Officials' Consultation Paper – Stakeholder feedback. Submission from Keith Burrows

I am a stakeholder in that I have 13 grandchildren who will be heavily, possibly disastrously, impacted by climate change if we keep doing things the way we are at present.

I argue that in fact no expenditure on incorporating hydrogen, or other supposedly renewable gases, into the current natural gas network is justifiable. In fact the only justifiable action, if we are to have any hope of a sustainable future (staying less than +1.5 to +2°C above past global temperatures) is to close down the household gas network as quickly as possible.

There is no reasonable scientific doubt that in order to hold global warming to safe levels we have to do everything humanly possible to cut greenhouse gas (GHG) emissions as fast as possible. The recent IPCC report is very clear on this and there are numerous papers in the scientific journals underlying this. See for example this recent article in [Nature, 05 April 2022](#): *IPCC's starkest message yet: extreme steps needed to avert climate disaster - Radical emissions cuts combined with some atmospheric carbon removal are the only hope to limit global warming to 1.5°C, scientists warn*, which summarises the scientific situation. It is not a matter of some gradual process of introducing slightly "cleaner" gases, it is a matter of eliminating the use of gas as fast as possible.

In fact, as we move toward zero emissions as quickly as possible it becomes quite clear that it is not only more effective in terms of cutting GHGs, it is also <u>cheaper</u> to move to a <u>fully electrical household energy supply</u>. There are several reasons for this.

1. Australia has plentiful supplies of renewable energy as both solar and wind energy. Indeed we have the best resources of renewable energy in the world - certainly on a population basis.

2. The cost of both solar and wind energy has plummeted over recent decades and is now by far the lowest cost primary energy source.

3. While "the sun doesn't always shine and the wind doesn't always blow", large scale energy storage by both batteries (short term) and pumped hydro energy storage (PHES) is perfectly feasible now. Furthermore, with an expanded and updated grid the need for storage is considerably reduced. The cost of batteries is continuing to fall and there are many possible sites for the well establised PHES technology. See, for example, [this article by Andrew Blakers](#) of ANU describing how feasible it is to create plenty of PHES in Australia in order to achieve 100% renewable energy.

4. While there is a case for the production of hydrogen from renewable electricity sources for use in industrial processes (iron and aluminium production for example), there is no feasible case for using this hydrogen in the domestic grid. There are two simple and clear reasons for this:
A) Converting electrical energy into chemical energy (as hydrogen) is at best 80% efficient. Furthermore, when burned in stoves or domestic heater, probably less than 60% of that chemical energy can be utilised.
B) Clearly, transmitting electrical energy is much simpler, cheaper and more efficient than building the new underground pipelines that would be needed to pipe hydrogen gas.

5. In terms of domestic energy use, electrical energy is now by far the most efficient and the cheapest form of energy to use. Induction cook tops and electrical heat pumps for both heating and hot water are much more energy efficient and far more climate friendly - once powered by renewable electricity.

6. Clearly there is a need to help householders to switch from gas to electric appliances, but because in the longer term their energy will cost them less it should be perfectly feasible to set up a government based loan system that would help them transition.

7. To sum up, if the energy industry is to invest large amounts of money in improving the efficiency and lowering greenhouse gas emissions of the power supply, that money should go to building wind and solar power plants and to modernising the electricity grid.

Keith Burrows. ███████████████████
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