Gas infrastructure in a zero emissions economy

1.

- Do you have any further information, evidence or concerns that you wish to raise in relation to the scenario design and analysis?

The scenario I would like to see analysed and prioritised is Scenario A but with some biomethane for irreplaceable fuel/feedstocks with some CCS and Hydrogen.

This is the gold standard and by far the cheapest for consumers and government. As well as export dollars for surplus Hydrogen.

Scenario A: Zero emissions electrification – no natural gas	Scenario B: Net zero emissions electrification supported by natural gas	Scenario C: Zero emissions hydrogen with biogas and electrification	Scenario D: Net zero emissions hydrogen with biogas and electrification
• Almost full electrification using renewable sources, utility-scale battery storage and some pumped hydroelectric • Very little natural gas except where it is irreplaceable – and none by 2050 • No CCS by 2050	• Extensive electrification with renewable sources, significant small-medium battery storage and limited pumped hydroelectric • Some natural gas to support the renewable electricity system and some industrial uses • Made net zero by CCS and offsets	• Hydrogen using renewable sources really takes off as a substitute for natural gas • Some waste to energy, biogas and renewable electricity sources with some battery storage • No CCS • No natural gas by 2050	• Hydrogen using both renewable sources and coal with CCS • Some waste to energy and biogas and renewable electricity sources with some battery storage • No natural gas by 2050

Not Net zero, will inevitably be some biogas for some processes; therefore		Waste to energy is not zero emissions. A lot of waste is made from petrochemical products; therefore	Waste to energy is not zero emissions, burning it now means emissions now!; therefore

Made net zero by CCS		Made net zero by CCS	Made net zero by CCS
Some Hydrogen.			

There are fundamental reasons why gas is never the best fuel.

- Gas combustion can never be efficient eg. heat is lost in exhaust gases.
- Gas cost can never be offset by renewables (eg. solar)
- Gas can never be without fugitive emissions
- Gas is linked to health problems
- Gas is a finite resource
- Gas is dangerous eg. must have a fowl smelling trace added to try to avoid leaks reaching explosive concentrations in buildings.
- Gas whether in a tank/bottle or distributed needs to be put under pressure, which costs energy.

-

Replacing gas use with electricity will increase demands on the electricity grid

Electrification as a transition pathway from natural gas use will inevitably place additional demands on electricity supply. As households and the commercial sector shift to electricity instead of gas, peak demand in Victoria will likely move from summer to winter, largely due to space heating, and increase by around 40%. When combined with likely increases in demand associated with electric vehicle use, this could place stress on the electricity grid and require additional investment in generation and storage.[133]

The aim is that DER, distributed storage and EVs with V2G capability will act as a big battery to smooth out demand peaks, so the network will not need to be significantly augmented.

2.

- Do you have any further information or evidence that can help identify an optimum scenario for a net zero emissions gas sector in 2050?

The cheapest and most effective method of net zero or better is full electrification. Therefore, the gas distribution system will need to be systematically decommissioned, and the sector reduced to trucked biomethane for irreplaceable fuel use and feedstocks. Hydrogen as a gas sector will flourish for grid support and export, as well as a feedstock eg. fertiliser production.

3.

- What policies and/or regulations, if any, are needed to support the development of low carbon pathways such as biogas, green hydrogen, and carbon capture and storage?

Biogas – few policies/regulations; the technology exists, relatively small amounts will be required for processes that can't do without and for use a feedstock.

Green hydrogen – some policy exists and will need to be strengthened and funded to encourage the expansion of the green hydrogen sector in Australia. Our renewable resources give us a global advantage.

Regulations wouldn't need much revision if we don't bother with piped Hydrogen distribution. The best use of Hydrogen is for electricity generation on the site of production. These Hydrogen production facilities will best be situated near ports for export and where water is abundant.

CCS – Strong policy and funding will be required to incentivise CCS of the type that will be stored long term. It should not be burnt again or used as a feedstock or used to offset emissions from burning fossil fuels. We must rush to draw down the emissions from the last 100 years.

4.

- What is your view on the best ways to maintain the reliability and affordability of Victoria's gas supply if natural gas use declines?

A very systematically staged, well planned out and well communicated decommissioning of the gas distribution network. This way consumers and industry in those areas can get off gas ahead of the disconnection. As gas use declines, the gas supply and gas supply chain will decline equally. Towards the end, gas will be too expensive to entertain, and the final discontinuation will be rapid.

5.

- What else can you tell us about the implications of decarbonisation pathways for the electricity generation, transmission and distribution networks?

Generation; Renewables – Wind and solar are far and away the cheapest forms of generation so will continue to take the largest share.

Hydrogen – Will be an important storage medium for grid support when renewable generation and battery storage is too low.

Hydroelectricity – Only those sites that pass all the environmental hurdles should be used. Damming rivers has many known, and probably unknown negative impacts.

Gas fired power generators – the requirement for gas fired power station is at its peak now and will decline over the next 10-15 years.

Coal fired power generators – are being phased out. The transmission lines into the Latrobe valley will be utilised by offshore wind, onshore wind, solar and grid scale batteries.

Transmission; investment will need to be made to augment transmission to increase capability for renewables to connect and increase connectedness across the NEM. This investment can be made at the same time as existing infrastructure requires maintenance, replacement or to be moved underground.

Distribution; some investment will need to be made to improve the distribution networks capability to carry power in the opposite direction to what it was designed for, mainly substation transformers. This investment can be made at the same times as existing infrastructure requires maintenance or replacement to save costs. Ever increasing DER, DER control, DRE devices and V2G EV's will mean that the size of the distribution cables will not need to be increased as much as previously thought.

6.

- How can the use of Victoria's existing gas infrastructure be optimised during the transition to net zero emissions, over the short (10 years), medium (20 years) and long-term (30+ years)? How can the Victorian Government assist in this?

Should be used only as long as required.

7.

- What principles should apply or what measures will be needed to manage the impacts of gas decarbonisation on households and businesses?

Principles – electrification. It must be well communicated to households and businesses that this is the path being taken, so they and their tradespeople can properly plan ahead. The benefits of using electric appliances powered by renewable electricity are many. With the ever-increasing battery storage on the grid and the distributed nature of generation on the grid, it is much easier to overcome the anxiety of having one energy source, and it no longer make sense to pay for the extra service of gas. If there were 3 million Victorian households paying $1 a day in gas service fees, that is $1,095,000,000 per year in unnecessary fees.

You cannot offset the cost of gas with renewables and storage, like you can electricity.

8.

- What policies, programs and/or regulations should the Victorian Government consider or expand to encourage households, commercial buildings and small businesses to reduce their gas use?

Policies – ban new gas connections. Plan systematic decommissioning of gas network, so people know what's coming.

Programs – education programs to inform people that electric is not only more affordable now, but can be offset with renewable.

Programs to inform small businesses on technologies they can adopt to replace their existing gas ones.

9.

- What policies, regulations or other support, if any, do you think are needed to support industrial users to switch from natural gas to lower emissions energy sources or chemical feedstocks?

Policies - ban new gas connections. Plan systematic decommissioning of gas network from industrial users. Provide some support for gas tank installs if to continue they must use biomethane instead. This will be trucked in.

-

Michael Shaughnessy