

Victorias' Gas Substitution Roadmap

Submission by Chris Goodman

I am making this submission on the gas roadmap as an engineer and citizen who has been engaged with energy efficiency and climate change more generally for many years.

I welcome the initiative to establish a road map. I have some concerns.

Vested Interests

My fear is that each step along the way will need to push against vested interests, as well as public inertia and disinterest.

I recall several years ago the current Victorian Government proposed to raise the minimum standard of gas hot water systems to 5 stars. A couple of gas hot water system manufacturers got together with a small campaign, the gist of their message was that Victoria could only make less efficient heaters and five-star heaters were all imported.

JOBS WOULD BE LOST, screamed the headlines. It was reported that we did not have the manufacturing capability, not that we had a higher cost base. The government folded and shelved the plan.

We should not subsidize or protect inefficient and uncompetitive manufacturing. The manufacturers are not evil fossil fuel companies, just companies protecting their small share of profit in a bad system. It would make sense to support them in the short term to achieve world-class five-star electric products.

Special Interest Lobby Groups are pervasive in the Gas Industry.

A key question for the road map (and for democracy in general) is how to withstand the pernicious and pervasive force of lobby groups.

A related issue is how the many regulators in the gas sector can avoid regulatory capture by fossil fuel interests that will say one thing publicly but privately lobby decision makers at all levels to make decisions that will slowdown the transition.

Another issue will be public inertia.

I renovated a house in 2001. I used some but not all the latest sustainability techniques. Sadly, the builder and architect talked me out of most of my ideas like double glazing.

It took me 20 years and a pandemic to get around to installing solar panels and a water tank. I recently had most of the halogen lamps replaced by a Victoria Energy Upgrade provider. They couldn't replace the dimmable ones so I will do that myself.

Last year the gas ducted heater broke. I could not replace it with electric as my ducting was not wide enough. Also, the economics still didn't stack up.

With an infrared camera you can see where the heat escapes. But few people know how to make one or how to use it.

I give these examples of my own experience to show how complex home efficiency upgrades are. The home insulation scheme was another case that showed this is hard to scale up.

It is much easier to build an efficient house than to make an inefficient house perform.

CHANGE THE BUILDING CODES IMMEDIATELY

It is a tragedy that we did not have the courage to do this 20 years ago. Hundreds of thousands of homes would have provided comfort and lower emissions?

Houses should last a lifetime. The emissions in construction are high.

Builders should be required to demonstrate the insulation is installed correctly before the cladding and or lining is completed. Building inspectors should be trained to understand correct installation of insulation. Often insulation is slapped in quickly then covered up. No one gives it any thought. So, some incentive or regulation is required to achieve adequately performing insulation such as a thermal insulation test prior to occupancy.

We train builders, electricians and plumbers and regulate their work. We need to train insulation installers as a specialist skill.

Hot Water Services

At three percent of emissions, this is low hanging fruit. Most people do not care about how their water is heated, so long as it is reliable and not too expensive. A HWS can also be supplemented with a direct solar heat exchanger reducing load on the electricity system. A storage HWS works like a battery. Electric systems can store hot water when there is capacity.

It is not yet economic to just change a gas HWS to electric unless you have solar installed. It takes an event to initiate a changeover.

To promote electric HWS, the solar rebate could be extended to include an electric HWS incentive. That is one time when people would consider a new system.

The other time is when your existing system breaks. Whether you are the owner or a renter, you need a new system - fast. You probably didn't plan for it in your cash flow analysis and there is not a building project that it fits within.

It is faster and cheaper to install a gas system. How can we change this dynamic?

One measure is to increase the minimum standards as the government proposed to do earlier. This will stop landlords inflicting expensive inefficient systems on vulnerable tenants.

The next measure could be to make it cheaper to buy an electric heat pump storage HWS. Perhaps with a subsidy in the short term. The plumbing suppliers would need to be educated first to offer this option.

Even if the new electric and new gas units cost the same, there would still be some installation issues such as where to place storage tanks, power supply etc. It is always easier to replace like for like. Solar hot water is even more costly and complex to retrofit than a purely electric system. Melbourne solar HWS usually require backup.

Without strong interventions, the transition to electric hot water will take a long time.

Fugitive Emissions

Unburnt gas is 27 times more potent than burnt gas as a GHG. Fugitive emissions help no one and add nothing to the economy. This is low hanging fruit that should be prioritized.

The gas producers and distributors seem to have little incentive to fix the issue.

Relatively recent technology allows us to video methane emissions. This can help audit emissions at the source.

Methane detection devices can also be fitted to a vehicle or fleet of vehicles equipped with a GPS. For example, Google Street View vehicles traverse almost every street in Victoria at least once every two years. Drones can also be deployed to detect emission sources.

It is possible to automate the creation of very precise, extensive, and up-to-date maps of fugitive emissions in the State.

Victoria could adopt a zero-tolerance policy to fugitive emissions, enforcing the responsible emitter to fix the issue. Alternatively, using the model for renewable energy (RETS) third parties could be paid carbon credits for detecting and fixing the problems in the distribution network.

Hydrogen

Importing gas to Australia, an energy superpower, makes no sense.

If 10% hydrogen does not require changes to the distribution and appliances, then the roadmap should call for a ramp up to min 10% Green Hydrogen within 10 years. This will also help to establish the hydrogen industry. But let's be realistic that this is the limit.

Carbon Capture and Storage has not been demonstrated as economic after 30 years so only Green Hydrogen from renewables should be supported. Gas from Coal is a non-starter.

As higher concentrations require changes to appliances then the public is not ready for this. Pilots could be done in those towns where gas is already trucked in to test the system and see how costly a transition would be. This could be as difficult a problem as upgrading hot water. Is it even realistic?

Only once the gas runs out, will people be ready to change. It is hard to envisage a complete conversion to hydrogen in the Victorian Gas Network. Electrification may be easier and more efficient. Hydrogen may be promoted to slow down electrification, even when the use case is known to be uneconomic. See [Oil Companies Know Hydrogen Is A Dead End, But It's A Handy Way To Hold Back Electrification | CleanTechnica](#)

Hydrogen – demand side merit order by sector



HYDROGEN Use Cases



Source: Michael Liebreich/Liebreich Associates Concept: Adrian Hiel/Energy Cities

Sincerely,

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