



12 September 2023

Submission: ACT Integrated Energy Plan

APGA represents the owners, operators, designers, constructors and service providers of Australia's pipeline infrastructure. Pipelines facilitate 28 per cent of Australian energy consumption by connecting natural and renewable gas production to gas customers. APGA members are at the forefront of Australia's renewable gas industry which represents a real, technically viable solution to lowest-cost gas use decarbonisation. As set out in Gas Vision 2050, APGA sees renewable gases such as hydrogen and biomethane playing a critical role in decarbonising gas use for wholesale and retail gas customers.

APGA welcomes the opportunity to contribute to the ACT Government's consultation on the proposed Integrated Energy Plan (the Plan) for the ACT. APGA's submission re-states the case for dual renewable electricity and renewable gas decarbonisation pathways for the ACT. We note that such pathways are already underway in other jurisdictions and outline how the ACT could access a renewable gas supply through similar mechanisms as accessing a renewable electricity supply.

To support the Integrated Energy Plan APGA **recommends** that the ACT Government implement and review both an electrification and renewable gas demonstration pilot in two separate suburbs as part of Stage One of the Plan. Learnings from these pilots would then be able to inform Stages Two and Three to better deliver a fair, equitable and orderly transition to net zero by 2045 in line with the Integrated Energy Plan's intent.

The pages which follow include an update on the most recent facts relating to renewable gases followed by answers to consultation questions.

To discuss any of the above feedback further, please contact me on +61 422 057 856 or jmccollum@apga.org.au.

Yours sincerely,

A handwritten signature in black ink, appearing to read "JM", is written over a light grey, semi-transparent rectangular background.

JORDAN MCCOLLUM
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Australian Pipelines and Gas Association

The decarbonisation opportunities presented by renewable gas

APGA appreciates it is the intention of the ACT Government to develop a plan for implementing its policy objective to transition the Territory away from gas and towards full electrification. The Plan assumes that a transition from fossil energy to renewable energy will not include renewable gas as a viable option.

APGA is concerned that the ACT continues to pursue full electrification, rather than full decarbonisation. Doing so risks preventing ACT residents from accessing cost competitive decarbonisation options through renewable gas supply, while locking in the challenges of a 100% electrified approach – challenges identified by The Grattan Institute which will negatively impact low-income homeowners, renters and apartment buildings the most¹.

APGA provided a response² to the ACT Government’s consultation on the regulation to prevent new natural gas connections which provided a range of information about the potential of renewable gases to displace natural gas use. Since this response, new research has been published by Boston Consulting Group (BCG) in June 2023 demonstrating the cost competitiveness of renewable gas use in the home.³

Renewable gases – green hydrogen and biomethane – are by definition net zero emissions energy sources. If renewable gases are cost competitive for gas use decarbonisation in the home, this means that customers have greater choice, greater opportunity, and greater capacity to decarbonise household gas demand.

Beyond elaborating on the BCG report’s findings, APGA would like to reiterate from previous submissions:

- Renewable gases can provide a cost-competitive pathway for the decarbonisation of residential gas use⁴, and remains the only decarbonisation pathway for many industries.
- Renewable gases can maintain choice for ACT consumers for cooking, space heat and hot water.

The case for renewable gas in climates such as the ACT

BCG undertook a like-for-like analysis considering decarbonisation of gas use in a range of different sectors. The output from this analysis can be seen in Exhibit 6 of the report included at the end of this section. This analysis, considering combined appliance and

¹ The Grattan Institute, 2023, *Getting off gas: Why, how, and who can pay*, <https://grattan.edu.au/wp-content/uploads/2023/06/Getting-off-gas-why-how-and-who-should-pay.pdf>

² APGA, 2023, *Submission: Regulating for the prevention of new fossil fuel gas network connections*, https://www.apga.org.au/sites/default/files/uploaded-content/field_f_content_file/230420_apga_submission_-_act_gas_connections.pdf

³ Boston Consulting Group, 2023, *The role of gas infrastructure in Australia’s energy transition*, <https://jemena.com.au/documents/reports/the-role-of-gas-infrastructure-in-australia-s-ener>

⁴ APGA, 2022, *Supply chain analysis methodology for total customer cost*, https://www.apga.org.au/sites/default/files/uploaded-content/website-content/supply_chain_analysis_methodology_for_total_customer_cost_-_final.pdf

Study summary:

<https://www.apga.org.au/sites/default/files/uploaded-content/website-content/supplychainv5.pdf>

delivered energy costs, identifies decarbonisation of all current gas use sectors via renewable gas bar one as being cost competitive or cheaper than electrification.

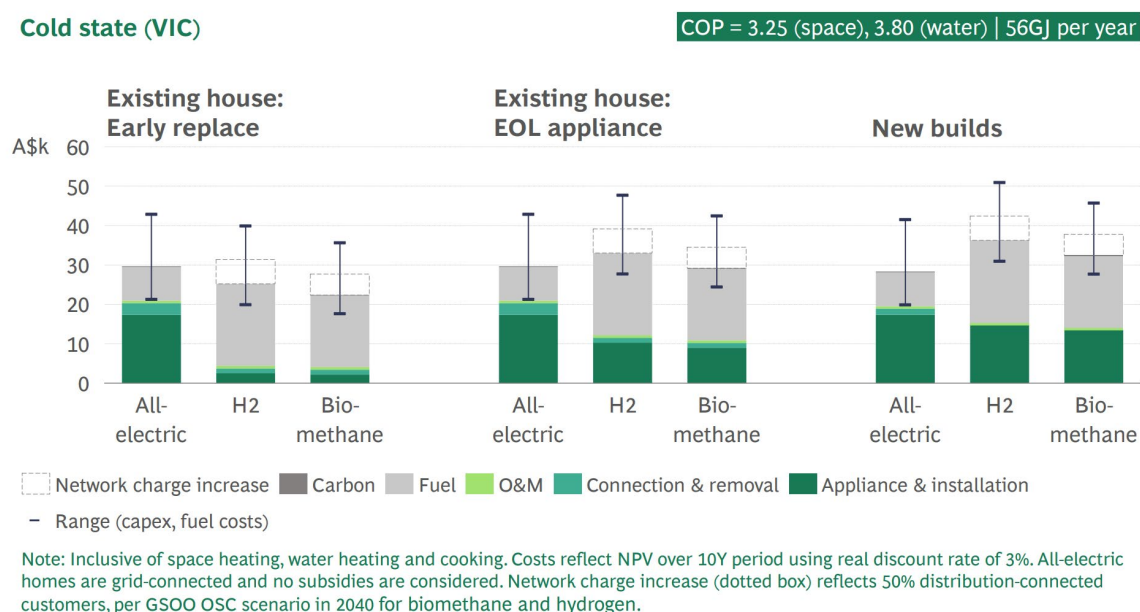
Importantly, household gas use decarbonisation via renewable gas has been identified as BCG as either cost competitive or cheaper than electrification.

More than this, the report demonstrates where renewable gas advocates and governments appear to be talking at cross-purposes in this discussion.

This can be seen through Figure 1, which considers combined energy and appliance costs for household gas users which decarbonise through electrification, hydrogen or biomethane pathways. Each energy option includes a possible range of cost outcomes for different households considering the range of different potential appliance costs, and the range of different potential energy costs.

One conclusion from this example is the lowest end of the all-electric cost range for *Existing house: EOL appliance* and *New builds* analysis is lower than the lowest value on the hydrogen and biomethane ranges. This means it is possible to achieve a lower cost outcome with the all-electric option. This interpretation is factually accurate interpretation, but incomplete.

Figure 1: Cost comparison for electricity, green hydrogen and biomethane for residential users in 2040, at different points of appliance replacement



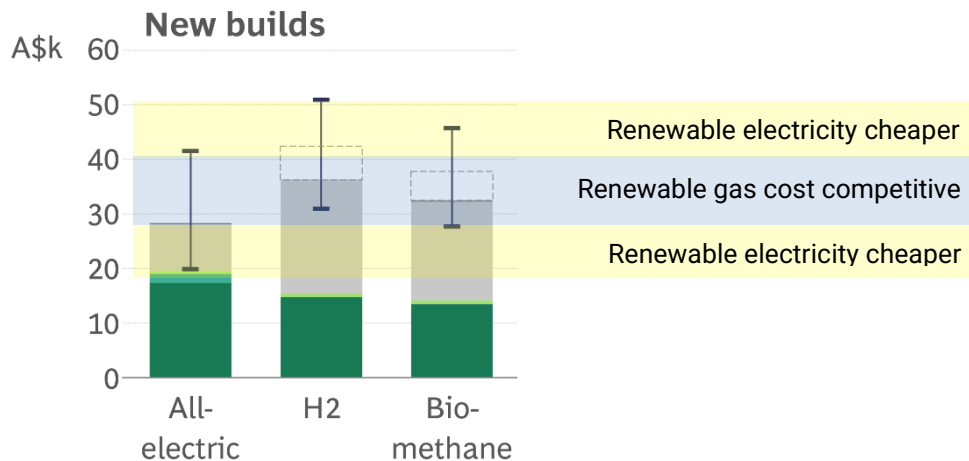
Source: BCG, 2023, *The role of gas infrastructure in Australia's energy transition*

A broader interpretation of this data considers the overlap of the cost ranges (Figure 2). While it may be possible for some household energy customers to achieve the lowest all-electric appliance buildout and access the lowest cost electricity, the range indicates that this is not the rule for all households.

Rather, the existence of overlap between all-electric, hydrogen and biomethane cost ranges indicates that there is a range of household gas customers for which renewable gas and

renewable electricity both pose cost competitive gas use decarbonisation options. This is the crux of the renewable gas opportunity for decarbonising gas use in the home in the ACT.

Figure 2: Overlap of the cost ranges for new build dwellings



Source: BCG, 2023, *The role of gas infrastructure in Australia's energy transition*

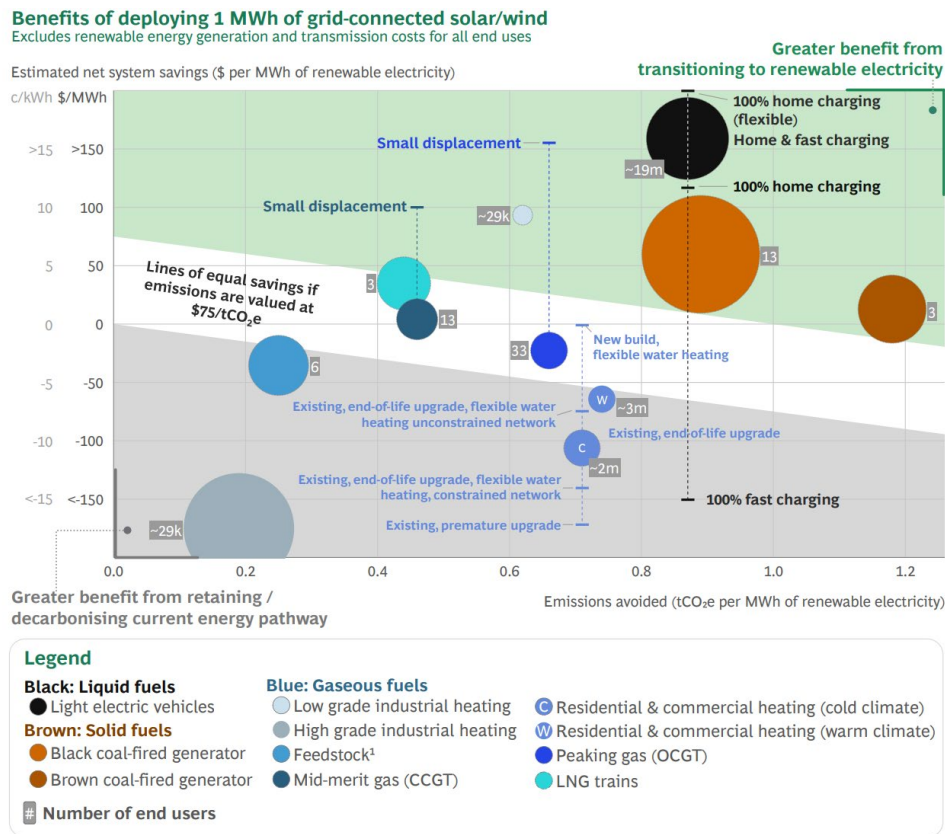
If renewable gas is cost competitive with renewable electricity for gas use decarbonisation in the home, then enabling renewable gas creates more choice and opportunity for household decarbonisation. It addresses many challenges of 100% electrification pathways:

- Low income households can avoid spending tens of thousands of dollars which they cannot afford to purchase electric appliances and electricity supply upgrades
- Renters can choose to contract renewable gas where their landlords refuse to pay tens of thousands of dollars to replace their gas appliances with electric appliances
- Apartment complexes can contract renewable gas instead of facing the cost of replacement of central systems or, in extreme cases, demolition of the building
- As government funding can only subsidise a small portion of more costly electric appliances, expanding funding to high efficiency, hydrogen-ready gas appliances can achieve much higher value.

While households are the toughest challenge for gas use decarbonisation due to sheer numbers, industry is challenging as well. The analysis in Figure 3 addresses these energy customers, demonstrating the cases where a renewable electricity transition or gas use decarbonisation is more advantageous. Renewable electricity will have the greatest impact if first used to displace coal generation and liquid fuels.

APGA hopes that this new information will help the ACT Government expand its horizons when it comes to its renewable energy options in favour of its residents and businesses having equal access to all cost competitive gas use decarbonisation options.

Figure 3: Grid-connected renewable electricity vs decarbonisation of current energy pathways



Source: BCG, 2023, *The role of gas infrastructure in Australia's energy transition*

Renewable gases are already decarbonising gas use in other jurisdictions

Biomethane is currently being used at scale in Europe. Denmark has expanded gas supply from biomethane from 10 per cent in January 2020 to 39 per cent in August 2023, and is expected to achieve 70 per cent decarbonisation of its gas infrastructure assets by 2030. Other countries have smaller targets which are still impressive – France is working towards a 10 per cent biomethane target by 2030, which represents 22 TWh, or more than 10 times the ACT's annual gas consumption.

A biomethane demonstration project in Malabar, NSW is currently supplying the equivalent of 6,300 homes with biomethane captured from sewage and injected into the local gas network. Importantly, the production of biomethane captures emissions that would otherwise go into the atmosphere from crop residues, livestock manure, organic waste in landfill, and wastewater.

HyP SA is Australia's maiden initiative producing renewable hydrogen gas. Since beginning production in May 2021 and expanding in 2023, HyP SA provides a 5 per cent renewable gas

blend to over 4,000 customers in southern Adelaide, covering residents, businesses, and educational institutions. Additionally, hydrogen is supplied to industries via tube trailers, and now provides green fuel for Adelaide's first two hydrogen buses. Expansion plans are underway, targeting a 10 per cent hydrogen blend in regions like Gladstone, QLD, and Albury and Wodonga in Victoria.

These examples demonstrate renewable gases can operate on small scale networks like the ACT, which currently relies heavily on fossil gas for residential heating and cooking. It can also maintain the viability of local businesses and industries which cannot realistically electrify, and for whom the ACT Government at present does not have any plans to support.

The ACT Government will be able to access renewable gas easily

Potentially contrary to assumption, is not necessary for the ACT Government to develop its own renewable gas industry to access the benefits of renewable gas. In much the same way that the Territory's renewable electricity is supplied through the National Electricity Market, the ACT gas network is connected to the East Coast Gas System. The ACT can purchase renewable gas produced at scale elsewhere through tradeable certification schemes. It is anticipated that renewable gas certification schemes will operate in a similar way to the existing renewable electricity certificate trading schemes.

Gas distribution pipelines in the ACT can carry biomethane with no additional infrastructure costs, and green hydrogen with minor modifications. Reusing this existing infrastructure to carry renewable gas would be a considerable cost saving to the ACT Government compared to the significant investment in electricity infrastructure that would be required under the Plan. This will also avoid ACT Government policy causing stranded public and private assets, with associated additional costs and safety risks.

Should the ACT Government be interested in investing in a local renewable gas industry, biomethane is a strong option exists given the Territory's existing waste feedstock, penetration of renewable energy generation, and sizable existing gas customer base.

The ACT should consider the effects of all options

APGA is concerned that both the gas connection ban and the Integrated Energy Plan will nullify the possibility of renewable gases ever being able to assist the ACT's decarbonisation journey. Before cutting out a renewable gas option, the ACT Government needs fully consider the potential effects of this decision, for both current and future energy consumers.

APGA Recommendation: Pilot sites to inform a managed and just transition

Stage One of the Integrated Energy Plan places a strong focus on switching consumers to electricity. While this is in line with the ACT's intent there will be challenges and learnings from both this process and also the safe and cost-effective decommissioning of the gas network. These include the potential effects on niche applications already identified in the Plan including industry users, commercial users, and some complex residential applications.

A pilot suburb electrification project would provide vital early learnings regarding community communication, operational and safety consideration, cost and other consumer outcomes from the decommissioning of a gas network. Similarly, a pilot suburb renewable gas contracting project could help demonstrate the practicality and impacts of transitioning a

suburb to renewable gas. These learnings could then inform Stage Two and Three of the plan to best support a managed and equitable transition.

To this end the APGA recommends the ACT Government **implement an electrification pilot project in an ACT suburb** – similar to what has taken place in Esperance in Western Australia.⁵ To be effective, this pilot would need to apply to the entire suburb – every household, every business, every building.

This would allow the ACT Government to undertake the necessary and challenging work that would be required to support Territory-wide electrification, including:

- Incentives or subsidies to households and businesses to replace gas appliances
- Transition plans and compensation for businesses that may not be able to electrify
- Physical practicalities of arranging gas disconnections or abolishment, and managing safety issues with decommissioning of the reticulated gas network
- Electrical substation upgrades that may be needed for the suburb, and system upgrades for households and businesses
- Location and accessibility of EV charging infrastructure
- Consideration of the relevant portion of Evoenergy’s regulated asset base.

This should be paired with a **renewable gas contracting pilot project in another suburb** in the ACT, again to inform the ACT’s Plan to achieving net zero 2045.

Such a project would require wholesale gas customers and suppliers of retail gas customers to contract renewable gas to supply the suburb – transported from anywhere in the East Coast Gas Market – in the same time period. Such a pilot would help demonstrate any challenges in commercially accessing and transporting renewable gases to gas customers. To be effective, this pilot would need to apply to the entire suburb – every household, every business, every building.

Both of these pilots should be reviewed prior to the drafting of Stages 2 and 3 of the Plan to ensure the learnings can be incorporated before moving beyond the consumer-led stage.

⁵ <https://www.wa.gov.au/government/media-statements/McGowan-Labor-Government/Esperance-electrification-project-an-energy-transition-first-20230331>

Answers to consultation questions

About the Integrated Energy Plan

1. *Do you think the proposed Integrated Energy Plan principles to guide the ACT Government will support a successful transition to electrification in the ACT? Are there any areas missing?*

As noted in our substantive response, APGA fundamentally disagrees with the basic premises of the Plan. That is, the ACT can and must entirely electrify to meet its emissions reduction targets, and that gas has no role in this transition. APGA observes that greater focus on achieving net zero overall, rather than pre-empting the solution with a specific focus on electrification, would provide more equitable outcomes for many consumers in the ACT.

As can be seen in the challenges faced with other jurisdictions in their renewable energy transitions, gas will likely be required long into the future, and attention needs to be paid in transitioning fossil gas use to *renewable* gas use.

APGA notes that the ACT Government is open to the possibility of renewable gases, exempting 100 per cent renewable gas connections, and potentially blends, from the gas connections ban that is currently in effect.

Developing the future energy network and sharing the costs

2. *What are the barriers to uptake of consumer energy resources and other technology, such as batteries, solar panels and electric vehicles?*

The major barrier is cost. Wholesale electrification will be expensive for both consumers and for the ACT Government. Electric appliances are more expensive to purchase and install than gas appliances, and disconnecting or abolishing household gas connections is also costly. Increasing the proportion of EV charging on the network will increase the demand on local grids and will require extensive upgrades, both at the grid level and for individual households, many of which will need to upgrade to three phase power.

Electric appliance efficiencies are also dependent on climate. Heat pump technologies are generally not suited to colder climates. In the ACT, winter temperatures regularly dip below zero. These appliances will need to draw far more power than their typical nameplate capacity, impacting their efficiency.

Cost comparisons do not always consider like-for-like replacement of gas appliances with electric appliances. Many households will need to invest in more or larger electric appliances than considered in some comparisons to achieve the same level of heating amenity – assuming the ACT government does not expect its citizens to live with colder households in order to decarbonise.

The great advantage of renewable gases is that in comparison, only small modifications are required by consumers if at all. Biomethane is chemically identical to natural gas and will require no consumer or network augmentation. Green hydrogen will require minor modifications to existing household appliances and gas networks, costing much less than

electric appliance replacement – an important consideration for low socioeconomic demographics.

Instead of dismissing renewable gas as an option, the ACT Government can anticipate the appliance transition by mandating that all new gas appliances be sold 'hydrogen-ready' by a sensible transition date. High efficiency gas appliances are also generally cheaper than high efficiency electric appliances, especially heat pump and induction devices.

3. *Would [sic] are the benefits of the ACT using a consumer-led approach during the first IEP (to 2030) to transition the ACT towards electrification? A consumer-led approach means the community will be encouraged to transition off gas at a time that suits them. Consumers will decide if and when they adopt consumer energy resources, such as solar and batteries, and electric vehicles.*
 - a. *Do you think there is any benefit for a staged transition approach following an initial consumer-led transition? What would be the barriers of such an approach? For example, after 2030, this could be a suburb-by-suburb staged transition approach.*
 - b. *Do you have a preference for any approach?*

APGA disagrees with the presumption of this question as the current 'consumer-led' approach still insists consumers divest of using gas for heating and cooling in their homes. A true consumer-led approach would respect the choices of consumers and provide pathways for the transition to renewable gas for consumers who wish to do so.

Assuming 'staged transition approach following initial consumer-led transition' means forced disconnections, it is important to understand that there are minimum costs for safely operating a gas network. As the number of connections decreases, those network costs are shared across a smaller and smaller number of consumers, who will have to pay a higher and higher share. This is inequitable, especially as those remaining are likely to be least able to pay and will likely require considerable government subsidy to maintain the operation of the gas network even as it forces decreasing the number of connections.

Electrifying our community

4. *What can be done to further encourage electrification among those households that have the means to do so?*

This question fails to ask the real question - what can be done to further encourage decarbonisation among those households that have the means to do so. The answer to this is to allow contracting of renewable gases via existing infrastructure, as was allowed for renewable electricity contracting in the early stages of renewable electricity market development.

Consumers who wish to electrify are presently actively investing in this – because, as stated in the question, they have the means to do so. Further financial incentives are not necessary, until and unless the ACT Government intends to force a transition. Consumers should not have to wear the full cost of transitioning to electric appliances and abolishing their gas connections if they do not wish to or cannot do so.

A necessary consequence of the ACT Government's proposal to dismantle the gas network piecemeal is that the cost of the existing gas network will be shared amongst a smaller and smaller share of consumers, many of which who will be the least able to invest in electrification of their households. Allowing consumers to access renewable gas would entirely avoid this consequence.

5. *Is there a role for regulation to support the community when choosing between gas and electric appliances?*
 - a. *How could point of sale information support consumers when replacing appliances or should gas assets be disclosed in a property transaction (sale or rental)?*

The ACT Government proposal to electrify will ultimately result in the stranding of gas infrastructure assets, with associated costs which will be borne both by the ACT Government and consumers. The government should explore providing additional information where possible to ensure consumers can make informed decisions.

6. *Which members of the community are most at risk of being negatively impacted during the transition?*
 - a. *If we were to provide targeted support for low-income households or those who can't transition themselves, what could this be?*
 - b. *What specific actions could the government take to best support these households?*

As noted in the Plan, people who rent and people with low incomes – with considerable overlap between these groups – will be most exposed to the costs of electrification. Their needs would best be met through investment in a renewable gas decarbonisation option that does not require them to go into debt to electrify their homes.

Electrifying complex buildings

7. *How can government work with industry and financiers (such as green finance and investors) to electrify complex buildings?*
 - a. *How can government work with community and community organisations to ensure a smooth transition for those living in complex buildings?*

Regardless of the intentions of the ACT Government are many buildings, like apartment buildings, office buildings and mixed buildings, and other complex infrastructure such as hospitals, where electrification may be functionally impossible, if not financially infeasible. Integrated bulk gas hot water systems and large boiler systems especially may not be able augmented or replaced within the bounds of the existing property, and in some cases may require the demolition of the building.

These buildings would be much more simply converted to renewable gas as an energy source, rather than electrifying.

8. *What should be the role of body corporates in preparing for the transition?*

APGA has no comment on the role of body corporates, other than the above.

Electrifying business

9. *What are the different transition challenges for small to medium business and how could existing programs be improved?*

There will be Territory businesses where electrification is financially or logistically infeasible. The ACT Government will need to consider the role of compensation in these situations. This will include businesses in areas the Government has yet to fully consider – food manufacturing, catering and other hospitality, other manufacturing, all the way to crematoriums.

Electrifying industry and heavy transport

10. *How can we best transition industrial zones and infrastructure, and heavy transport away from fossil fuel energy?*
11. *What are the research and innovation priorities to support business transition and development?*

The Plan states that the ACT Government *will explore the appropriate role for green gas for those industrial applications requiring high grade heat, to ensure we are well positioned to take advantage of solutions as they arise*. The reality is that the Plan will likely leave those industrial consumers behind. Without the economies of scale offered by a gas network, businesses and industrial users may be unable to access renewable gas at reasonable cost even if it is technically permitted by the ACT Government.

To support the needs of industry who require gas, the ACT Government should be pursuing a renewable gas decarbonisation pathway. There is also scope for the ACT Government to investigate the options for hydrogen refuelling infrastructure for heavy vehicles, to link with hydrogen pipelines along the Hume Highway. APGA's submission to the National Electric Vehicle Strategy considers how this might work in practice.⁶

Skills and workforce for the transition

12. *How can we increase the number of skilled workers in electrical trades?*
13. *What opportunities exist for industry wage and work conditions, that could assist with workforce attraction and retention?*
14. *How can we best support gas workers to transition their skills to be part of the net zero economy, for example in electrical trades, sustainable buildings and electric vehicle auto servicing?*

The Plan correctly identifies some of the interrelated workforce challenges of a renewable energy transition that prioritises electrification. The demand for skilled electrical trades will increase, with associated costs, and the ACT Government needs to plan for the long term reskilling of gas fitters and plumbers.

⁶ APGA, 2022, Submission: *National Electric Vehicle Strategy*, https://www.apga.org.au/sites/default/files/uploaded-content/field_f_content_file/221031_apga_submission_to_national_electric_vehicle_strategy_consultation.pdf

A transition from natural gas to renewable gas would not require wholesale reskilling and redeployment of gas workers. It would also ease the demand for skilled electrical workers for whom the ACT will have to compete with other jurisdictions.

Indicators – measuring the gas transition

15. *Which indicator, or indicators, would provide the most meaningful updates on the progress?*
16. *What may be some potential barriers associated with achieving the proposed ranges?*
17. *Are there other indicators that you think would be useful to track the transition as part of the Integrated Energy Plan? For example, electric vehicle adoption or overall Territory emissions reductions.*

It may be relevant for the ACT to also report its emissions factors under the National Greenhouse Energy Reporting Scheme. According to the Clean Energy Regulator, the ACT has a Scope 2 electricity emission factor of 0.73 kg CO₂-e/kWh⁷ in 2022-23, down from 0.79 CO₂-e/kWh in 2021-22.

⁷ Clean Energy Regulator, 2023, *Emissions and Energy Reporting System release 2022-23*, <https://www.cleanenergyregulator.gov.au/OSR/EERS/eers-current-release>