

Feedback Towards 2050: Gas Infrastructure in a Zero Emissions Economy

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Firstly, I would like to congratulate Infrastructure Victoria (IV) in looking at possible futures for gas in Victoria and seeking feedback. I have read the Towards 2050 report and viewed the webinar on youtube.

By way of background - I live in Northern Victoria (Mooroopna). I am not a natural gas user, although we do use a large amount of LPG gas as my wife has a small pottery business. I have a science background, and I have followed debate around climate change for over 20 years. Like most thinking people on the planet, I understand the urgent need to reduce carbon emissions and transition to renewables.

In the UK it appears they are well progressed toward a transition from natural gas to hydrogen, initially in Leeds gateway/ H21 project. Japan is also moving in this direction. Closer to home South Australia is progressing toward a hydrogen economy.

In Victoria we need to be taking the same direction and Gas 2050 is a step in the right direction. Your report suggests hydrogen gas and electrification will be the future for Victoria. While brown or blue hydrogen may be important as a transition fuel, in a sun belt country the future is green hydrogen from PV solar.

Scenario 3 – Why not consider Northern Victoria?

In structuring scenario 3 – it is assumed that green hydrogen would be produced from PV solar and electrolysis in Southern Victoria, presumably because its close to the sea. I would like to suggest you also consider Northern Victoria.

- There are extensive saline groundwater reserves – similar to sea water concentration
- Existing disposal basins could be used in conjunction with electrolysis plants
- There are many areas that are suitable for PV installation.
- Recent research suggests grazing and PV solar can coexist, allowing dual purpose land use
- Sunshine hours, and hence PV output will be higher in Northern Victoria
- Land costs are relatively low
- There is proximity to industry for processing of primary produce from farms.

Northern Victoria is well placed for expansion of PV solar. There are large areas of flat marginal land suitable only for grazing (compatible with PV). It will be possible to find flat grazing land suitable for PV solar, within proximity of the existing natural gas pipe network. The existing pipeline infrastructure in Victoria could be repurposed in conjunction with local production of hydrogen/ammonia as an alternative to decommissioning.

Disposal of the concentrated saline water after electrolysis needs to be considered. However, that need not be a problem if PV and electrolysis plants are located close to existing evaporation basins for salt concentration. For instance Girgarre evaporation basin is close to DTS pipeline and would have both access to saline water and disposal facilities. Evaporation basins at Leitchville, Pyramid Hill both about 40m west of Echuca and Tutchewop/Lake Kelly between Kerang and Swan Hill may also be suitable.

If PV solar and green hydrogen in the Northern Victoria is a feasible option, storage as either hydrogen or Ammonia is an alternative to battery storage. The efficiency and economics will change over time. Probably a mix of technologies and locations for green hydrogen production, will be required to provide diversification and spread of risk in an uncertain future. Northern Victoria should be considered as an option.

Natural Gas and LPG

LPG gas provides 25% of industrial . (cant find statistics on household use – but my guess is its similar). Any residence that is not within proximity of a natural gas pipeline will be supplied by LPG. LPG will come under similar transition pressure to natural gas as Victoria seeks to meet future carbon emission targets. It will be counter-productive if natural gas consumers simply switch to LPG. Also I am assuming LPG will become less available, and more expensive as consumers switch to electric vehicles. However, options should consider LPG as well as natural gas use.

Natural Gas Supply to New Subdivisions

Provision of natural gas is a requirement for new subdivision. The smaller scale reticulation is polyethylene plastic – so may be compatible with hydrogen even though the main arterial pipelines are incompatible with hydrogen. If we continue to require natural gas supply as a requirement for new housing subdivision we should also require that the distribution network is hydrogen compatible.

CSIRO have proposed hydrogen can be converted ammonia and conveyed and stored more safely. SA have announced construction of a green hydrogen plant in Whyalla. Ammonia is the preferred solution on farm, as ammonia also has a use as fertiliser, and can be stored safely. It is not clear if the existing natural gas pipeline would be compatible with transmission of ammonia. Is there is an emerging retail market for ammonia, initially for farms?

A possible scenario is subdivisions/residential areas with reticulated hydrogen using centrally located ammonia storage facility at the reticulation hub. Its worth considering the role ammonia will play in the future, and if existing pipe line networks could carry ammonia rather than hydrogen.

Biogas

The report suggests that rural areas have a greater potential for biogas production, and that could be a replacement fuel in rural areas. While biogas may have niche I think the technical basis, challenges and issues around biogas would need to be considered carefully. Farms are likely to make a faster transition to hydrogen fuel. (see below)

Building Consumer Confidence in Hydrogen

Short term, if 10% hydrogen in natural gas pipelines can be accommodated safely that would seem to be a first step toward a hydrogen economy. South Australia are already blending green hydrogen into natural gas pipelines.

Longer term, pilots to establish feasibility and demonstrate safety around hydrogen should be developed, similar to the Leeds Gateway project in the UK.

Transition on Farm

While farms are generally not connected to natural gas, it is worth keeping a watching brief. Farms are better placed to quickly adopt new technology and transition. There is interest in the farming sector in Australia to consider hydrogen as a fuel, probably using ammonia gas as the primary storage. You may be aware of the recent webinar organised by Farmers For Climate Change where the use of hydrogen on farm was explored.

https://youtu.be/JQThUBk_VAg