

2 April 2021

Submitted electronically to the Department of Industry, Science and Resources
at: [Future Fuels Strategy: Discussion Paper - Department of Industry - Citizen Space](#)

Re: Australian Hydrogen Council submission in response to the Future Fuels Strategy Discussion Paper

The Australian Hydrogen Council (AHC) welcomes the opportunity to provide a submission to the Australian Government's *Future Fuels Strategy: Discussion Paper*.

This is an important opportunity for policy makers to engage with the transport sector and those who rely upon it to develop a pathway towards a low emissions future. We believe that with appropriate support, hydrogen fuel cell electric vehicles (FCEVs) will play a part in this future.

We have attached our road transport policy positions in the attached document, which ask you to consider as part of our submission. We have chosen this approach so that we could provide context for our recommendations and also so that our priorities are clear.

Recognising the role for hydrogen relative to batteries

Overall, we support the approach outlined in the discussion paper, in particular the focus on commercial fleets. This is a sensible way to get efficiencies while the necessary infrastructure is still to be/being built.

However, we are concerned that the paper appears to consider FCEVs as playing second fiddle to BEVs. While we note that further consultation on FCEV recharging infrastructure under the Future Fuels Fund will occur in the second half of 2021, it is not clear to use how this will sit with the current discussion: the paper is asking questions *now* about needs in the hydrogen road transport space.

This would appear to be an important time for the Australian Government to define some priorities and to address the relative costs and benefits of different technology choices in decarbonising road transport. It is not all or nothing for BEVs and FCEVs; each has their place for different circumstances and hydrogen is sometimes not a choice but a necessity.

For example, FCEVs have benefits over BEVs in the commercial heavy transport sector. This is because they represent greater available payload (batteries in BEVs weigh more than the battery plus fuel cell in an FCEV), take less time to refuel than battery charging, and greater distances can be covered. In fact, hydrogen is likely to be a better replacement for current diesel use than batteries, for a range of applications.

Even where BEVs might appear to have a head start compared to FCEVs – such as the market for light passenger vehicles – this is not going to be the case for all consumers. We note, for example, that consumers without home access to charging infrastructure will not have the same ability to charge overnight as other consumers, and their ability or desire to wait for charging to occur at a charging station is not guaranteed.

What this means is that the Australian Government's support for FCEVs must go beyond the 'demonstration' level support proposed for refuelling infrastructure. Decarbonising Australia's road transport sector requires serious policy and funding commitment that must go beyond batteries and provide hydrogen refuelling at scale. This can start small, but it must be well targeted and capable of growing as the market develops.

The Future Fuels Fund and other sources of government co-investment are welcome contributions to closing the economic gap between existing fossil fuels-based transport technologies and those of the future. However, more is required at this foundational stage, at least in the form of prioritising funding attention to FCEVs and their supporting infrastructure.

Funding must be underpinned by appropriate policy to drive supply and demand. The attached sets out some recommendations on this, such as vehicle and fuel standards.

Multiple hydrogen applications are the key to scale for any one application

The development of FCEVs for road transport is not something that can be viewed in isolation; getting hydrogen to scale for any one use will require a range of offtake options to start with, and these are also opportunities for Australia to meet its decarbonisation goal. Hydrogen use in transport presents one such option, along with export, manufacturing and gas blending.

Importantly, we need to consider more than road transport – hydrogen shows particular value in train, marine and aviation applications. Ultimately the faster that these sources of demand are concurrently developed, the sooner the benefits can be enjoyed.

Applying the Future Fuels Fund

The AHC believes that within the FCEV element of the Future Fuels Fund there should be an initial focus on the development of a hydrogen refuelling network to service heavy vehicle transportation and to focus on commercial fleets located with, or close to, other hydrogen infrastructure.

Strong collaboration between infrastructure proponents and fleet customers is required to ensure that the technical specification of the infrastructure is closely matched to the customer's requirements. This to create efficiencies – we need infrastructure to service fleet needs with as little excess capacity or redundancy as possible, in order to minimise the losses associated under-utilised infrastructure.

It also means locating infrastructure where it can be expanded in size and capacity to match incremental increases in demand. The AHC considers that the hub and cluster projects in various locations around Australia will provide the best opportunity for the location for refuelling infrastructure.

Planning is vital

Finally, in addition to funding and policy settings, the Australian Government must provide clear planning and coordination for hydrogen supply and demand, including infrastructure needs. In fact this should perhaps come first, so there is better targeted funding and policy.

The creation of new low emissions industries in a transitioning economy requires leadership in the national interest. And this is all the more the case given the hydrogen sector also brings enormous economic benefits from export – a fact that is being increasingly recognised and acted on by countries with their own export aspirations. The window of opportunity for Australia to take the lead will close within the next few years and we need to act now to map the opportunity and coordinate action across the range of hydrogen applications.

As the global Hydrogen Council states:

... for low-cost clean hydrogen production, value chains for electrolysis and carbon management need to be scaled up. This will not happen on its own: a further step-up of public support is required to bridge the cost gap, develop low-cost renewable capacities and scale-up carbon transportation and storage sites.¹

Should you have any questions regarding this submission please contact me (t: 0413 266 081 or e: jkremzer@H2council.com.au).

Yours sincerely,



Joe Kremzer
General Manager, Policy
Australian Hydrogen Council

¹ Hydrogen Council, McKinsey & Company, *Hydrogen Insights Report 2021*, vi.



Position paper on the use of hydrogen in road transport

Australian Hydrogen Council

April 2021

Contents

About the Australian Hydrogen Council	3
The need to decarbonise transport	4
The current barriers to FCEVs	5
What needs to be done	5
1) Invest in flexible refuelling infrastructure for fleets	5
2) Value the multiple lives for FCEVs	6
3) Incentivise FCEV uptake through policy settings	7
4) Incentivise hydrogen and FCEV supply with funding and tax support for the hydrogen industry	8
5) Understand and meet consumer information needs	9
Conclusion	10

About the Australian Hydrogen Council

The Australian Hydrogen Council is the peak body for the hydrogen industry, with 69 members from across the hydrogen value chain.

Our members are at the forefront of Australia's hydrogen industry, developing the technology, skills and partnerships necessary to build Australia's hydrogen economy.



The need to decarbonise transport

Decarbonisation of Australia's transport sector is becoming increasingly urgent. Transport is Australia's second largest emitter, making up 19% of current greenhouse emissions.

Decarbonising transport will only occur with a mix of batteries and fuel cells.

While both batteries and fuel cells can be used for light vehicles, hydrogen has particular value in the heavy transport sector. As noted in the National Hydrogen Strategy, hydrogen fuel carries significantly more energy than the equivalent weight of batteries. This is particularly useful for buses, trucks and ships that carry heavy loads and can travel long distances or where battery weight compromises effective payload. It is also suitable for commercial use, where range anxiety and recharging/refuelling times affect the bottom line.

Transport applications also provide significant hydrogen offtake potential, which can help grow the hydrogen industry. This will in turn hasten the decarbonisation of other sectors of the economy. Transport uses are more piecemeal than other offtake solutions such as gas blending but have the advantage of having a public profile and can also replace diesel now.

Early wins

Analysis prepared by the Analysis Bureau of Infrastructure, Transport and Regional Economics for The National Hydrogen Strategy indicates that inter-city freight and intra-city heavy vehicles are likely to be two of the key areas for early focus for the development of hydrogen in transport.

Similarly, European research cooperative FCH-JU has released analysis showing that sales of fuel cell vehicles could comprise 17% of new sales in the European heavy trucking sector by 2030.¹

As Dr Alan Finkel notes in his recent Quarterly Essay, *Getting to Zero*:

In electric vehicles, there is a battle brewing between batteries and hydrogen, but it is split between light vehicles, in which arguably batteries have the upper hand, and long-distance, heavy-haul vehicles, such as cross-country freight trains and cargo ships, in which hydrogen will likely have the upper hand.²

Fuel cell vehicles also allow for greater productivity, as the time taken to refuel is broadly comparable with existing internal combustion engines. This is critical for vehicles which operate over multiple shifts where any increase in downtime can significantly alter return on investment.

Beyond hydrogen's applications for road transportation, AHC is aware of international developments to decarbonise the resources sector by employing FCEVs on mine sites, including what is believed to be the world's largest FCEV to come online in South Africa in 2021.

Developments of this nature will increase in importance if international plans to impose tariffs on carbon intensive imports, such as those announced by the Biden administration, come to fruition. The ability to decarbonise entire supply chains will play a significant role in shaping Australia's

¹ Ruf, Baum, Zorn, Menzel & Rehberger (2020) *Study Report; Fuel Cells Hydrogen Trucks; Heavy Duty's High Performance Green Solution*, prepared for The Fuel Cells and Hydrogen Joint Undertaking, Brussels, Belgium. See https://www.fch.europa.eu/sites/default/files/FCH%20Docs/201211%20FCH%20HDT%20-%20Study%20Summary_final_vs.pdf.

² Finkel, A. (2021) *Quarterly Essay: Getting to Zero*, Issue 81, Morry Schwartz: Carlton, p.86.

competitiveness in markets where carbon tariffs exist, and transport emissions will factor into this equation.

FCEVs: the consumer experience

Unlike battery electric vehicles (BEVs), a fuel cell electric vehicle (FCEV) can be filled from a relatively familiar looking bowser in just a few minutes. This will allow consumer road users to operate FCEVs in a similar manner to how they currently operate an internal combustion engine vehicle. This is of benefit to those who prefer the current mode of refuelling, including people without off-street parking that allows for overnight recharging.

Hydrogen compensates for its efficiency shortfall compared with batteries through other characteristics. Start with light vehicles. If you have a home with off-street parking, there is nothing more convenient than a battery electric vehicle. However, if you live in an older terrace house with no garage, or a modern apartment that did not come with a car parking spot, having to find a public charger and wait for your car to charge would be consistently inconvenient. In those circumstances, and recognising that prices are falling, a hydrogen electric vehicle is an attractive option.³

The current barriers to FCEVs

The rollout of FCEVs in Australia is not as advanced as that of BEVs.

There is currently little to no demand for FCEVs (and so few FCEVs available) and no infrastructure to support their use. Each of these factors is dependent on the other, creating a chicken and egg scenario. The demand for FCEVs will not grow until an adequate refuelling network exists, however investment in refuelling infrastructure is difficult to justify for the private sector in the absence of a significant vehicle fleet to use it.

Under such conditions, a market for FCEVs will not develop organically and government investment is required to drive the demand.

What needs to be done

1) Invest in flexible refuelling infrastructure for fleets

Commercial, and government fleets provide opportunities for FCEVs to establish a foothold. Many fleets operate on a 'back to base' basis and will require a single point refuelling station to be developed rather than rely on having access to refuelling infrastructure at several locations.

The purchasing power of fleet operators who buy multiple vehicles in a single transaction will help grow the penetration of FCEVs faster than individual purchasers.

³ Finkel, A. (2021) *Quarterly Essay: Getting to Zero*, Issue 81, Morry Schwartz: Carlton, p.86.

As noted in the Future Fuels Strategy Discussion Paper:

Bulk fleet purchasing could also drive vehicle makers to provide a wider range and more affordable new vehicle technology models to Australia.⁴

Governments are well placed to lead this growth in the early days of the Australian hydrogen industry as they can participate in pilots and trial programs without the primary focus on a financial return on investment, but instead with a greater eye to uncovering lessons to be shared with industry more broadly.

Funding and policy should initially focus on the development of a hydrogen refuelling network to service heavy vehicle transportation and to focus on commercial fleets located with, or close to, other hydrogen infrastructure. A more comprehensive refuelling network can develop on the back of lessons learned from these initial use cases.

Ideally, fleet refuelling infrastructure will need to be lean, to minimise the losses associated under-utilised infrastructure, but capable of growth to match increases in demand.

The current hub projects in various locations around Australia should provide a good opportunity for refuelling infrastructure.

2) Value the multiple lives for FCEVs

Heavy vehicles have long lifespans. Australia has one of the world's oldest trucking fleets, with an average life in excess of 14 years. Consequently, the adoption of new technology into the trucking fleet is relatively slow.

This issue is in part because of the lack of markets for second hand trucks. As the Trucking Industry Council of Australia has noted:

In Western Europe older trucks are sold into Eastern Europe and Africa. In the USA and Canada older trucks are sold into South America, and in Japan older trucks are sold into other less developed countries in the Asia Pacific region. Australia has no viable retirement plan (alternative second market) for older trucks.⁵

The trucking industry has grappled with this issue for some time, and until it is resolved it will act as a deterrent to FCEV introduction in this sector. The lack of a foreseeable secondary market for FCEVs at the end of their initial fleet lifecycle means that operators run the risk of being unable to recoup their initial investment when they dispose of the asset.

In fact, a number of AHC members have imported right hand drive FCEVs into Australia or are in position to immediately manufacture them to client specification if required. Potential operators have however expressed a reluctance to adopt FCEVs due to this potential stranded asset risk.

⁴ Australian Government Department of Industry, Science, Energy and Resources (2021) *Future Fuels Strategy: Discussion Paper*, p.4. See https://consult.industry.gov.au/climate-change/future-fuels-strategy/supporting_documents/Future%20Fuels%20Strategy%20Discussion%20Paper.pdf.

⁵ Trucking Industry Council of Australia (2019) *Modernising the Australian Truck Fleet, Budget Submission 2019/20*, p.9. See <https://treasury.gov.au/sites/default/files/2019-03/360985-Truck-Industry-Council.pdf>.

The more the market for new FCEVs is stimulated and the technology is proved to be viable, the greater the demand for second hand vehicles, especially as the cost of hydrogen and refuelling infrastructure comes down.

The AHC considers that direct funding must be deployed to assist fleet owners to invest in FCEVs. This will play a part in defraying the stranded asset risks currently faced by fleet owners.

And clearly the development of a secondary market for vehicles also requires FCEV refuelling infrastructure.

We suggest that fleet operators be incentivised to make their refuelling infrastructure available to secondary users of FCEVs (in a way which does not impede their commercial operations) as a means of ensuring that a market for old fleet stock can develop.

Geographic spread of FCEV use

AHC anticipates that FCEV penetration will take off within and surrounding hydrogen hubs, as the co-location of hydrogen offtakers in these areas may increase the commercial viability of refuelling infrastructure. These centres will also serve as testing grounds for associated services and infrastructure which is needed before FCEVs can expand their geographic footprint in a meaningful way.

Further, under Australian Consumer Law, vehicle manufacturers and dealers are obliged to provide appropriate service and support for any vehicles sold. When vehicles are rolled out within a confined location, the provision of these services is simplified. Manufacturers and dealers will need to plan and resource appropriately to support the uptake of vehicles outside localised areas and into the wider community.

3) Incentivise FCEV uptake through policy settings

Governments can provide the right signals by setting targets and reducing unnecessary barriers to uptake for vehicles. They can help create the demand that will draw through private investment in vehicles and infrastructure. This will give certainty to manufacturers and investors in the early stages.

Policy settings that will create demand for FCEVs will need to value the public benefit of clean hydrogen relative to incumbent fuels. This needs to be undertaken as part of a well-considered and articulated economy wide approach, as has been the case in nations where the transition away from internal combustion engine vehicles is more advanced.

These goals are mostly set out in official national policy documents, which describe transport—such as France and Norway—or climate goals and strategies—such as Denmark, Iceland, Ireland, the Netherlands, Scotland, Spain, and Sweden.⁶

This means setting:

- Light vehicle CO₂ emissions standard suitable for the Australian new vehicle market.

⁶ Wappelhorst, S. (2020) *Overview of Combustion Engine Car Phase-out Announcements Across Europe*, ICCT, p.7. See <https://theicct.org/sites/default/files/publications/Combustion-engine-phase-out-briefing-may11.2020.pdf>.

- CO2 emissions standard for new heavy vehicles (buses, trucks) to bring vehicles to Australia. For example, the EU target is for new heavy-duty vehicle CO2 emissions (average) to reduce by 15% in 2025 and by 30% in 2030, both relative to a 2019 baseline.
- Euro 6 noxious emissions standards for light and heavy vehicles.

We also urge governments to set a 50% zero emissions vehicle target for fleets of cars, buses and ancillary vehicles for 2030. This would include privately operated public transport fleets and government owned logistics providers.

4) Incentivise hydrogen and FCEV supply with funding and tax support for the hydrogen industry

A range of offtake options is necessary to create the hydrogen industry.

Use in transport applications presents one such use case, along with export, manufacturing and gas blending. Ultimately the faster that these sources of demand are concurrently developed, the sooner the benefits can be enjoyed. The necessary markets will not grow organically where it is not yet economic for them to do so and until the hydrogen industry has reached commercial scale, grant funding is essential.

We welcome the recent announcement that ARENA would receive guaranteed baseline funding of \$1.43 billion over 10 years, and we observe that hydrogen remains a clear ARENA priority. However, we note that hydrogen still competes with subsidised fossil fuels, and that hydrogen commitments from other governments have been particularly strong.

In addition to directly providing funds to stimulate the growth of an Australian hydrogen industry, the AHC proposes a range of measures which can be used to incentivise investment in hydrogen technology. These include:

- Treating any grant funding from ARENA as assessable over the life of the project rather than in the year the grant funding is received.
- Reducing tax write-off periods for hydrogen infrastructure (perhaps 1-3 years).
- Increasing the effective rate of tax offsets (from the current rate of 8.5% to 20%) and expenditure thresholds (beyond the A\$100 million cap to A\$500 million).
- Legislating for the immediate tax deductibility for all salary and wage costs for the construction of hydrogen production and distribution projects. These are a significant expense and requiring them to be capitalised for tax purposes acts as a disincentive to employment and infrastructure development.
- Treating front-end engineering design costs for hydrogen projects as immediately deductible under Division 40-730 of the Income Tax Assessment Act, 1997, rather than being capitalised.
- Adapting the excise regime over time to apply a levy to fuel consumed in Australia based on its carbon content. Initially (say over a 5-year period), credits for businesses could be phased out to allow for a transition to new energy technologies.

While a number of these positions would incentivise investment in hydrogen technology more broadly than in relation to vehicle purchase and refuelling, we consider them to be applicable in this scenario.

Further, while changing tax laws cannot close the hydrogen investment gap, the tax system can play a role. The existing tax laws are largely in place and could be tailored relatively easily to capture hydrogen projects of national significance.

The case for a new approach to revenues

Governments have traditionally derived revenue from road users through fuel excises and GST. As BEV and FCEV users will avoid fuel excise and incur less GST on a per kilometre basis, a new approach to ensuring that all road users pay an equitable share is being considered.

The AHC is supportive of measures to promote fairness and equity among road users in terms of their contribution to road upkeep and maintenance. We are not supportive of road user charges which act as a disincentive (or perceived disincentive) to BEV or FCEV ownership. We believe that the current transition from fossil fuels to low emissions technology presents an opportunity to reform taxes and excises associated with road use to better reflect future societal needs.

5) Understand and meet consumer information needs

Commercial and private users will rely on relevant and accurate information to assist with the purchasing decisions.

AHC considers three key information gaps need to be addressed in order to facilitate the penetration of FCEVs into Australia's vehicle fleet. These information gaps relate to the following:

- **General hydrogen information**

Some Australians are extremely engaged with the role of new technology in decarbonising the transport sector. Most others, however, would have only limited familiarity with fuel cell technology, and with hydrogen more generally.

The AHC shares the view of many stakeholders that the hydrogen industry in Australia cannot flourish without appropriate community engagement. The AHC is working with stakeholders across state governments and industry to improve the information available to consumers. This information relates particularly to hydrogen's role in decarbonising Australia and of course allaying safety concerns.

If Australia is supporting the development of this industry, an important component will be to ensure that all Australians are brought along the journey, so they gain and maintain confidence in what is happening. Ensuring Australians have access to information about hydrogen and the emergent industry is also important for raising awareness about the potential industry and benefits it may bring.⁷

⁷Ashworth, P., Witt, K., Ferguson, M., & S. Sehic (2019) *Developing Community Trust in Hydrogen*, University of Queensland: Brisbane, p. 8. See https://energyministers.gov.au/sites/prod.energycouncil/files/publications/documents/nhs-developing-community-trust-in-hydrogen-report-2019_0.pdf.

While this approach pertains to all potential applications of hydrogen, interactions with FCEVs may be the closest that many Australians get to hydrogen infrastructure, and as such it is crucial to engage with motorists to drive acceptance of FCEVs as a zero emissions road transport option.

- **Vehicle information**

Potential purchasers are likely to be at least a little familiar with the terminology relating to internal combustion engine vehicles. However, they will need support – at least initially – to make appropriate choices relating to FCEVs. The ability to access accurate information about electric vehicles in a manner which is easy to understand (and compare) will play a large part in aiding the uptake of FCEVs.

We note that Government plans to redevelop the Green Vehicle Guide to include information on FCEVs when these become available for private purchase. We support this step but consider that this approach will be most cost effective if the Green Vehicle Guide is developed with an eye to addressing the information gaps which are not already being addressed through other mechanisms including vehicle manufacturers and dealers.

With a number of vehicle manufacturers announcing plans to cease production of internal combustion engine vehicles within a relatively short time frame, these manufacturers are incentivised to engage with consumers in a manner which addresses their information needs.

The AHC considers that the industry (along with associated sectors including motoring media) is well placed to ensure that consumers understand how BEVs and FCEVs compare with each other and with their internal combustion engine counterparts.

- **Refuelling network information**

In order to drive the market for FCEVs for private use (as opposed to fleet operations with access to dedicated refuelling infrastructure) AHC considers that information detailing to the location of publicly accessible refuelling infrastructure is necessary.

We note that online maps of BEV charging stations have been developed by EV enthusiasts, motoring organisations, industry associations and state governments and anticipate that the need is likely to be filled by these same groups with regard to FCEVs.

Conclusion

Australia has the opportunity to become a world leader in hydrogen production and export. Whether or not we realise this opportunity, there is a need to plan for a hydrogen future. Vehicle manufacturers across the globe have signalled their intent to cease, or at the very least reduce, production of internal combustion engine vehicles.

Australia can lead the transition to zero emissions transport through planning to deliver policy and infrastructure to support FCEVs and BEVs. Alternatively, we can play catchup as the rest of the world makes the transition without us.

In either case, FCEV refuelling infrastructure will be required to support the Australian economy and way of life. It is best to start planning now to ensure that we have a vehicle fleet to meet our future needs.