

## **Exporting Australia's sunshine to the world, and transitioning our fossil fuel economy**

There is huge momentum around hydrogen right now.

As energy security concerns fire up, hydrogen offers a big opportunity to reduce our reliance on imported refined fuel, as well as the potential for a major new export market as economies like Japan, South Korea and Germany shift to hydrogen.

On decarbonisation, it has huge potential in sectors where it's previously been difficult to meaningfully reduce emissions – heavy industry (steel and alumina) and agriculture for example – and in sectors like transport with high fuel costs (long haul trucks, buses and heavy machinery on mining sites).

Alongside [federal efforts](#), the NSW Government's new [hydrogen strategy](#) aims to make the state a "hydrogen superpower." The opportunity here is to decarbonise tough corners of the economy, as well as future proofing jobs in the Hunter and Illawarra, with directly transferrable skills.

The NSW strategy provides up to up to \$3 billion in incentives and exemptions for 'green' hydrogen production, as well as a hydrogen refuelling station network to be rolled out across the state, on top of \$70 million already committed for hydrogen hubs.

The context here is that sooner or later Australia's thermal coal industry will disappear. Recent commentary from the Chair of the Energy Security Board, Kerry Schott, suggests this could be as soon as 2035. We shouldn't be naïve about how difficult this transition will be, but it also represents an enormous opportunity for Australia to create new jobs and new industries that will position us for the future.

To approach this confidently, we need proactive strategies to transition the economy and support coal-dependent communities as the world changes. This should be the great economic project of our generation, and one that takes advantage of our abundant renewable energy resources.

Alongside wind, hydro and solar energy generation, hydrogen is a key component of the future energy mix. In 2050, it's forecast to represent 13% of the world's energy demand and to reach USD\$4,000 billion in annual sales. What an economic opportunity.

Australia already has some of the infrastructure needed to enable this. However, almost all the hydrogen used today is 'grey' hydrogen – produced using energy from fossil fuels. 'Green' hydrogen is produced using renewable energy to power electrolysis that splits water molecules into their constituent elements: hydrogen and oxygen.

So, what do we need to enable a green hydrogen revolution?

- Abundant renewable energy to power the process of splitting hydrogen from water – NSW Renewable Energy Zones are accelerating this generation of solar and wind power above and beyond our domestic energy consumption needs
- Water, and preferably recycled water to minimise the use of drinking water – NSW already recycles wastewater and the this can be used in the hydrogen production process
- Export infrastructure to access the international demand from economies like Japan, South Korea and Germany that are rapidly transitioning to a hydrogen economy – Minister Kean called this “shipping our sunshine to the world”. The Ports of Newcastle and Kembla are well positioned to play this role, and attract skilled workers from fossil fuel sectors already based in those areas.

The NSW Government’s \$3 billion investment aims to give it an early mover advantage, potentially attracting up to \$80 billion in investment, to grow the hydrogen sector here in NSW, and give it a stake in efforts to bring the price of hydrogen down to a level that will make it competitive with other types of fuel.

With scale acknowledged as the biggest driver of cost reductions (90% of cost reduction for non-transport applications are from scaling up the supply chain), strategies such as the national hydrogen cluster network aim to drive a culture of collaboration within and across the 13 nationwide clusters to accelerate industry growth, create purchasing power, and drive a mindset of exporting IP and business models rather than “just exporting molecules.”

With WA and Queensland already investing in hydrogen, there is domestic competition to attract early investment and build scale. NSW is looking to incentivise its takeup with hydrogen hubs at major ports, a hydrogen refuelling network for heavy vehicles along major highways, as well as by creating a market-led framework to drive demand for green hydrogen, and waiving taxes and charges to dramatically reduce the cost of green hydrogen.

In addition to economic benefits, hydrogen has the highest energy per mass of any fuel, and ‘green’ hydrogen is both zero carbon in production, and zero emissions in combustion. This makes it a key element in decarbonising our economy – not just our cities – and getting to net zero emissions.

Hydrogen molecules can be stored for long periods, transported in compressed form, burned to produce high temperatures, and used in existing infrastructure and business models designed for fossil fuels. That means it offers a path to decarbonise a range of sectors – including long-haul transport, chemicals, and iron and steel – where it has proven difficult to meaningfully reduce emissions.

- Transport – hydrogen will compete with electric in the passenger vehicles and buses; however, for long haul and mining trucks, the storage capacity and ease of refuelling may mean hydrogen is a more effective solution, particularly as the price of hydrogen continues to fall.

- Buildings – hydrogen can be [blended into existing natural gas networks](#), with the highest potential in multi-family and commercial buildings, particularly in dense cities with high levels of reliance on natural gas.
- Power generation – hydrogen is one of the leading options for storing renewable energy, extending storage from hours to weeks, and hydrogen and ammonia can be used in gas turbines to increase power system flexibility
- Domestic fuel – green hydrogen can increase our domestic fuel production capacity, decreasing our reliance on international imports, and reducing exposure to international price fluctuations and supply constraints.

The future is not here yet, but this new strategy and investment from the NSW Government is accelerating the reality of a clean energy future. While production will likely start to reach a scale to make a serious dent in emissions beyond 2030, it puts NSW in a strong position to attract investment and set the ball rolling on a green economy that could ultimately dwarf coal and iron ore.