

Submission on Victorian Gas Transition Roadmap

Introduction

I am an environment graduate from Monash University that included an internship with DELWP. I write this submission as a concerned citizen that wants urgent climate action to decarbonise the Australian economy. Australia needs to keep faith with its Paris Commitment of 1.5°C for the sake of future generations and to mitigate both current and future climate risk. Professor Will Steffen says we must halve global emissions this decade and reach net zero emissions by 2040 otherwise Australia is at great risks including hugely growing economic, environmental and social costs.¹

As shown in Table 1, gas is fossil methane, a greenhouse gas that equates to coal in its global heating impact when used for electricity generation, (which releases carbon dioxide). It also produces system-wide leaks and venting of methane which is 86 times more harmful than carbon dioxide over a 20-year period.

Table 1: Global warming potential of methane relative to carbon dioxide. This table shows the relative shift in the energy balance of the atmosphere from the emission of one tonne of methane relative to one tonne of carbon dioxide. Sources: Myhre et al (2013) and Etminan et al (2016).

	Time horizon	Default value (IPCC AR5)	Carbon cycle feedback	After Etminan et al. (2016) revision
Fossil methane	20 years	85	87	99
	100 years	30	36	40
Biogenic methane	20 years	84	86	98
	100 years	28*	34	38

Source: Climate Council, 2020

No onshore gas exploration or plants

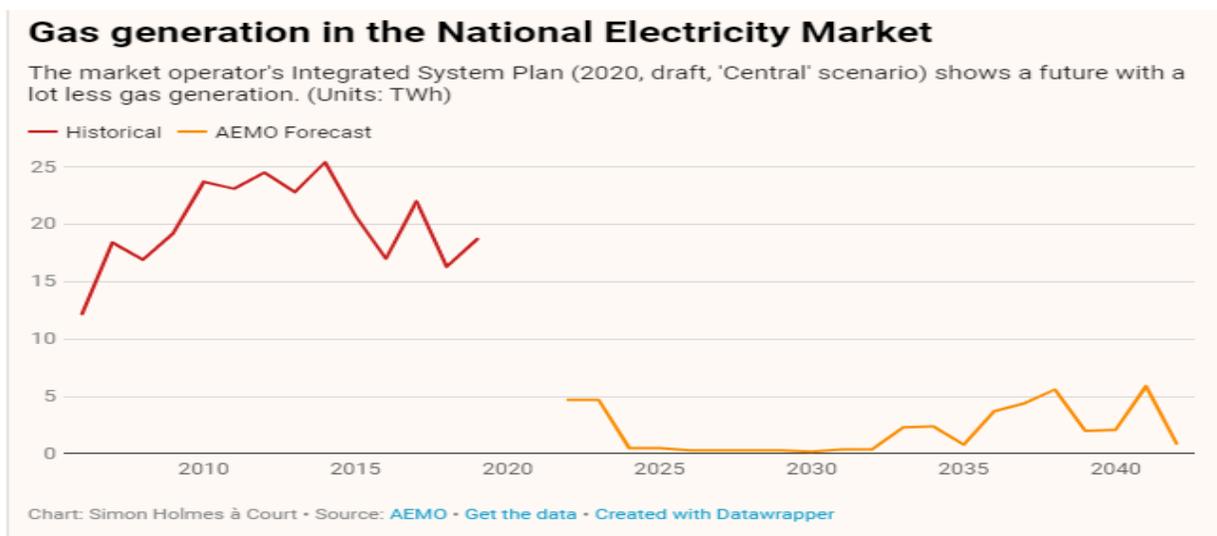
Currently the Victorian Government has authorized onshore gas exploration from July 2021.² However, there should be no further onshore or offshore exploration of gas nor build of new plants. The IEA (2021) says “As of this year, no new oil, gas and coal investments are needed if we want to reach our

¹ <https://www.climatecouncil.org.au/wp-content/uploads/2021/01/hitting-home-report-V7-210122.pdf>

² <https://www.abc.net.au/news/2020-03-17/victoria-lifts-ban-on-onshore-gas-exploration-but-bans-fracking/12063196>

targets.”³ The Victorian government needs to abandon these plans in the Otway basin and elsewhere. Locking in gas infrastructure for 20-30 years does not make sense in the context of addressing a climate crisis.⁴ Increasing the supply of gas in the world will increase emissions and so should not be considered let alone supported using taxpayer funds. The environmental impact of gas is significantly understated⁵ due to industry measurement practices that are poorly overseen by government regulators.

There is no support for gas expansion or underwriting from the scientific community and economic experts. “No new gas is required”, (Climate Council, 2021)⁶ and especially no new infrastructure such as pipelines or any other plants. AEMO has forecast that gas will decrease in demand over the next 20 years and in its central scenario will have renewables capturing 76% of the grid by 2040.⁷ Refer next chart regarding the NEM.



Source: Chart: Simon Holmes à Court, Data: AEMO⁸

³ <https://www.smh.com.au/world/europe/top-energy-chief-tells-australia-to-get-to-net-zero-emissions-before-2050-20210517-p57sq7.html?fb%20clid=IwAR1AmOC4p5WhD1Nb5StDa7Qomy2dUWXjsPRZz1BYJq7J00vyT7Nkuu-bQE8>

⁴ <https://theconversation.com/scott-morrison-s-gas-transition-plan-is-a-dangerous-road-to-nowhere-130951>

⁵ <https://www.climatecouncil.org.au/resources/why-is-gas-bad-for-climate-change-and-energy-prices/>

⁶ <https://www.climatecouncil.org.au/resources/national-gas-infrastructure-plan-pipelines/>

⁷ <https://www.smh.com.au/environment/climate-change/why-fracking-narrabri-is-no-solution-for-cheaper-energy-or-cutting-emissions-20200206-p53yeh.html>

⁸ <https://www.theguardian.com/commentisfree/2020/feb/01/scott-morrison-is-stuck-in-a-time-warp-more-gas-is-not-the-answer>

AEMO is satisfied that renewables can dominate electricity generation without any new gas power plants.⁹ Gas is bad for the physical environment with forests cleared for access roads and well heads. Further, domestic gas prices have increased substantively¹⁰ so the sooner demand is reduced, the better Victoria will be. Any transition away from gas that will result in both emissions reduction and cost savings.

Gas is not required for electricity or grid management

Renewable generation with storage is generally cheaper than gas or coal plants.¹¹ Battery systems now compete with gas peaking plants and can do their role. The Climate Council states one gas-powered generation technology – combined cycle gas turbines are unsuitable for a future grid¹² and even unreliable.¹³ Therefore, we do not need gas peaking plants and exiting gas peaking plants can be replaced by renewable energy and battery systems. Other technologies such as virtual power plants (VPP), demand management and digitalisation have future roles in managing the grid rather than gas plants. Existing technologies for pumped hydro and large scale are already implemented.

Professor Ross Garnaut in The Australia Institute webinar 24-02-2021 stated that gas is not required for expanding the economy. Recovery can be met by a clean economy and provides the potential for Australia to become a superpower.¹⁴ Meanwhile jobs in the gas industry are shrinking. The ABS shows a contraction of gas industry jobs in 2020 by 10.5% more so than the rest of industry at 1.7%.¹⁵ Gas workers, therefore need to be transitioned to offshore wind or other renewable industries. The Global Wind Energy Council (GWEC) says that jobs are available for oil, marine and gas engineers disrupted by energy transition.¹⁶ A transition plan in conjunction with industry for workers needs to be created.

⁹ <https://www.climatecouncil.org.au/resources/aemo-no-gas-shortfall/>

¹⁰ https://www.climatecouncil.org.au/wp-content/uploads/2020/12/FINAL-CC_MVSA0245-CC-Report-Gas_V5-FA_Low_Res_Single_Pages.pdf

¹¹ Ibid

¹² Ibid

¹³ <https://www.climatecouncil.org.au/wp-content/uploads/2021/06/Kurri-kurri-sub-1-June-FINAL.pdf>

¹⁴ Garnaut, R. 2019 Superpower: Australia's Low-Carbon Opportunity and 2020 Reset: Restoring Australia after the Pandemic Recession

¹⁵ <https://australiainstitute.org.au/wp-content/uploads/2021/02/P1012-Gas-job-cuts-WEB.pdf>

¹⁶ GWEC report - wind industry job opportunities - April 2021 <https://gwec.net/wp-content/uploads/2021/04/Job-Note-April-2021-2.pdf>

Residential

My own residence has converted from gas to only electric appliances, and heating. Social media group, My Efficient Electric Home can be referenced to assist consumers to get off gas.¹⁷

Gas is bad for our health when used in homes.¹⁸ Its consumption in poorly maintained or un-flued appliances releases pollutants including deadly carbon monoxide and nitrous oxides, which can exacerbate respiratory conditions including childhood asthma.¹⁹ Gas will not support a sustainable future for households.

The current low-income subsidies for households should increase. In addition, more subsidies could scale according to income to encourage more Victorians to cut over appliances and space heating to cleaner alternatives.

Policies including subsidies should be directed at:

1. Prioritising space heating with split system air conditioners.
2. Replacing gas hot water systems with heat pumps.
3. Continuing the Solar Homes program to encourage cleaner solar electricity and batteries.
4. Appliance switching incentives from gas ovens and cooktops to induction and/or electric.
5. Supporting building efficiency standards including appliance ratings, insulation, and draught sealing.
6. Providing incentives for suppliers and retailers to market electric products over gas.
7. Mandating new estates or house retrofits cutover to electrics.

¹⁷ <https://www.facebook.com/groups/MyEfficientElectricHome/>

¹⁸ <https://www.climatecouncil.org.au/wp-content/uploads/2021/05/Kicking-the-Gas-Habit-How-Gas-is-Harming-our-Health.pdf>

¹⁹ <https://www.nationalasthma.org.au/living-with-asthma/resources/patients-carers/factsheets/gas-stoves-and-asthma-in-children#:~:text=How%20does%20gas%20combustion%20lead,and%20may%20worsen%20asthma%20symptoms.>

No gas blending

Electrification eliminates the need for blended hydrogen and gas solutions. It is to be noted that blended hydrogen into the gas pipes would be limited by the pipe material and the need for burner replacement of cooktops. Only, 10% of blending is proposed for 2030²⁰ which is too slow as a decarbonization solution with no promise of fulfilling 100% hydrogen in the pipes by 2040. Maintaining, 90% fossil gas in pipes for a longer period means more health issues from gas fumes, especially in the home. The blended plan has been suggested as “greenwashing” as it has been proposed by those who own the current infrastructure and would not benefit from electrification or other competing technologies.²¹

Green hydrogen not blue

Blue Hydrogen made from gas with CCS more often only captures around 90% in steam methane reforming and has leak risks throughout its supply chain.²² Whereas, green hydrogen made from renewable energy does have a potential role for seasonal grid storage and in the production of ammonia, and feedstock electricity for steel, aluminum, and cement.²³ Green hydrogen could be used to produce FCEV for heavy vehicles in Victoria and for export.²⁴ I do not support hydrogen from brown coal trialed in the HESC project, but the supply chain learning can be transplanted for green hydrogen supply chains. Instead support green hydrogen applications or electric solutions and energy efficiency. The hydrogen industry is another opportunity for gas workers to move to.

²⁰ <https://arena.gov.au/blog/role-for-renewable-gas-in-our-homes/>

²¹ <https://thefifthstate.com.au/columns/spinifex/hydrogen-in-the-gas-grid-is-a-great-idea-if-you-own-the-gas-grid/>

²² <https://www.rechargenews.com/energy-transition/upstream-emissions-risk-killing-the-concept-of-blue-hydrogen-says-equinor-vice-president/2-1-1040583>

²³ https://www.energy.vic.gov.au/__data/assets/pdf_file/0021/513345/Victorian-Renewable-Hydrogen-Industry-Development-Plan.pdf

²⁴ As an aside, I worked on the Renewable Hydrogen Industry Development Plan as part of my DELWP internship in 2021.

Industry

Manufacturing and other gas users can be supported by:

1. Heat pumps for water that are more efficient than gas.²⁵ Beyond Zero Emissions (BZE) found that the payback period for heat pumps that replaced 2MW gas boilers was 2 years.²⁶
2. Utilizing technologies such as compressed air, process efficiency, digitalisation. Refer AE2P for specific tailored recommendations.²⁷
3. Energy efficiency. Refer Energy Efficiency Council for specific recommendations.²⁸
4. Tailoring solutions to application.
5. Support carbon trading schemes and price at the federal level.

Refer Table 1 on process heat.

Table 1. Process heat supplied by fossil gas in manufacturing and renewable energy alternatives

Process heat level used in manufacturing	Less than 250°C	250°C to 1300°C	Greater than 1300°C
Share of total process heat requirement (33)	9%	45%	47%
Applicable renewable energy technologies for process heat generation			
Electric heat pump – air source	yes		
Electric heat pump – ground source (geothermal)	yes		
Geothermal - direct	yes		
Biomass combustion	yes	yes	
Biogas combustion	yes	yes	yes
Solar thermal - direct	yes	yes	yes

Source: <https://australiainstitute.org.au/wp-content/uploads/2020/12/UoMEI-Switching-off-gas-FINAL.pdf>

BZE has provided guide: *Zero Carbon Industry Plan: Electrifying Industry* and is summarised in Table 2 and Table 3.²⁹

²⁵ <https://australiainstitute.org.au/wp-content/uploads/2020/12/P908-Gas-fired-backfire-web.pdf>

²⁶ Ibid

²⁷ <https://www.a2ep.org.au/our-work>

²⁸ <https://www.eec.org.au/>

²⁹ <https://bze.org.au/wp-content/uploads/2020/12/electrifying-industry-bze-report-2018.pdf>

Table 2 BZE Electrifying the manufacturing state

TECHNOLOGY	TEMPERATURE	WORKS BY...	CAN MAKE...
 Industrial heat pumps	up to 160°C	using electricity to extract thermal energy from one place and transferring it to another	chemicals, food and drink, pulp, paper and wood
 Electromagnetic heating	up to 2,000°C	using the electromagnetic spectrum to deliver heat. Eg, infrared, induction and microwaves	food and drink, pulp, paper and wood, fabricated metal and machinery, ceramics and chemicals
 Electrical resistance	up to 1,800°C	passing an electrical current through a resistive heating element like a metal bar	cement, glass and ceramics, iron and steel chemicals
 Electric arc heating	up to 5,000°C	using electricity to melt metal (electric arc) passing a powerful electric current through certain gases like argon (plasma arc)	iron and steel, cement and ceramics
 Renewable hydrogen	n/a	passing an electrical current through water (an indirect route to electrification)	chemicals (like ammonia) and steel

Source: <https://bze.org.au/wp-content/uploads/2020/12/Electrifying-The-Manufacturing-State.pdf>

Table 3 Summary of technologies

Product	Electrical heating technology
Prepared food	Heat pumps and infrared
Beer	Heat pumps
Milk powder	Heat pumps
Paper	Infrared
Aluminium casting	Induction
Brick	Microwaves
Glass	Electrical resistance
Plastic	Electrical resistance
Steel	Renewable hydrogen and electric arc furnace
Ammonia	Renewable hydrogen

No native forest biomass from LPG

There should be no biomass combustion from native forests. A case example of a failed transition is the Beaufort hospital that was converted from LPG to use woodchips from the local Mt Cole forests, an area now proposed for a national park.³⁰ Instead, we need to protect our biodiversity, carbon store and ecosystem services of the native forests. Alternatives include technologies already discussed or only non-native forest bioenergy.

Harvesting trial in Mt Cole State forest



In November 2014, VicForests took over responsibility for managing small scale timber harvesting licences in Victoria.

The licences were previously managed by the Department of Environment and Primary Industries' Forestry Services Unit and include a number of licencees based in the west of the State.

One area where licencees are currently operating is the Mt Cole State forest, to the north of Beaufort.

Mt Cole State forest contains about 3600 hectares of forest which is available for timber production as has traditionally been an important local source of timber with support from the local community

including the Friends of Mt Cole.

The sustainable harvest level for this forest is 1500m³ of D+ sawlog per year with VicForests licencees currently harvesting around 1000 m³.

Sawlog is being supplied to Pyrenees Timbers at Chute to produce kiln dried timber for flooring, decking and green sawn timber for construction. The waste is used to generate heat for their drying kiln and they also provide dry wood chips to the bioenergy heater at the Beaufort hospital. ←

Residual timber from operations is purchased by Tiley Industries who are focused on firewood but are looking to saw some of the higher quality residual wood into tile battens. Tiley also conduct the harvesting and haulage operations in the area.

A three year trial was commenced in early 2014 aiming to look of how some of the challenges associated with harvesting in the area are managed.

As part of the trial, the planning of harvesting operations at Mt Cole has considered a number of key factors, most importantly, ensuring successful regeneration of the forest after operations have been completed.

Mt Cole has a history of 'dieback' caused by the root rot fungus *Armillaria luteobubalina*. The key method of controlling this disease is to utilise seed tree or clearfell systems which minimises the number of living trees adjacent to dead stumps which are thought to be the main source of infection.

In addition, browsing is a significant issue which has led to fencing as standard practice around every coupe to keep out wallabies and deer which are largely responsible for the problem.

VicForests is planning to trial a selection coupe to look at whether this type of harvesting may assist in minimising the browsing problem and reduce the risk of regeneration failure, while also acknowledging the issues related to *Armillaria*.

Our Community Forestry team will be preparing a report on the operations at Mt Cole and if there are no significant barriers identified, plan to extend harvesting into the longer term.

Source: <https://www.vicforests.com.au/the-view-newsletter/the-view-december-2015>

³⁰ <https://www.vicforests.com.au/the-view-newsletter/the-view-december-2015>

Thank you to the Committee for consideration of my submission.

Further Reading

Tom Swann *On the make Gas and manufacturing in Australia* <https://australiainstitute.org.au/wp-content/uploads/2020/12/P938-On-the-make-gas-and-manufacturing-Web.pdf>

Scott Hamilton and Simon Holmes A Court <https://www.pv-magazine-australia.com/2021/07/07/australia-needs-a-green-hydrogen-target/>