

# Response to Victoria's Gas Substitution Roadmap

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Submitted by Anthony Fisk July 30, 2021

## Preamble

I wish to thank the Department of Environment, Land, Water and Planning for inviting public submissions on how to transition Victoria's gas sector to zero emissions.

My name is Anthony Fisk, a resident of Glen Iris. While I have no particular expertise in the gas or energy sectors, I do have a science background and have had a keen interest in the effects of global warming for several years. It is with that understanding that I present my responses.

Before answering the questions provided, I think it best to tell you where I think we are, and where we should be going.

## The time for moderate action is past

It is sobering to contemplate just how quickly atmospheric CO<sub>2</sub> levels have risen in recent times. From pre-industrial levels of ~280ppm, they passed the 'safe' level of 350ppm in 1989, and are now at around 420ppm.[1]

**That's a doubling of emissions in the last thirty years.**

Continuing as before will add at least the same amount of CO<sub>2</sub> by 2050.

The effect that a certain increase in atmospheric CO<sub>2</sub> will have on global temperatures has been well understood for a long time. What has been less certain is how rapidly a system the size of the Earth will respond to drivers such as industrial emissions. We can now see that the answer is 'very quickly'. We are now in a climate emergency which the modest measures used to date are doing little to alleviate. There is a set carbon 'budget' for limiting temperature rises to 1.5 and 2 degrees which is being rapidly used up by current industrial practices. The smaller that budget becomes, the more robust the measures to reduce emissions will have to be.[2]

**For these reasons, I will be advocating for actions that are swift and bold. This may seem reckless but, unfortunately, these are now the only effective options available. The truly reckless path is moderation.**

## There's no reason to hold back

It's not all bad news. While this crisis is developing at speed, the solutions available are also widening. Renewables are not only proven technologies, their costs are decreasing rapidly. This should be borne in mind when forming Government policy. Forget what studies of even two years ago might say. Solar power is now the cheapest form of energy available, and it's continuing to get cheaper.[3][10]

In the final analysis, our ability to respond is limited, not by technology, but by imagination and political will. The cost to the existing economy is often cited as a reason for inaction.

However, **the cost of inaction has been calculated as being ten times greater than action.**[4]

## My responses

I will present my responses in the order given, starting with the questions given online. As I mentioned, my expertise is not deep, so my answers are not detailed. However, they are intended to provide a fresh perspective, and to draw from references that may be of interest to you.

## Online Questions

*What are the opportunities and challenges for Victoria to decarbonise the gas sector and achieve Victoria's emissions reduction targets?*

Opportunities:

- Efficiency improvements via home insulation and monitored electricity use.
- Health improvements. Domestic gas use is a significant cause of childhood asthma.[5]
- Renewable energy sources add to local economies.
- Seaweed additive to cattle feed, that reduces methane reflux.[6]
- Disallow new gas connections. Domestic gas accounts for 60% of demand, so this would place a significant limit on future gas requirements.

Challenges:

- Vested interests. Predatory delay is a tactic still being successfully employed by fossil fuel cartels.
- An increasingly disruptive environment. Actions considered bold even a decade ago are no longer sufficient. Actions considered outrageous now may be deemed inadequate in five years. Whatever pathways are adopted will need to be regularly assessed with this in mind.
- Meeting the promise. While a lot of renewable and sequestration ideas promise much, the reality might disappoint. While I don't think this is the case with renewables, soil sequestration may not be so beneficial.
- Meeting targets. Regular monitoring and consistent interpretation of data needs to be employed.
- Resistance to change. If people are used to doing things one way, they may need a lot of persuasion to alter behaviour. It is best to allow them to conclude the change is in their best interests in their own time, but time is not on our side.

*What should be the priorities of the Victorian Government to support the transition to reach net zero emissions?*

Based on effort required, I would order the listed priorities as follows:

1. *Supporting vulnerable communities*
2. *Protecting Victorian jobs and providing new training and employment opportunities*
3. *Supporting technology innovation and investment*
4. *Ensuring energy prices remain affordable*
5. *Balancing all of the above*

*Please explain your choice of order*

NB: I prioritised by what I thought to be areas of Government investment rather than overall importance. Thus, affordable energy prices is important, but isn't going to need much effort. To achieve.

The transition away from gas and other fossil fuels will need to be rapid: far more rapid than the 2050 timeline suggests. A more rapid transition is quite achievable, but it will involve a substantial amount of change and therein lies a problem. Most people find change to be stressful as it represents something beyond their control. Therefore it is essential that people feel they do retain some control. In part, the popular uptake in rooftop solar is precisely because it does give people that sense of control. The Government should provide support to foster this sense, particularly where it comes to reskilling and lifestyle adjustments. Forecast well in advance when a particular industry is going to be shelved.

Encouraging innovation is important, but I think most of the biggest technological innovations required to bring about the transition away from gas have already occurred. I don't see them requiring a particularly large contribution from the Government to develop, apart from encouraging deployment.

By the same token, nothing I've seen to date suggests that energy prices are going to increase as a result of transitioning to renewables. Quite the opposite, in fact, as solar power is now the cheapest source of energy, and cost is still falling rapidly. The energy sector needs no persuasion in moving to renewable energy. It only needs some Government encouragement to proceed at speed.

'Balancing all of the above' is something to be done if you can't decide what option is best: a cop out.

*What do you see as the best opportunity for you to play your part in this transition?*

As an individual my influence is limited, and I do not have any particular expertise, beyond general knowledge. Possibly as a provider of thinking points, as with this submission? (I hope that some are refreshing)

## Pathways

### Improving energy efficiency

This is a very good option overall. There is a significant scope to improve insulation of housing. Not only does improving efficiency reduce energy costs to the consumer up front, it reduces the demand placed on replacement energy sources, which takes the pressure off as they scale up and fossil fuels scale down.

The main thing to consider is that it is not a blanket solution: it puts the onus on many individuals to act in their best interests, and will likely require encouragement to make adjustments to their home if it is to have an overall impact.

The question of setting up an equitable housing efficiency program has been investigated in depth in the Million Jobs Plan.[7] One initiative it mentions is 'Energiesprong', a European firm who provides housing 'makeovers' using a financing model similar to mobile phone plans.[8]

### Electrification

All domestic gas appliances have effective electrical equivalents which should be encouraged from the outset. That being the case, it has to be asked whether homes require gas at all.

The assumption here is that electricity can be readily provided by renewable energy. A counter-argument might be that, in the short term, you are replacing gas with brown coal power stations, which have substantially higher CO2 emissions (not to mention other pollutants). This is not necessarily so. Fugitive gas emissions are a significant issue since unburned gas (methane) is a much more potent (80x) greenhouse gas than CO2.[9] A 30% reduction in CO2 is more than offset by 0.5% methane gas leakage.

**One thing that I think the State Government should seriously consider is legislation prohibiting gas connections to new homes.** This will put a cap on overall gas demand, and reduce future transition efforts. Possible downsides are the effect it will have on gas plumbers, and gas company revenue. Oh, and change...

### Substituting Natural Gas with Hydrogen

Hydrogen has been spoken of a lot recently, in various colours depending on how it is sourced.

**Before proceeding further, it should be emphasised that the \*only\* viable form is green hydrogen, produced using renewable energy.** To understand why, think of the production of hydrogen gas as a form of energy storage. Fossil fuels are also a form of energy storage, so using them to generate hydrogen equates to transferring energy from one storage medium to another. The physical laws of entropy state that this is a far from 100% efficient process; meaning you'd be better off using the fossil fuels directly. Which defeats the purpose.

Even green hydrogen is a dubious gas grid option for anything but the short term. As already stated, there is no underlying reason why the domestic energy market needs gas rather than electricity. The transition plan should be considered as an opportunity to wind up an obsolete infrastructure.

The effect that hydrogen would have on existing gas pipes would be of less concern if it were being considered as a short term option. The question then becomes just \*how\* short a term?

While I'm not convinced that hydrogen should be deployed in the grid, it \*does\* have possibilities in the long haul transport and export sectors, where direct electrification is not available.

### Substituting Natural Gas with Biogas

This is methane by another name. Using it in the gas grid is feasible but, if we want to shut down the gas grid as quickly as possible, generating electricity from biogas at source is preferable.

That said, one possible benefit to using biogas is that gas wells could be shut down more quickly, and fugitive emissions from them dealt with.

How do 'circular economy' initiatives effect biogas production in the longer term?

### Net Zero Emissions

The idea of offsetting carbon emissions with carbon sinks like revegetation projects does hold some appeal, especially in the early stages of climate action. However, given the scale of drawdown that is now necessary, it is of limited use, and has been subject to 'double-dipping' and other disreputable accounting tricks.

If employed, emissions need to be closely monitored, and carefully marked against offsets. It should not be relied on to produce the desired outcome of zero emissions.

### Conclusion

Of the pathways described, there are three are worth considering seriously, which may be pursued simultaneously:

1. Improving energy efficiency
2. Electrification
3. Net zero emissions

Substituting natural gas with hydrogen or biofuel (other than transport) has some short term benefits, but are dead-end policies that ultimately delay the goal of eliminating gas.

## Response to Key Issues

### Issue 1: Maintaining electricity reliability with new sources of demand

*What policies are needed to ensure that the electricity network can reliably serve new sources of demand from hydrogen production, electric vehicles and electrification of gas demand?*

As Victoria transitions away from gas to electricity, the electricity network should continue to be reliable. Ensuring this has three aspects:

- Being able to meet the overall demand for electricity as it increases,
- matching supply to demand,
- maintaining stability as more diverse energy sources such as rooftop solar come online.

*What is the role for gas-fired power generation and hydrogen in maintaining electricity reliability?*

In recent years it has been the reliability of coal powered stations that has been the issue in maintaining power, not the uptake of renewables. Gas fired turbines are able to provide a rapid power ramp-up, but battery storage has been found to be even quicker.

### Issue 2: Transitioning to more sustainable gaseous fuels with minimal disruption to end-users

NB: I consider this is a dead issue as I do not think this policy should be pursued (see previous discussion in Pathways).

*What are the key technical challenges in converting existing gas networks to accommodate more sustainable gaseous fuels?*

For hydrogen, Replacing copper tubing

*What are the potential costs and opportunities in switching to more sustainable gaseous fuels for consumers?*

I think gas in any form is yesterday's fuel since all home gas appliances have effective electrical equivalents. Legislate to prevent all new dwellings from connecting to gas. This will place a cap on future gas demand.

### Issue 3: Maintaining the reliability, affordability and safety of gas supply

*What are the affordability, reliability and safety considerations related to gas supply and gas infrastructure, both in the short term and during a long-term transition to a decarbonised gas sector?*

*What policies are needed to ensure that the gas system continues to operate reliably and safely and remain affordable for end-users during this transition?*

A recent report states that renewable energy in Europe is now half the cost of fossil fuels. Australia is far better placed to make use of renewables, so I don't think increased costs to the consumer will be a problem.[10]

#### **Issue 4: Supporting Victoria's workforce, industry and the institutions that support them**

*What workforce skills and industry capabilities are required to transition to new and emerging energy sources?*

Necessary skills need to be identified and support provided to reskill. Change is stressful and, without security, resistance to change is likely to be high. There should be no indication that reskilling is downskilling.

*How can government, industry and unions best work together, including through the Victorian TAFE and Training system, to help to build these skills and capabilities, and support existing workers through the transition?*

Clear communication with open goals. Do not allow the transition to become politicised. At least, any more than it already is.

*How do we maximise local job opportunities, including for industry training centres such as that operated by the Plumbing Industry Climate Action Centre, to prepare workers for the future?*

Solar and wind farms are much more community friendly than coal mines or gas fields (which are often located in remote regions) They employ more people, too.[11][12]

#### **Issue 5: Managing uncertainty in the transition**

*What key uncertainties should the Roadmap take into account, and what is the government's role in reducing these uncertainties?*

The transition away from fossil fuels to renewables is inevitable. The key uncertainty at present is how supportive the various levels of Government are likely to be over this period. Unfortunately, the Federal Government is clearly not. It continues to press for a post-Covid gas led recovery, despite pleas from a wide section of the community, business, energy providers, even the international community.

## Issue 6: Transitioning the Victorian economy efficiently and equitably

*How can we ensure that the costs of transition to lower emissions energy sources are borne equitably?*

Making the transition available to all. (vague, but re-emphasising the need for support.)

*How can we help low-income and vulnerable households manage any upfront costs in changing energy sources?*

The Energiesprong model is one possibility.

*What are the barriers for households in improving the efficiency of their use of gas for heating, cooking and hot water and/or switching to solar/pump hot water in existing homes?*

Rental and body corporates. High rise reduces opportunities for rooftop solar. Sheer force of habit, even when given a more beneficial opportunity, should not be underestimated.

*What are the opportunities for the Victorian Energy Upgrades program to incentivise efficient gas use, thermal upgrades of buildings (e.g. insulation) and electrification?*

Legislate to disallow gas connections for all new dwellings. Doubtless actual legislation would not be as simple as that sentence, but it would stop the growth of gas usage.

*What issues and elements do you see as most important to improve the energy and emissions performance of new homes?*

Insulation. Energy storage. Control by homeowners.

## References

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