12 August 2019

Jodie Pipkorn

Director, Residential Buildings Team

National Energy Productivity Plan Secretariat

Department of Energy and the Environment

Canberra ACT 2601

Energy Networks Australia's response to the draft report – Trajectory for low energy existing homes.

Dear Ms Pipkorn

Energy Networks Australia welcomes the opportunity to provide this submission regarding energy efficiency measures for existing buildings – Trajectory for low energy existing homes (Report).

Energy Networks Australia is the national industry body representing businesses operating Australia's electricity transmission and distribution and gas distribution networks, with 21 member companies providing more than 16 million electricity and gas connections to almost every home and business across Australia.

This consultation process aims to identify policy opportunities to improve the efficiency of existing homes. The intentions of the policy to save energy, reduce emissions, increase comfort are all credible but realising these benefits requires broad and continued consultation throughout the policy development process.

Our gas distribution businesses manage over five million connections to Australian households and businesses. The gas supplied through these networks provides 44 per cent of the annual energy consumption in Australia's homes. The consumption of gas is not uniform throughout the year with a seasonal peak in winter where gas consumption is approximately triple that of summer's.

To date, the focus of decarbonisation has been on the electricity sector. Over the long-term, gas networks will have their own decarbonisation journey. New fuels, such as biogas and hydrogen, have the potential to become mainstream and complementary energy solutions that will use existing energy infrastructure.

One of the main limitations of the Trajectory project is that it appears to be favouring electrification of gas services, rather than acknowledge the potential of gas infrastructure and the current efforts by industry to decarbonise gas. The electrification conclusion does not appear to consider whole of system costs and ignores the potential upgrades required to support this electrification. In our earlier submission on the Trajectory for new homes, we outlined our concerns, and attach that submission for your reference.

I also note that the Report is considering additional incentives for installing appliances or rooftop solar at properties where this is difficult (e.g. rental homes or apartments). Energy Networks Australia notes that there are a range of ongoing incentives such as the LRET and state-based schemes and does not support additional incentives. Indeed, some businesses have already created products in the market to allow

occupants of those homes to access solar energy, for example, rooftop solar panels can be rented through https://www.solarbeam.com.au/portable-solar-panels-renters or solar energy purchased from a large scale solar farm, as offered by the energy retailer AGL https://www.agl.com.au/solar-renewables/solar-energy.

Recommendations

Energy Networks Australia recommends that:

1. The Trajectory work considers the potential role of gas infrastructure and the decarbonisation of the gas grid instead of assuming that electrification is the preferred option.
2. Energy Networks Australia recommends that if appliances are to be included in scope, the broader energy system costs of the electrification of gas demand should be taken into account. If detailed consideration is not given to total system costs, poor policy decisions are likely to follow.
3. Carry out further assessment to justify introducing any additional incentives to appliances that are commercially available.

We welcome the ongoing opportunity to be involved in the development of the Trajectory and associated policy proposals. If you have any other queries, please contact Dr Dennis R Van Puyvelde, Head of Gas on: dvanpuyvelde@energynetworks.com.au or 02 6272 1548.

Yours sincerely,

Andrew Dillon

CEO

Response to questions in the Report

Chapter 1: Setting the context. Are there any other key facts about the existing building stock that should be included?

Energy Networks Australia supports the trajectory objectives of:

- Lowering energy bills for households
- Save energy (reduce wastage) for the wider economy
- Improve comfort levels for, and potential the health of, occupants;
- Improve resilience to extreme weather and blackout (peak demand); and
- Reduce carbon emissions.

We note some items to be considered in meeting these objectives in our response to Chapter 2 below.

Chapter 2: Understanding the challenge. Are there any other key challenges that should be included?

Inefficient infrastructure investment.

Decarbonising gas could theoretically be achieved through electrification. However, this would further increase the demand on the electricity networks and require even more investment to meet this demand (over and above the increased demand for transport – by growing electric vehicle demand). The seasonal consumption of gas, peaking in winter, would result in a major investment of electricity infrastructure to meet this peak demand. This extra infrastructure to meet the heating peak would only be used for a small part of the year leading to inefficient investment in infrastructure.

A more practical and cheaper alternative is to decarbonise the gas network and to continue using existing gas distribution infrastructure. Many reports have indicated this is a lower cost option, with analysis by the Australian Gas Infrastructure Group and Deloitte Access Economics showing that the decarbonisation of the gas networks in Victoria could be achieved at 40 per cent less cost than the electrification of the gas load.

Other international studies[1] have also shown that the cost of electrification is higher than the cost of decarbonising gas networks. For example:

- A 2016 study by KPMG[2] for the UK found that converting gas networks to hydrogen would have an incremental cost of between £4,500 to £5,000 per household up to 2050 while electrification would cost between £12,000 and £14,000.
- In a 2018 report for the American Gas Association, the average cost of US greenhouse gas emissions reductions through policy-driven residential electrification would range between US$572 and US$802 per metric ton of CO_2 reduced, which is significantly higher than renewable gas which was less than US$100 per metric ton.

[1] https://www.energynetworks.com.au/news/energy-insider/electrify-gas-should-we-or-shouldnt-we
[2] KPMG (2016), *2050 Energy Scenarios – the UK gas networks role in a 2050 whole energy system*

The outcomes from these studies are different from those by pro-electrification lobbyists, such as Renew or ASBEC[3], as they account for overall systems costs resulting from the extra investment required for electrification, which organisations like Renew and ASBEC ignore. A limitation to the Trajectory work appears to be that it favours electrification as a technology option and does not consider the broader systems costs and implications.

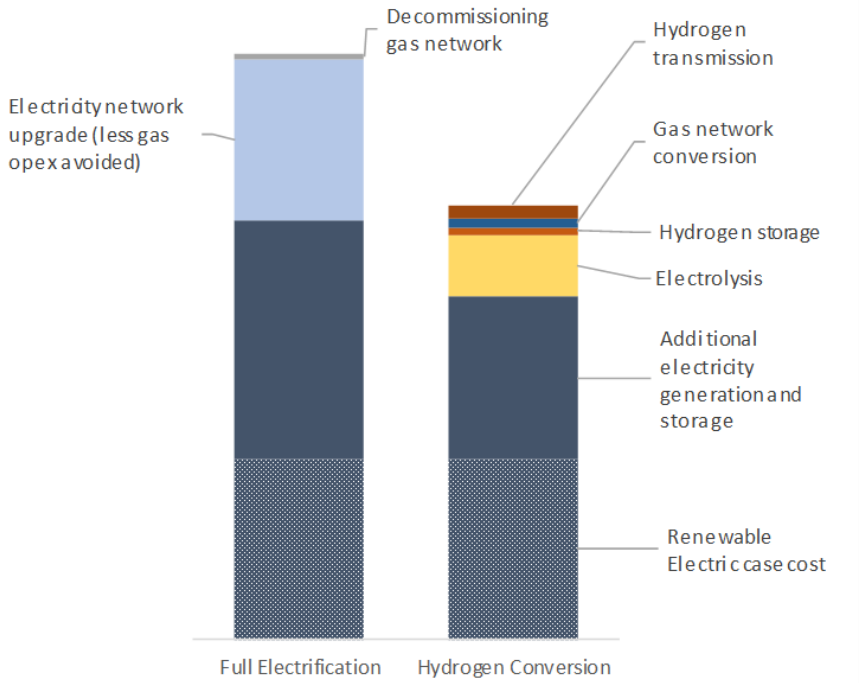

Figure 1: Relative cost comparison of decarbonisation pathways for Victoria (source: AGIG and Deloitte Access Economics Analysis[4])

Value of gas infrastructure

A recent report by Frontier Economics[5] considered the role of gas infrastructure to achieve a climate-neutral Europe. The report considered whether the energy provided by gas could be replaced through electrification for 8 central European countries and the overwhelming conclusion was that this is not practical due to:

- The high level of seasonal energy provided through gas networks is not easily replaceable with electricity;
- Nuclear phase out in Europe requires new electricity generation to replace the retiring nuclear fleet and adding the gas load on top of that would require even more electricity generation;

[3] The Australian Sustainable Built Environment Council
[4] https://www.energynetworks.com.au/news/energy-insider/hydrogen-powered-future-tops-full-electrification
[5] Frontier Economics (2019), *The value of gas infrastructure in a climate-neutral Europe*

- The gas grid has 1,000 times more storage capacity than the electricity network;
- Europe has a wide-ranging and well established gas transportation systems with a capacity greatly exceeding electricity transmission capacity; and
- The electricity transmission challenges of connecting offshore wind power generation to the demand centres.

Frontier found that the annual savings in 2050 from continuing to use the gas infrastructure AND converting to renewable gas would be between UER 29.5 and EUR 48.6 billion.

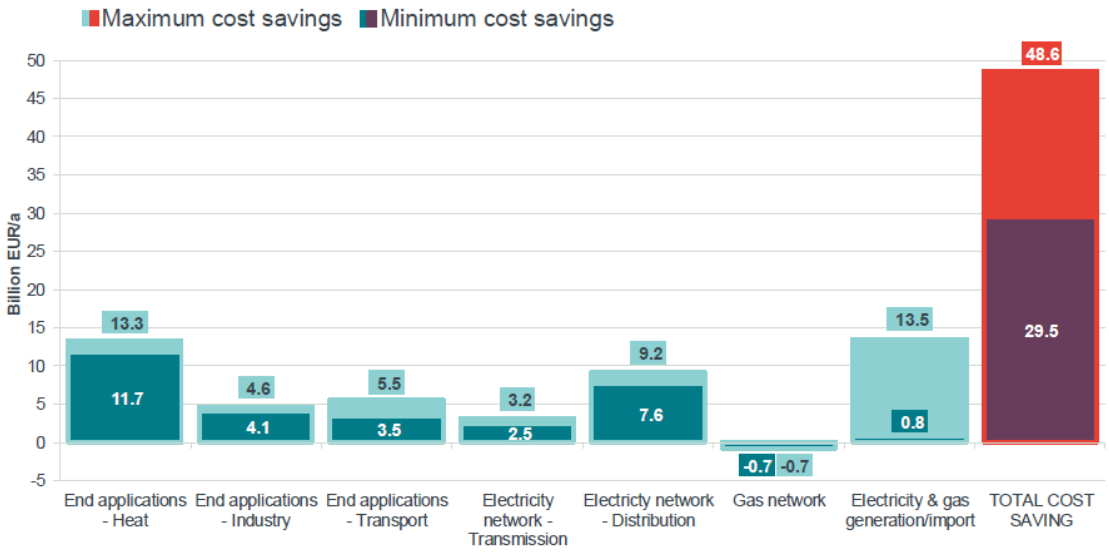

Figure 2: Estimated cost savings of continuing to use gas networks in 2050 in EU (source: Frontier Economics, 2019)

Energy Networks Australia is supporting further work through Future Fuels CRC to better understand the systems impact of decarbonising gas networks. Many previous studies – when considering the whole energy system – all make similar conclusions to the ones made by Frontier Economics. The most economic way to meet climate reduction targets by mid-century is by decarbonising existing gas infrastructure rather than fully electrifying the energy needs which gas currently serves.

Chapter 3: Framing the opportunities. Are there any items that should be removed or included from the scope?

Appliances

The options outlined in this Chapter include the role of appliances in zero energy (and carbon) homes. The use of appliances in the home is very dependent on individual occupants and different occupants will use appliances very differently. For example, some may prefer additional heating in winter and less cooling in summer and as such the energy used in homes clearly differs to reflect these personal preferences.

It is Energy Networks Australia's understanding that a nationally coordinated approach on carbon and energy would be a better mechanism to manage energy usage and greenhouse gas emissions from the

use of appliances in houses. However, Energy Networks Australia understands that it is not straightforward to define a scope for this study and the inclusion of appliances is not an obvious decision.

Energy Networks Australia recommends that if appliances are to be included in scope, the broader energy system costs of the electrification of gas demand should be taken into account to fully capture total costs. If detailed consideration is not given to total system costs, poor policy decisions are likely to follow.

Data gathering

The Report identifies the importance of establishing processes to improve data collection of Australia's building stock. Energy Networks Australia supports establishing these processes and collecting more complete data on residential buildings.

Chapter 4: Understanding our options. Are there any policy instruments that should be removed or excluded?

The Report identifies that additional incentives may be required for energy efficiency improvements to existing homes but does not provide details.

Energy Networks Australia notes that the energy and emissions from the use of appliances is highly dependent on the consumers behaviour. Energy Networks Australia supports the development of a nationally coordinated approach to carbon and emission reductions rather than state-based programs.

Incentives

Home-owners can already purchase a wide range of appliances (for example electric hot water heating, instant gas storage hot water heat pumps). These appliances come at different price points and have differing levels of efficiency. Energy Networks Australia does not support additional incentives for these appliances that are already competitive in the market. For example, the modelling in Appendix D2 shows annual energy and cost savings by using heat pumps compared to traditional appliances but that these appliances have a higher capital cost. Customers can choice which type of appliance would meet their personal needs best and additional incentives do not appear justified. Furthermore, State governments already have a range of incentives in place to support specific technologies.

Access to rooftop PV in rental properties and apartments.

The Report notes that rooftop solar cannot be installed in all properties, for example through split incentives in rental properties, or lack of roof space in apartment buildings. However, there are products available on the market providing access to solar energy for these properties. Some companies make rooftop solar accessible via renting the panels (eg https://www.solarbeam.com.au/portable-solar-panels-renters). Energy retailers are also providing access to solar energy through purchasing a part of a utility scale solar farm (eg https://www.agl.com.au/solar-renewables/solar-energy).

Given the availability of these alternate products, Energy Networks Australia does not support taxpayer funded incentives to subsidise products that are already commercially available.

Chapter 5: Testing feasibility and effectiveness.

No response provided.

Chapter 6: Consolidation and synthesis. What should be the focus areas for the next version of the modelling and report, noting the short timeframes?

Table 11 of the Report outlines additional modelling work to be carried out as part of the Trajectory project.

Energy Networks Australia supports further work being carried out on better understanding the system wide infrastructure requirements as part any proposed energy efficiency process. In particular, the impact of electrifying the gas heating load should be better understood. As noted in our response on Chapter 2, analysis by Deloitte Access Economics and Australian Gas Infrastructure Group showed that electrifying the gas load in Victoria required an extra investment of 40 per cent compared to the option of decarbonising that gas load through hydrogen.

The Trajectory team continues to overlook the potential of renewable gas and Energy Networks Australia recommends that additional work is undertaking to better understand the impacts of electrifying the gas load.