA, Paris.

[7] 'Peak demand', typically experienced in summer, is characterised by short but intense periods of operational demand, where the system is often constrained by network capacity or instaneous generation capacity. In the future, we see coming periods of 'critical demand', where instantaneous demand is lower than annual peak demand, and the system is constrained by the amount of energy available in storage – typically in winter.

[8] Energy Synapse 2022, *Demand response in the National Electricity Market*

This is partly because the operational frequency for these projects is less clear, as this type of DR plays a backup role. Large DR facilities are usually not intended to be dispatched every day but are available to support the grid where unusual demand-supply balances make reduction, shifting or shaving of demand valuable.

Given these circumstances, it's essential for DR facilities to be on standby, although dispatch might be infrequent or even absent. This mandates DR facilities to invest in accreditation under the Wholesale Demand Response Mechanism, with minimal or no compensation in return. Consequently, there's little motivation for others to enrol and contribute DR resources to the market. This scarcity of incentives leads to a limited DR capacity.

To address this, the EEC recommends the Government explores reallocating some of the designated CIS resources to establish a direct payment for DR capacity. Such payments may not necessarily be large, compared to upfront investment in generation infrastructure (or network augmentation projects) and a mechanism could be devised to reclaim a portion of this payment if the DR is actually dispatched. It is likely that by investing in adding DR capacity, there will be a net saving to the energy system overall.

Beyond the Capacity Investment Scheme, there is a need for a broader set of policy settings to encourage demand flexibility at a range of scales to help manage the grid on a day-to-day basis. As we move to an electricity system characterised by high levels of renewable energy, the value of energy will vary significantly across different times and places. As the EEC's 2023 report Clean Energy, Clean Demand makes clear, there are a range of ways that we can meet the nation's energy needs. Some – such as new energy infrastructure – are high cost, while others – such as energy management and flexible demand – are much lower cost. A suite of incentives to better encourage flexible and efficient demand is needed. If implemented well, flexible and efficient demand will make the task of building the clean energy system easier, quicker and cheaper.

Recommendation 5:

The Government should incentivise a wide range of firming activities in the electricity market, and create appropriate capacity mechanisms to stand up demand response as soon as possible, to reduce reliance on gas powered generation.

3 Urgently plan for an orderly gas network phasedown

To a certain extent, some transition away from gas usage is inevitable, as households and businesses react to higher gas prices and take advantage of low-cost solar PV to undertake their necessary tasks. This trend is likely to be supported by state government policies (particularly in Victoria and the ACT, and to a lesser extend in NSW) that are actively encouraging a transition away from fossil gas use.

This means it is likely that an increasing number of homes and businesses will shift off gas, meaning fewer active, paying connections on the gas network. At some point, the costs of operating the network for a small number of remaining connected households will become excessive, which could lead to a haphazard transition, or even unsafe network abandonment. Leaving a phasedown of the

gas network to chance risks a disorderly, 'death-spiral' transition, with the most vulnerable paying the highest cost.

Commonwealth, state and territory governments have a clear role in planning and coordinating electrification and a concurrent gas network phasedown. Electrification should be planned and undertaken on a suburb-by-suburb basis, with clear guidance provided to residents, suppliers and other stakeholders to manage the transition as clearly as possible.

Similarly, it is likely that some areas will need to retain gas access for a longer period – those businesses and industries which will take longer to transition away from fossil gas usage. Identifying these areas or precincts can help ensure that gas access can be maintained economically, while a broader network phase down takes place.

It is not clear that the current National Energy Law framework is fit-for-purpose to manage this transition, and an urgent review should take place to determine how the gas network phasedown can be managed in an optimal, cost-effective way.

Recommendation 6:

As part of its Future Gas Strategy, the Government should urgently begin planning for a gas network phasedown over the next two decades. This should identify where gas demand is likely to reduce most quickly, and where staged phaseouts should occur.

4 Gas exports pose challenges for our net zero transformation

Production and liquefaction of natural gas for export is a significant source of energy use and emissions in the economy. LNG plants' own usage of gas amounted to 433 PJ in 2020-21 – more than that used in all manufacturing, and around 30 per cent of the total natural gas used in Australia in that year.[9]

This means that in order for Australia to achieve net zero by 2050, the 21% of Australia's emissions currently ascribed to natural gas production and use will need to be eliminated.

It should also be noted that Australia's current gas reserves are sufficient for its own needs, with current production running at around five times domestic demand. This means that the needs of gas users with harder-to-substitute processes could be amply met from existing Australian reserves, assuming that Australia's sovereign gas assets are primarily directed towards meeting the needs of domestic consumption.

The Future Gas Strategy must encompass a plan for Australian gas exports that is consistent with achieving net zero in Australia by 2050, without reliance on technologies that remain speculative (such as carbon capture and storage or low-cost green hydrogen/ammonia), or reliance on limited negative emissions, and meets the needs of domestic consumers until they can be transitioned away from fossil gas.

[9] DCCEEW, 2022, *Australian Energy Update 2022*, Canberra.

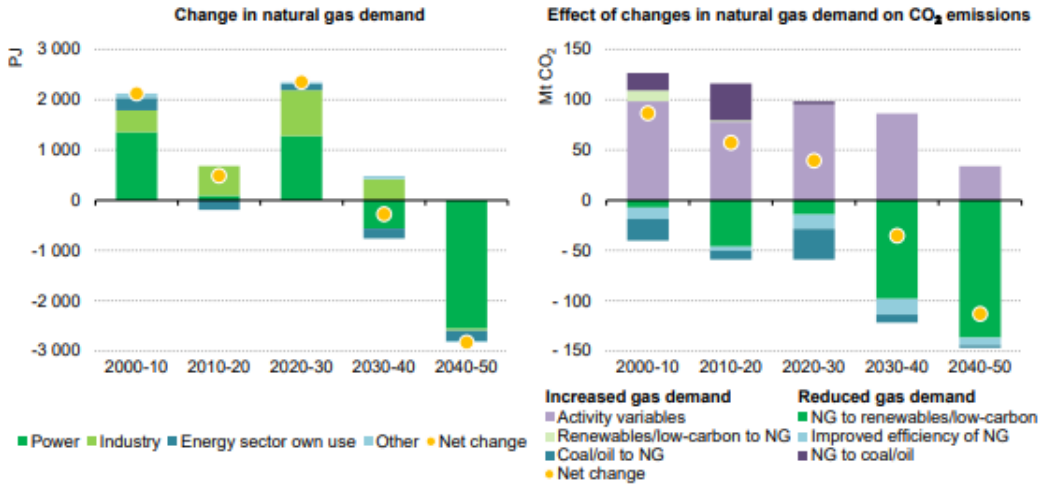
4.1 Australia should prepare for a future in which the world shifts away from gas to meet net zero by 2050

Gas production is responsible for at least one third of gas-related emissions[10]. As Australia switches from gas to electricity in households, businesses and the electricity sector, the share of GHG emissions from gas production will grow, unless action is taken to reduce gas production.

According to the latest IEA analysis, to meet net zero emissions by 2050, by 2030, all new buildings globally must be 'zero-carbon ready'[11]. This means that even in developing and emerging countries, new buildings must be all electric or use zero-emissions fossil gas substitutes. By 2050, to meet net zero emissions, IEA modelling shows that over 85% of all buildings (new and existing) must be zero carbon ready globally, implying a rapid reduction in global gas use[12].

Indeed, while the consultation paper cites the IEA's 'Announced Pledges' scenario to show that Southeast Asian demand for gas may continue to be strong until 2050, other IEA scenarios suggest a strong slowdown in gas demand in Southeast Asia, particularly after 2030 (Figure 2). For example, in the 'Sustainable Development Scenario', Southeast Asian gas demand peaks in 2035 and is 15% below 2020 levels by 2050[13].

Figure 2 Changes in natural gas demand and their effect on emissions in Southeast Asia in the Sustainable Development Scenario, 2000-2050



Note: NG = natural gas. Activity variables reflect underlying drivers of energy service demand, such as population increases or economic growth. Low-carbon and renewable forms of energy include wind, solar, geothermal, hydrogen and hydrogen-based fuels, bioenergy and electricity.

Source: IEA, 2022, Southeast Asia Energy Outlook 2022, https://iea.blob.core.windows.net/assets/e5d9b7ff-559b-4dc3-8faa-42381f80ce2e/SoutheastAsiaEnergyOutlook2022.pdf

The IEA notes that this presents a strong risk of stranded assets in Southeast Asian economies, noting that '[c]apital committed in the late 2020s may

[10] Estimated based on a combination of data from the national greenhouse gas inventories provided at https://greenhouseaccounts.climatechange.gov.au/.
[11] IEA, 2023, Net Zero by 2050: A roadmap for the Energy Sector, https://www.iea.org/reports/net-zero-by-2050
[12] Ibid.
[13] IEA, 2022, Southeast Asia Energy Outlook 2022, https://iea.blob.core.windows.net/assets/e5d9b7ff-559b-4dc3-8faa-42381f80ce2e/SoutheastAsiaEnergyOutlook2022.pdf

therefore be at risk if climate policy signals are misread, especially if long development lead times mean new projects are commissioned at a time when demand starts to fall back.'

As a nation that aspires to show leadership in addressing climate change, Australia should demonstrate that it is serious about climate change by supporting both developing and emerging economies – as well as domestic users - to shift away from fossil gas as soon as possible; and mitigate its own risks of stranded assets.

Recommendation 7:

The Government's Future Gas Strategy must demonstrate a clear plan for guiding both the Australian economy and developing and emerging nations away from a reliance on gas, and outline a plan for gas exports that achieves net zero emissions by 2050 at the latest.