

13 November 2023

Response to the Future Gas Strategy consultation paper

The Clean Energy Council welcomes the opportunity to provide input into the development of Australia's forthcoming Future Gas Strategy.

The Clean Energy Council ('the CEC') is the peak body for the renewable energy sector in Australia. We represent and work with more than 1,000 businesses operating in Australia across solar, wind and hydro power, energy storage, and renewable hydrogen.

With fossil-fuel based gas playing a significant role today in today's energy mix and exports, and its extraction and use accounting for just over one-fifth of Australia's greenhouse gas emissions, we need a clear national strategy for the systematic phasing down and phasing out of fossil-fuel gas extraction, consumption and exports.

The decarbonisation of the *electricity* sector, which accounted for a third of Australia's emissions in 2021, has now been under way for over two decades, and the increasing share of renewable energy generation capacity delivered a 27 per cent reduction in the greenhouse gas emissions of the National Electricity Market between the emissions peak in June 2009 and December 2022¹. We now have a clear national target for 82 per cent renewables by 2030 which our sector is working hard to achieve, and the Clean Energy Council considers it both achievable and necessary that the decarbonisation of the electricity sector is fully completed by 2035.

The goal of the Government's Future Gas Strategy should similarly be to chart a course for the full decarbonisation of Australia's gas sector in accordance with our international emissions reduction commitment for a 43 per cent reduction in emissions by 2030 and net zero emissions by 2050 at the latest. This strategy must also recognise that continuing global and national underperformance in emissions reductions over the coming years would bring forward the net zero deadline for stabilising warming at 1.5°C. We should therefore prepare for the need to further strengthen targets and action over time.

The goal of the Future Gas Strategy *should not be* to safeguard the role of Australia's fossil fuel-based gas industry for as long as possible in a decarbonising world. Rather it is reduce our demand and economic dependence on this energy source and industry, phase-out fossil gas extraction and replace our existing gas consumption and exports with renewable-energy based alternatives which lower our emissions, enhance productivity and support sustainable new market opportunities.

Low-cost, renewable energy paired with energy storage, will underpin the decarbonisation of the gas sector and our aspirations to develop new green energy export markets, and the Government should continue to build on its existing efforts to accelerate the deployment of solar, wind, storage and transmission. The CEC's recently released [Power Playbook](#) outlines a suite of over 45 recommendations aimed at getting Australia back on track to achieving 82 per cent renewables by 2030, and realising our superpower potential.

¹ [Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2022 \(dcceew.gov.au\)](#)

This submission addresses how we can leverage our combination of low-cost renewables, energy storage and transmission to:

1. Electrify homes and businesses and reduce domestic demand for gas
2. Reduce the role of gas-fired power generation in meeting peak electricity demand periods, and
3. Substitute the value of our liquified natural gas (LNG) sector with growing green value-added products and exports.

1. Electrification of homes and businesses can reduce domestic gas demand and deliver consumer savings

Electrification of homes, business, industry and transport, underpinned by renewable energy and storage, is a key decarbonisation strategy for the Australian economy, and should be expedited wherever possible, noting the energy productivity benefits it offers consumers.

As summarised by Energy Consumers Australia in its recent report, Stepping up: a smoother pathway to decarbonising homes, the approximately 5 million homes connected to the gas network of the existing 11 million households in Australia will need to switch their home heating and cooking from gas to electricity within ~25 years. At the same time, 15 million passenger vehicles will need to be ‘swapped’ for electric vehicles with the necessary infrastructure in place to support them.

This change will involve higher upfront costs, but will deliver substantial cost savings over the long term, as is shown in the chart below. The average all-electric household would save \$2,250 annually by 2030 when compared to a fossil-fuelled household. The savings would be substantially greater (a further \$1250) for a home with rooftop solar and a battery.

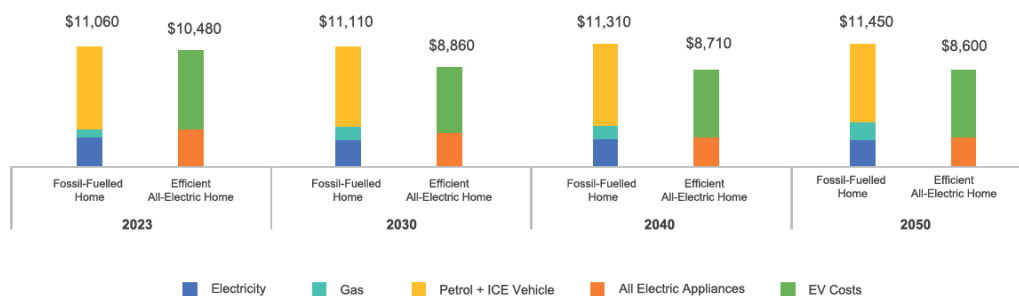


Figure 1: Total household energy spending in select years – an average fossil fuelled home compared with an efficient all-electric home (Energy Consumers Australia, 2023)

Note: Projected savings are higher for households with rooftop solar and a battery.

Fuel switching from gas and oil to direct electricity is more energy efficient and will ultimately result in lower consumer costs and greater energy productivity across the economy. And with high and volatile gas and oil prices currently being experienced – and the expectation that Australia’s east coast gas prices will remain elevated over the long term² – there is no reason for delay.

The first action by governments must be to communicate end dates for the sale of gas-based appliances and combustion vehicles. These timeframes should be set as soon as possible in alignment with achieving Australia’s goal of net zero emissions by 2050, while allowing ample time for markets and consumers to plan and adjust.

² Understanding the East Coast Gas Market | Bulletin – March 2021 | RBA

Similarly, new gas connections for new homes and light commercial businesses (e.g. retail, offices) should be immediately banned across Australia, given that there is no prospect that hydrogen or biomethane will be an efficient or scalable solution for distributed gas networks. It therefore makes no sense to continue to expand a network that cannot deliver net zero emissions. These gases may however make an important contribution in the industrial sector as chemical feedstocks or for hard-to-electrify energy needs such as very high-temperature process heating.

Next, governments should provide incentives for early movers, and assist low-income households to be among them, ensuring that wherever appliances are replaced, consumers are strongly incentivised to select a more efficient electric appliance or vehicle. All electric appliances (e.g. heat pumps, electric vehicles) are typically more expensive than their fossil fuel equivalents, and as such, governments should seek to close the cost gap. This could be delivered through a variety of methods from rebates to tax write offs, though we note that the objective should be to make the process as simple as possible. These incentives can complement access to low-cost finance via the Clean Energy Finance Corporation, which the Government announced in its Budget earlier this year.

As a further measure to support lower-income households, and as recommended by the Grattan Institute in its recent *Getting off Gas* report, Government should also consider introducing a tax-write-off for landlords who opt to replace broken gas-based appliances with efficient electric ones.

Finally, governments should ultimately use regulation to enforce broad-based change, by outlawing the sale of less efficient appliances and vehicles through tightening efficiency standards.

Throughout this change, strong communication and public information campaigns will be required, to ensure that all consumers are aware of the direction of travel, and Australians do not wind up investing in new equipment which will not only cost them more to run, but may also have a limited lifespan.

Increased investment will also be required in workforce attraction and development for electricians, plumbers and other related occupations to ensure that we can mobilise the skilled workers we need to support Australians in this major transition.

2. Energy storage solutions will minimise the role for gas-fired generation in meeting peak electricity demand, even as the share of renewables grows

The consultation paper states that *‘gas is an important fuel to generate electricity in Australia’*. While it’s true that gas does play a material role in the electricity sector today, it’s important to acknowledge that the size of this role has been declining over time from around 12 per cent in the NEM in 2014, down to around one per cent today.

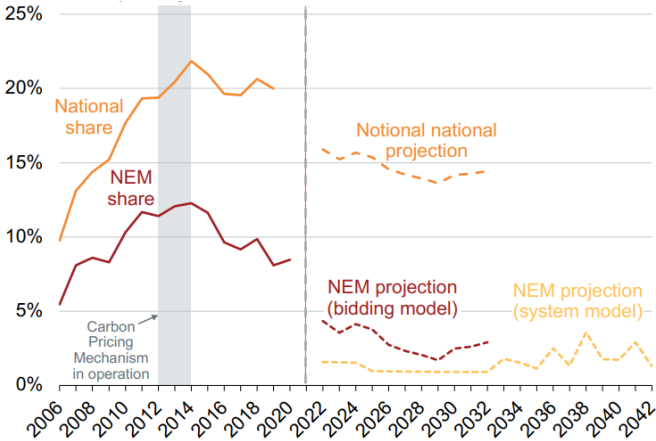


Figure 2: Gas’s share of power generation has been declining since 2014 (Grattan Institute, 2020)

The [Australian Energy Market Operator's 2022 Integrated System Plan](#) identified the role of gas-fired power generation in the electricity system over the coming decades to be in assisting to meet peak demand, providing backstop generation for periods of lower renewable energy generation, and in providing system services.

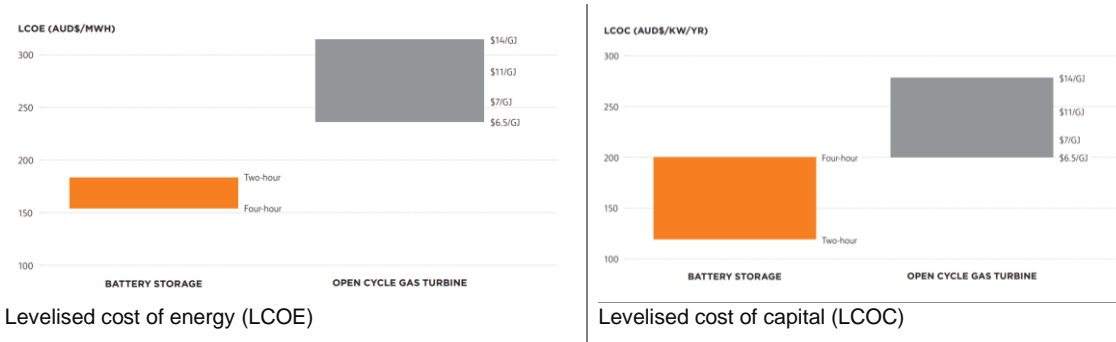
'[Gas fired power generation] will complement battery and pumped hydro generation in periods of peak demand, particularly during long 'dark and still' weather periods. It will help cover for planned maintenance of existing generation and transmission. And it will provide essential power system services to maintain grid security and stability, particularly following unexpected outages or earlier than expected generation withdrawal.'

The Step Change scenario within the Integrated System Plan modelled that gas-fired power's share of NEM generation will peak in around 2040 at ~3 per cent. And as the Grattan Institute has pointed out, the 'backstop' role that gas fired generation will play *'does not require large volumes of gas'*³. These backstop gas plants, where required, will ultimately need to be run on renewable gas in a carbon-constrained economy.

The consultation paper suggests that gas-fired power generation will *'play a key role as the electricity sector moves to renewable energy sources'* in supporting grid firming and reliability. We note that with the rise of a wide range of energy storage solutions, the market expects that technologies such as battery storage, pumped hydro and other emerging solutions such as compressed air, thermal storage and redox flow batteries, could further reduce or displace the role of gas-fired power generation for firming.

This portfolio of renewable energy storage technologies is capable of delivering fast-start response, sustained energy supply, and valuable system services such as fast frequency response, voltage control, inertia and system strength.

The CEC expects that renewable energy storage solutions will also be a more cost-effective solution for grid firming than gas-fired power generation. In 2021, the CEC published the report [Battery Storage: The New Clean Peaker](#), which found that batteries were cheaper than open-cycle gas turbine plants for providing electricity peaking services. The paper compared a new 250 MW gas peaker with a 250 MW four-hour grid-scale battery, finding that the battery provided cost savings of more than 30 per cent while offering greater flexibility and significantly reducing emissions intensity.



Figures 3 & 4: Battery storage outcompetes gas peakers on a levelised cost of energy (LCOE) and levelised cost of capacity (LCOC). (Clean Energy Council, 2021)

Given that this study occurred before the global energy market disruptions of the Russian invasion of Ukraine, and the ensuing commodity price spikes (which have now moderated but remain

³ Page 3, [Flame out: the future of natural gas](#), The Grattan Institute, 2020

elevated), the commercial case for battery storage over gas-fired power peaking has only strengthened.

And indeed, the Clean Energy Council has seen significant growth in large-scale battery investments in recent years, with 8,000 MWh of new large-scale battery storage financially committed, under construction or commissioned in 2023⁴. The Australian Government's Capacity Investment Scheme, which aims to bring forward 6 GW of new renewable energy and storage projects by 2030, is expected to drive continued investment over the remainder of this decade, in line with the Government's 82 per cent renewable energy target.

Pumped hydro can also play a significant role in providing flexible 'peaking services' and in supplying energy during less frequent, prolonged periods of energy supply shortfall due to reductions in wind and solar output. With fast-start and fast-ramping characteristics, hydropower can also respond rapidly to dynamic changes in our energy system and maintain this service provision for as long as is necessary to 'keep the lights on'. While these projects typically have longer development timeframes, the expected asset life is more likely to be measured in centuries rather than decades. The first of the next generation of pumped hydro projects are currently under construction, with Australia's first pumped hydro project in 40 years – the 250 MW Kidston Pumped Storage Hydro Project in far north Queensland – expected to be completed in 2024.

3. Australia should invest heavily in renewable gas development and substitute the value of our liquefied natural gas (LNG) sector with growing green value-added products and exports

Accelerating international momentum to meet decarbonisation goals and decouple from volatile fossil fuel prices is beginning to drive demand for green commodities such as metals (iron, alumina) and fuels (ammonia, methanol). This presents a major opportunity for Australia which we are well-positioned to capture. It is imperative that we seize it.

Our three largest exports today are iron ore, coal and liquefied natural gas (LNG). Two of them – coal and LNG – collectively worth \$185 billion in exports to Australia in 2022, should now be treated as sunset industries. As a minimum, they will have dramatically reduced – if not negligible roles in the net zero world of 2050.

It would be highly unwise, if not irresponsible, to plan for the substantial continuation and even expansion of fossil-based gas extraction in Australia in the coming decades on the assumption that carbon capture and storage will be a cost-effective and reliable solution for mitigating emissions. Australian Governments have invested over \$1.3 billion of taxpayers' money in carbon capture and storage initiatives in the past two decades, with no large-scale operational projects to show for it. Meanwhile, Chevron's Gorgon LNG facility in Western Australia, which is required to capture the emissions of its plant as a condition of its environmental licence, is only sequestering 30 per cent of the emissions promised, years after it began operation. It is difficult to imagine a scenario in which large LNG facilities will enjoy the social licence to operate in one or two decades' time without very high rates of permanent carbon sequestration. Finally, it is important to acknowledge that LNG projects can only attempt to capture part of the emissions associated with their lifecycle. A significant proportion of emissions are associated with the gas combustion in the final end-use/export destinations.

Australia must plan in earnest now for the new commodities and markets that can replace the revenue and employment value of the LNG and coal sunset industries. Two major categories for value-added green energy markets are emerging as frontrunners for domestic production, based on their ability to leverage our comparative advantages in renewable energy and mineral resources:

⁴ [Renewable-Projects-Quarterly-Report-Q2-2023.pdf \(cleanenergycouncil.org.au\)](#)

1. Green hydrogen derivatives – ammonia and methanol, and possibly others for use as energy vectors or chemical feedstocks
2. Minerals processing – led by metals including green iron.

We discuss these opportunities and priorities below.

Green hydrogen derivatives

Renewable hydrogen derivatives such as ammonia, methanol and possibly other synthetic fuels, have the potential to become a large export market to service Australia’s power-hungry, resource poor neighbours in Asia and beyond, which are looking for suppliers of clean energy to replace natural gas, oil and coal to support their emissions reduction ambitions.

A report by Deloitte in 2019 found that if Australia were to secure the same global market share percentage of the hydrogen market as it has today for LNG, it would result in an increase to Australian GDP of up to \$26 billion on a net present value basis and 16,900 new jobs by 2050.

Australia’s rich renewable energy resources position us strongly to be a cost-competitive global supplier of renewable fuels, and we currently have the largest pipeline of green hydrogen projects in the world, as shown below. However, global competition has increased dramatically in just the past 12 months following the passing of the Inflation Reduction Act in the United States, and many other economies are now offering generous subsidies and industry support programs to attract private investment in the clean energy and the emerging renewable fuels sector.

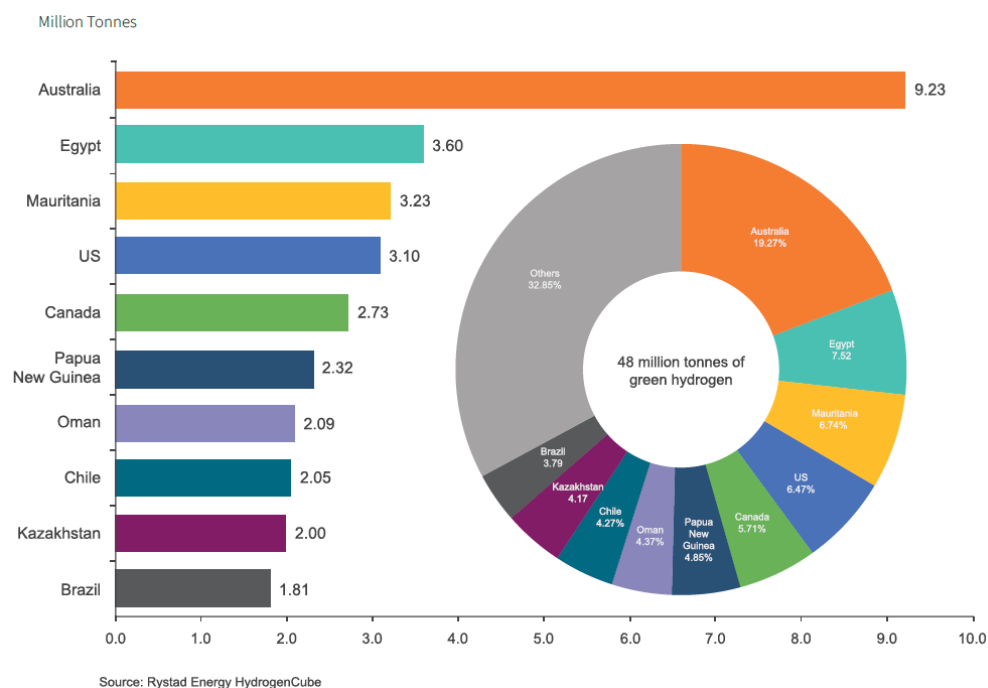


Figure 5: Top 10 countries based on green hydrogen production announcements, as at October 2022

If Australia wishes to become a leading hydrogen producer, it must dramatically boost its level of planning and investment in the sector, as it did to support the development of Australia’s liquefied natural gas sector between 2010 and 2020.

1. Strategic planning: Detailed strategic planning is required in relation to the resource, infrastructure, investment and social licence needs of a new hydrogen sector and the green industrial clusters that it helps to support. This planning includes for electricity generation and water requirements; land use; environmental and social impacts; enabling infrastructure including transmission, pipelines, and ports; community and social licence, workforce readiness and public safety.

We recommend that this detailed planning be expedited by Federal, State and Territory governments in a co-ordinated manner for identified green industrial zones/clusters. This should particularly consider the opportunities to couple green hydrogen development with green iron, ammonia/fertiliser and methanol production, as leading applications of hydrogen use.

2. Long-term policy mechanism to support large-scale green hydrogen: Australia also needs an enduring policy mechanism to support green hydrogen production. The Australian Government has announced a \$2 billion fund for the Hydrogen Headstart program, which will provide a production credit per kilogram of hydrogen. It is expected that this program will support at least two large-scale projects of at least 50 MW in capacity.

The Government has recognised that Headstart is a downpayment on the development of Australia's hydrogen industry, and it is currently considering its longer-term support. Noting that Headstart will only be able to support a limited number of projects from a large field of potential candidates, and that the uncertainty around longer term policy arrangements will have a chilling effect on projects, we urge the Government to outline its larger, long-term project support arrangements for early mover projects as soon as possible. This support should have the objective of accelerating the scale-up of Australian industry to an internationally cost-competitive basis.

We note that recent analysis by Deloitte⁵ of a range of policy support options found that hydrogen production credits were deemed to be more efficient than capital grants and investment tax credits. This analysis also found that a hydrogen production credit of AUD \$2/kg '*around half the level of the maximum credit in the IRA for renewable hydrogen*' – would be required, '*underlining Australia's underlying comparative advantage*'. This would require Government investment in the order of \$15.5 billion in today's terms over a decade. We note that this quantum is broadly commensurate with Canada's investment commitment in response to the IRA (~\$20.6 billion). According to Deloitte, a \$15.5 billion investment would put Australia on track to produce almost 16 million tonnes of renewable hydrogen a year by 2050, with exports worth \$17.4 billion per year in today's terms.

In light of both the scale of the economic opportunity for Australia, and the importance of hydrogen for underpinning a range of other potential growth sectors (eg. green iron – see below), the CEC is calling on the Australian Government to allocate \$15-\$20 billion in revenue support for early mover projects over 10-15 years⁶, as part of a wider Clean Energy Transformation Investment Fund.

3. Government procurement commitments to green content in infrastructure projects: The government sector in Australia – and in particular, State Governments – are major purchasers of commodity products such as steel and aluminium for major infrastructure projects such as roads, bridges, railway lines, buildings and other public infrastructure enhancements and expansions. The public sector can utilise its significant purchasing power to provide demand for green/greener commodities.

Federal, State and Territory governments could, for example, set firm long-term targets (e.g. for 2030 and beyond) for local, green content within their infrastructure projects, which could provide much-needed local demand for green commodities including hydrogen, iron, steel and aluminium, and for the establishment of zero or low-carbon manufacturing facilities.

Green iron

In a net zero emissions world where Australia enjoys an advantage as a producer of clean, low-cost electricity, it will be logical for Australia to play an expanded role in mineral refinement processes. This includes for iron ore, bauxite (the mineral used for alumina/aluminium

⁵ Australia's Hydrogen Tipping Point | Deloitte Australia

⁶ Clean Energy Council releases Power Playbook | Clean Energy Council

production), copper, lithium, nickel, cobalt, manganese, and a range of rare earth elements (e.g. vanadium, silicon).

A particularly attractive processing opportunity for Australia is the reduction of iron ore to iron metal with the use of renewable electricity and green hydrogen as a reduction agent (in place of metallurgical coal). This would significantly reduce the future electricity demand of our existing iron ore customer markets (China, Japan, South Korea) – many of whom are resource or space constrained – while enabling them to largely retain their existing steel production industries and workforces. This decarbonisation strategy for the steel industry would be much more energy efficient than a model in which Australia would ship both iron ore and green hydrogen to steel producing countries, given the energy losses involved in hydrogen compression or conversion to more transportable energy carriers (e.g. ammonia).

To capture the full opportunity that green iron presents, strong investment will be needed to upgrade some of our most plentiful iron ore resources (haematite) into products with higher iron concentrations, suitable for green iron production. The Government should support research and development efforts in this important area, noting its strategic economic value to the nation.

Next, the Government should move to quickly declare green iron a priority development market and allocate at least \$10–\$15 billion within the proposed Clean Energy Transformation Investment Fund to attracting early mover green iron plants in Australia over the coming decade. These plants are highly capital intensive and require long lead times for development. Any aspiration to build green iron processing capacity in Australia by 2030 would require immediate action.

Conclusion

In conclusion, the development of Australia's Future Gas Strategy is a critical opportunity for the Federal Government to plan for the declining role of fossil-based gas in both meeting Australia's domestic energy needs and in terms of our terms of trade and revenue base.

Renewable energy paired with a portfolio of energy storage solutions and transmission can meet many of Australia's energy needs while enhancing our productivity, reducing costs to consumers, and driving down our emissions. We therefore encourage the Government to continue to provide the policy and program support to accelerate the net zero transition of the electricity sector, and promote the rapid uptake of electrification.

Meanwhile, the Government should commit significant resources to the strategic planning and investment in the emerging renewable fuel sectors – led by green hydrogen and its derivatives – to support both hard to electrify/abate sectors in Australia, and grow green energy export markets which can ultimately replace the value of declining fossil fuel exports.

We look forward to working in partnership with the Government in accelerating Australia's clean energy future.

Yours sincerely,



Anna Freeman
Policy Director – Decarbonisation