

The Western Green Energy Hub



You may have seen the [ABC article](#) on the Western Green Energy Hub that quotes me on this project. Consideration of this proposal by the WA EPA and then the government will tell us a lot about the feasibility of green hydrogen projects in Australia. In any human endeavour at scale, including this one, there will always be adverse environmental, and often, social consequences. Greens MP Brad Petit is quoted in the article, saying:

"Let's get on and do renewable energy where it matters right now — connected to the West Australian grid, decarbonising the state rather than pretending that green hydrogen's going to solve all our problems,"

So, the first question is do we even need green hydrogen as a component of the energy transition? Well in fact, green hydrogen is going to be crucial in decarbonising the economic activities that can't easily be electrified with solar, wind and storage.

There are many industrial processes (which are responsible for nearly 40% of global emissions) which are difficult to decarbonise. Steel, cement, and chemicals are often cited as the most difficult. Using hydrogen as the heat source and the chemical reducing agent can eliminate CO₂ emissions in steel making. If that doesn't happen and we wish to continue making steel, then we move to the problematical alternative of continuing to use fossil fuel energy sources with carbon capture and storage.

It's not just energy production. Most organic chemicals derive from carbon-based inputs such as methanol; ethylene and their cousins. Nearly all chemical production of these (e.g. steam cracking) requires process heat temperatures of 1000°C. In the foreseeable future, only combustion can produce such heat. Presently, hydrogen is the only hope for replacing fossil fuels.

Most of the world's fertilisers are ammonia based and production currently uses natural gas as a fuel source to produce hydrogen as an input to the Haber-Bosch process which in turn produces ammonia. Green hydrogen is a direct substitute for the emissions-creating component of the process. Also, ammonia is also likely to be crucial in economically and safely transporting green hydrogen for other uses (and is part of the WGEH proposal).

While electrifying our light transport fleet is already underway, not much is yet happening with heavy-duty transportation sector applications (e.g. long-haul trucks, locomotives, ships) where electrical energy storage (i.e. batteries) is challenging. In contrast hydrogen offers long term storage with minimal losses.

It is important to understand that emissions must be dramatically reduced, ideally starting twenty five years ago, but otherwise now. We know that whatever technologies we will need to complement renewable electricity will take time to prove and then commercialise at the scale required to provide a meaningful contribution to the transition. If we dally in the development of green hydrogen without identified alternatives, we will fail to decarbonise in time to stabilise and then reduce the atmospheric CO2 concentration (which controls climate change – not annual emissions) this century. It is only projects of the scale of the Western Green Energy Hub that will deliver sufficient hydrogen to allow time for the technological changes in the industries that will use it to decarbonise. So, yes getting on with green hydrogen does matter right now.

Of course, that doesn't mean we should approve every project that comes along. Many won't proceed because we deem their environmental or social implications to be just unacceptable. Many will never stack up because of the massive financial risk to the investors. Remember it is not just the cost of these long term projects that is the problem. What will be the market price of this commodity in 10, 20 or 30 years? No one can currently confidently answer that question.

International observers might ask the question, if you can't develop a project in the Australian desert, where can you? However, those that have an appreciation of the extraordinary ecological value of this region, and the Mirning people who have thousands of years of intimate cultural connection to the land, will gladly explain it to them. So, how well are we prepared to answer the impossible question of whether the benefits outweigh the impacts, when both are uncertain? Not very well. Firstly, the job of the EPA is to conduct environmental impact assessments and provide strategic advice to the Minister for Environment. Sadly, it is not their role to weigh up the contribution of the project to combatting global climate change. As the government is very keen on the investment and economic elements of these projects, we know they will override environmental and cultural impacts if it suits, or back away if it looks like votes will be lost at whatever next election is looming. The Mirning now have the unenviable task of considering cost-benefit from their perspective. It's unlikely that everyone in the mob will be happy with their decision either way, if indeed they are able to make one.

So here we have the conundrum. We need green hydrogen projects to contribute to the energy transition, and have amongst the best natural resources in the world. We have also decimated biodiversity and ignored Aboriginal culture for 200+ years. However, the greatest threat to biodiversity and treasured landscapes is climate change. Can the independent assessment show that the environmental impacts arising from a footprint affecting 4.6% of the 2.3m ha of land (mostly wind turbines and solar panels and the cables between them) can be managed? Can the Mirning people live with the disruption? Can the investors make the project stack up? Personally I hope so.

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