

29 September 2023

Committee Secretary
Senate Economic References Committee
Department of the Senate
PO Box 6100
Parliament House
CANBERRA ACT 2600
AUSTRALIA

Dear Committee Chair and members

Senate inquiry into residential electrification

Energy Networks Australia (ENA) welcomes the opportunity to submit this response to the Committee's inquiry into residential electrification.

ENA represents Australia's electricity transmission and distribution and gas distribution networks. Our members provide over 16 million electricity and gas connections to almost every home and business across Australia.

ENA has a clear mandate from its members to advocate for policy and regulation that puts the customer at the heart of the energy transition.

Our submission focuses on the benefits of decarbonisation across the whole energy system. Customers' efforts to decarbonise their homes in many ways mirror the choices in the broader energy system. Getting our focus right is critical for Australia's transition:

1. Our collective focus must be on decarbonising at least cost to meet net-zero emissions targets. Policy choices should holistically consider the whole of the energy system, targeting areas with the greatest emissions reduction, at least cost to customers and our communities. That is, the electricity, transport, and heavy industry gas sectors.
2. As a nation, our commitment to removing coal from the electricity system is the right choice and our focus and commitment to building new transmission and connecting renewables is now more important than ever. The distribution grid must also play a critical role, with the capacity to host additional renewable generation and facilitate flexible demand measures from smarter customer energy resources.
3. The path to decarbonise the light vehicle transport sector by incentivising EVs and facilitating their charging infrastructure is also a step in the right direction. Energy networks are critical platforms for the effective roll-out of EV infrastructure and storage needed across the grid.
4. For the future of heavy industry in Australia, the initial focus for decarbonising the gas sector must shift to developing a pathway to renewable gas for industry, leveraging the critical role of gas networks in that pathway. Policy decisions to decarbonise the gas sector must fully consider the broader implications for the whole system.

- Customers are now truly at the helm when it comes to our energy future. Customers want to be a part of the solution and should have access to clear and accurate information about how they can continue to make choices to decarbonise their households in a way that suits them. It is vital that we don't leave any customers behind in this transition.

1. Decarbonisation is a once-in-a-century opportunity (TOR (a) (c) (i))

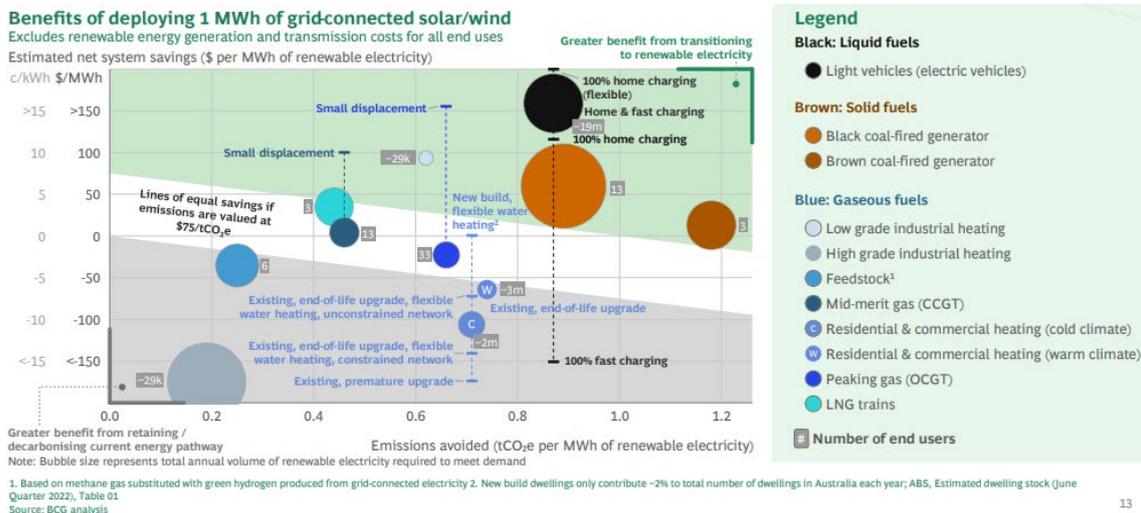
Decarbonising Australia's economy is the defining challenge of our time. It is also an unparalleled opportunity. Decarbonising at the least cost will leverage our natural resource advantages, positioning Australia as a leading competitor and provider of choice for a global economy that is also decarbonising.

Policy choices must be made in an integrated, whole-of-energy system context to decarbonise the economy at the lowest cost. A well-coordinated policy approach reduces the risk of excessive costs, higher emissions, and unintended impacts on energy consumers and the economy.

Data suggests we can make the greatest emissions reductions by removing coal from our grid, replacing our fossil-fuel light vehicles with electric vehicles (EVs) and solving for industrial processes that rely on high-heat manufacturing or use gas as feedstock.¹

A useful exercise to inform the economy-wide decarbonisation challenge is to consider the costs and emissions benefits from decarbonising by replacing activities with firm renewable electricity. This question was posed in the recent Boston Consulting Group report, with its key findings shown in the figure below.²

In this figure, the **size of the bubble** indicates the volume of emission that could be reduced in the sector, the **position on the X-axis** indicates the emissions intensity of the activity, and the **position on the Y-axis** shows the net system savings from replacing that activity with firm renewable electricity.



¹ Department of Climate Change, Energy, the Environment and Water: *Quarterly update of Australia's National Greenhouse Gas Inventory: December 2022*, March 2023.

² Boston Consulting Group: *The role of gas infrastructure in Australia's energy transition*, June 2023.

The BCG analysis highlights that:

- Coal-fired electricity generation (the two brown bubbles) is the sector with the most significant volume of emissions with the greatest emissions intensity that can be replaced by firming renewable electricity with high net system savings
- Light vehicle transportation (the black bubble) is the sector with the next largest volume of emissions with high emissions intensity. This activity also has the highest net system savings when replaced with firming renewable electricity
- Transitioning gaseous fuels (all the other bubbles) to firming renewable electricity is a more complex story. The most significant volume of emissions from gas comes from high-grade industrial heating and feedstock, which are very emissions-intensive and are costly or unable to be replaced with firming renewable electricity. Other uses of gas fuels (such as household uses) represent smaller overall sources of emissions and have varying cost and emissions intensity implications.

The critical takeaways are that it makes sense, based on what we know today, to rapidly decarbonise electricity generation and light vehicle transportation by transitioning these to firming renewable electricity. In contrast, the best approach to decarbonising the gas system is less clear. Decarbonising the gas system will require the development of a thriving renewable gas sector that should initially focus on decarbonising industrial gas use, which has the most significant emission reductions that can be achieved.

2. Unshackling the electricity grid from coal

Removing coal from Australia's energy mix has been a long time coming. Strong signals across state and federal governments now provide a long-term direction that Australia's coal-fired power stations must progressively exit the electricity system and be replaced by firming renewable generation. The enormity of this challenge is not lost on us – it is a difficult road ahead, but networks are up for the challenge. The transition away from coal generation in the electricity system is supported by:

- Electricity transmission networks connecting renewable generation across their existing footprint, building new transmission lines to allow renewable power to flow to where it is needed, and keeping the lights on by providing services that are lost as coal generators retire
- Transmission and other networks building renewable energy zones to connect record volumes of firming renewable electricity and
- Distribution networks supporting increased hosting of renewable electricity and storage and playing a pivotal role in facilitating the flexible electricity consumption required to keep system costs down for customers.

This work must continue at pace. This involves unlocking investment to deliver actionable Integrated System Plan (ISP) projects and renewable energy zones on time, ensuring smooth and efficient grid connection for renewables and storage. It also involves rapidly evolving critical regulatory arrangements so they are fit for purpose during and after the transformation. This should consider how distribution networks can better support the roll-out of storage that captures and stores renewable energy and with the right tariff structures, can make green energy more affordable and within everyone's reach, no matter their means.

Electrification to decarbonise only makes sense if our electricity supply is largely renewables and if coal is removed from the system.

Uniting the nation on the pathway to build the transmission and storage infrastructure is critical to a successful transition. By coming together now, we can unlock the affordable and sustainable future that renewable energy offers us for generations to come.

3. Highway to electric vehicles

The decarbonisation of the transport sector is a massive opportunity for energy customers and should be considered part of the home's decarbonisation journey. EVs for light vehicle transport will play a significant role in the decarbonisation of the transport sector. The effective decarbonisation of this sector relies on:

- The continued decarbonisation of the electricity system, and
- The use of smart incentives and approaches to ensure that EVs soak up excess renewable electricity and do not materially extend or increase fossil fuel generation.

The efficient integration of EVs into the electricity system will help spread costs across greater electricity consumption, reducing electricity prices in the long run. Our analysis shows that combined household energy bills (electricity plus liquid fuels for transport) are significantly lower when a customer transitions to an EV.³ A customer's home decarbonisation efforts are well progressed by replacing a petrol or diesel vehicle with an electric vehicle when they can do so.

Getting the right balance of infrastructure investment for customers across the electricity supply chain requires effective regulatory planning and reform, price signals, and approaches to ensure that EVs do not add significantly to peak demand on the grid.

Overall, electricity networks are preparing for this change to the use of the grid and have trials underway to explore how to manage demand, incentivise behavioural change and find effective ways to use EVs to soak up excess renewable electricity as it comes online. Regulatory reform could help electricity distribution networks turn these trials into general practice, ensuring critical infrastructure arrives in time, or ahead of the curve, for when customers need it.

4. Renewable gas delivered by networks is needed to keep industrial jobs in Australia (TOR 1(k))

The decarbonisation of Australia's gas system is a complex problem that has enlivened furious debate and insufficient action in areas where it really matters for most Australians.

Australia must continue to refine materials and manufacture goods. Around 40 per cent of Australia's gas use occurs in manufacturing and industry, compared with about 10 per cent used in homes. Many applications in this sector are either impossible or too expensive to abate through electrification. The scaling-up of renewable gases, such as bio-methane and hydrogen, must occur quickly for this sector to survive and thrive.

The sheer scale of industrial energy consumption presents opportunities for policies to deliver investment in renewable gas technologies. This can help drive innovation, reduce costs through economies of scale, and accelerate the development of renewable gas infrastructure and supply chains while keeping

³ Energy Networks Australia, *Mind the gap: navigating a customer focused transition*, June 2023.

Australian jobs on shore. Existing gas infrastructure is a critical platform for the successful and reliable delivery of renewable gas to industry at scale.

Innovative projects to get renewable gases to industry are already underway in Hydrogen Park South Australia, the Western Sydney Green Hydrogen Hub, and the Malabar Biomethane Injection Plant, where renewable hydrogen blends and biomethane are being delivered to customers on the existing gas network.⁴ While this renewable gas flows to all customers on the local network, it provides opportunities for industry to purchase renewable hydrogen and biomethane to displace natural gas. Emerging certificate schemes are needed to provide opportunities for industry to offset emissions from their gas use. Existing gas networks are critical to developing these decarbonisation pathways for industry and the transition to renewable gases for industry and to keep our options open for the broader use of renewable gases. Urgent focus is required on pathways to decarbonise this sector, and gas networks are already delivering trials like this, which could be supported and scaled up.

Immediate opportunities to accelerate this pathway include building on the Hydrogen Headstart program and introducing a bio-methane certification, similar to the hydrogen guarantee of origin scheme.

The debate needs to correct away from a narrow lens of gas versus electricity for households, especially while coal is in the system which reduces the emissions benefit in switching. Instead, there is a growing urgency for renewable gas solutions for industry to address larger-scale energy consumption, reduce significant emissions, and support economic and environmental sustainability on a broader scale. And until we better understand the future of heavy industry currently relying on gas network infrastructure, we should be mindful of any policy that could inadvertently rule out this pathway.

5. A fair transition for all of Australia's families (TOR (a) (d))

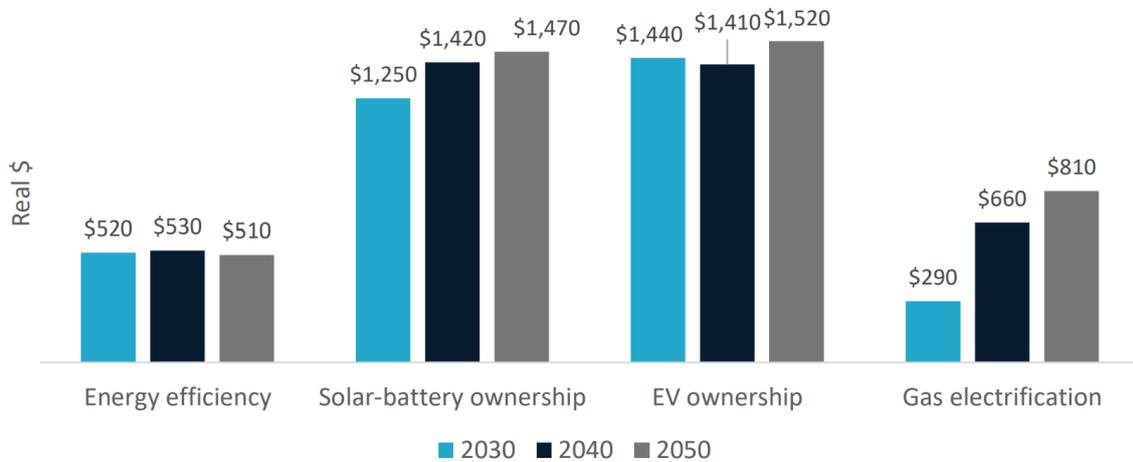
At the heart of our transition is every Australian home, and customers can and want to participate in the transition in a meaningful way. It is on us to ensure we don't leave anyone behind. Solutions that decarbonise our whole energy system at least cost are the same levers that decarbonise our homes.

Australian households should be encouraged to continue to make choices to decarbonise their homes in ways that suit their needs and in an affordable, staged approach. Australia has some of the highest rates of installed rooftop solar and customers want to continue to be a part of the solution to reducing emissions.

While individual circumstances will vary, research consistently shows that the best 'bang for buck' to decarbonise households starts with rooftop solar and batteries, energy efficiency practices and purchasing an EV. The cost implications for households are highlighted by research conducted by CSIRO and Dynamic Analysis for Energy Consumers Australia (ECA), with key results shown in the figure below.⁵

⁴ Energy Networks Australia, *Renewable gas innovation: delivering renewable gas to customers*, August 2023.

⁵ CSIRO and Dynamic Analysis, *Consumer impacts of the energy transition: modelling report*, July 2023.



The greatest near-term benefits come from EVs, solar and batteries, and energy efficiency. We support ECA’s key policy recommendations from this research that:

- Households need the right information at the right time from a trusted source that is clear and, in their language, to empower them to make decisions that are right for their situation, and
- Households that face barriers to electrifying their homes will need support so that no one is left behind, so that the last households to electrify (which we take to include solar, EVs and energy efficiency) are the ones that choose to wait, not those who could not afford to.

Any support for household emissions reductions should be targeted at those most in need and initially at the improved efficiency, solar and EV applications that will make the biggest difference for customers. As a whole, electricity and gas networks support helping customers to make *decarbonisation choices* that are best suited to them, at least cost. There is no one-size-fits-all solution, and individual circumstances must be considered, including location, budget, and home type.

ENA is happy to further engage with the Committee as it sees fit. In the meantime, if you would like to discuss this submission, please get in touch with Dominic Adams, General Manager Networks (dadams@energynetworks.com.au).

Yours sincerely



Dominique van den Berg
Chief Executive Officer