MANUFACTURINGAUSTRALIA

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Thursday 3rd August 2023
Hydrogen Headstart Taskforce
Australian Renewable Energy Agency
Department of Climate Change, Energy, the Environment and Water
hydrogenheadstart@dcceew.gov.au

Hydrogen Headstart Program Consulation Paper

Thank-you for the opportunity to comment on the Hydrogen Headstart Consultation Paper.

Manufacturing Australia (MA) is led by the CEOs of some of Australia's largest manufacturing companies: Alumina, BlueScope, Brickworks, Capral, Cement Australia, CSR, DuluxGroup, Incitec Pivot, Orora, Rheem, Sims and Tomago Aluminium. These companies are key to Australia's sovereign manufacturing capabilities.

MA's member companies provide direct and indirect employment to more than 100,000 Australians, operate more than 500 manufacturing plants or smaller facilities around Australia and support more than 25,000 downstream suppliers.

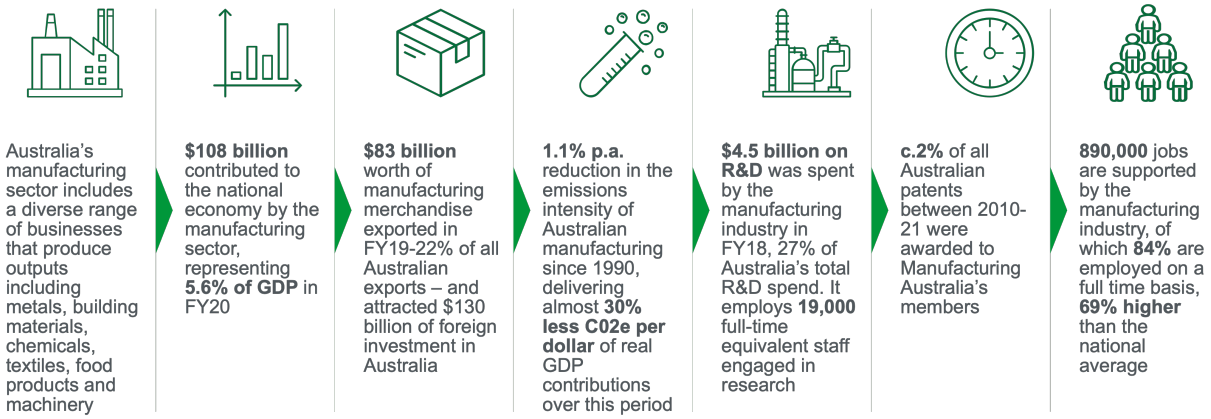
In addition, these companies have direct operations in more than 30 countries globally, and export to more than 50. They are amongst Australia's most innovation-intensive businesses, having spent more than $2bn on R&D over the past decade, and with more than 50 research partnerships in place with Australian universities and the CSIRO. The exhibit below summarises the broad benefits afforded to the Australian economy from domestic manufacturing capabilities.

Australia has a significant opportunity to create and retain high-quality jobs, grow its manufacturing sector and "re-shore" capabilities lost to imports, through a carefully managed transition to low emissions manufacturing. A successful transition that delivers globally competitive Australian energy inputs not only secures today's c.1.3 million direct and indirect manufacturing jobs but could also create c.100,000 new, high-quality manufacturing jobs.

Developing a globally competitive hydrogen industry is an important part of that transition. MA research undertaken in 2022 identified green hydrogen for use as a process feedstock and green hydrogen for use in process heating as two of the most important long term emissions reduction pathways for Australian manufacturing industries (the other two being direct electrification using clean energy and carbon capture, usage and storage.)

Consequently, potential hydrogen applications are the subject of considerable R&D investment by MA member companies, making the Hydrogen Headstart an important and relevant initiative, which is welcomed by MA.

Some MA members are providing separate submissions in response to the proposed design, either in their own right or via industry-specific associations. Some of these submissions may include commentary on specific projects. This MA submission does not seek to replicate those project or application-specific comments. Rather, it reinforces key principles relevant across the MA membership, for consideration in designing the Hydrogen Headstart Program.



Source: *Low Emissions Manufacturing: Australia's Opportunities.* Manufacturing Australia/L.E.K Consulting. March 2022.
https://www.lek.com/insights/sr/low-emissions-manufacturing-australias-opportunities

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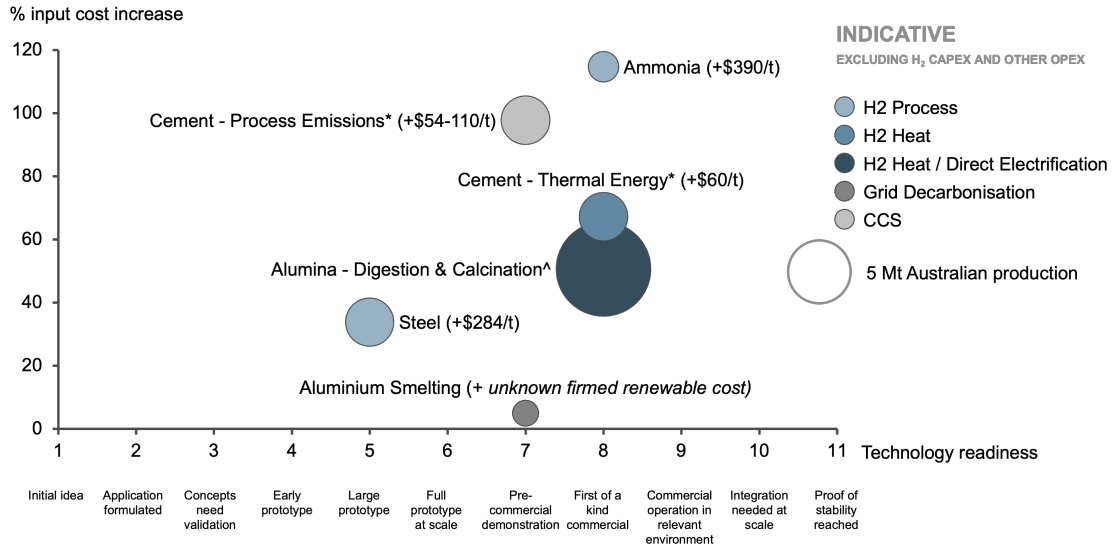
Hydrogen Headstart Program: Manufacturing Australia Comments

Manufacturing Australia (MA) welcomes the Hydrogen Headstart as an important mechanism to incentivise investments in hydrogen production in Australia.

The below exhibits demonstrate the importance of H2 for processing and H2 for heat as decarbonisation pathways for Australian manufacturing. They also, however, demonstrate that these applications remain in relative infancy, with substantial barriers to overcome, both in terms of technology readiness and cost competitiveness, before they can be implemented at commercial scale.

Vertical	Short term pathway (examples)	Long term pathway	Pathway family
Ammonia	Partial substitution of green hydrogen Incremental energy / resource efficiency improvements	Hydrogen produced through electrolysis using renewable energy (Green Hydrogen) as input for ammonia synthesis	H_2 for process
Steel	Electricity from excess byproduct fuels	Hydrogen-based Direct Reduced Iron (H_2-DRI) combined with electric arc furnace (EAF), where hydrogen is produced through electrolysis using renewable energy (Green Hydrogen)	
Cement	Increased use of SCMs Increased use of alternative fuels (e.g. wood wastes)	Hydrogen as a fuel, produced through electrolysis using renewable energy (Green Hydrogen) Carbon Capture & Use / Storage (CCUS) for process emissions (Note: Multiple solutions required)	H_2 for heat
Alumina & Aluminium	Calcination: Fuel substitution and incremental energy / resource efficiency improvements	Hydrogen as a fuel, produced through electrolysis using renewable energy (Green Hydrogen)	
	Digestion: Mechanical vapour recompression	Direct electrification of digestion for low temperature process heat	Direct electrification
	Smelting: Inert anodes	Firm renewable electricity from the grid	

Key emission reduction pathways - cost impact and technology readiness ($70/MWh delivered electricity)



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MA makes the following comments for consideration in implementing the hydrogen headstart program.

1. **Prioritise domestic use and value add:**
   In considering projects' eligibility for support, priority should be given to those projects that will lead to domestic use and value-adding to hydrogen. This could be achieved by a requirement that some hydrogen production is reserved solely for domestic consumption, or via the application of merit criteria that offers greater weighting to those projects that are intended to service domestic downstream industries. Export focused projects that primarily benefit international customers should be incentivised predominantly through international funding via export customers or incentives.

2. **Consideration of value and suitability of export fuels:**
   Some consideration and weighting should be afforded to alternative, value added, export fuels derived from Hydrogen, such as ammonia or ethanol. This consideration should include some of the technical challenges in the safe and cost effective export of hydrogen, as well as some comparison between the total value added to the Australian economy from exporting hydrogen vs exporting alternative, higher value added fuels and products.

3. **Minimum project size:**
   The proposed minimum project size of 50Mw will bring significant large project risk and complexity and is a substantial uplift on current projects, none of which are >10MW. MA contends that smaller projects with domestic higher value add should also attract support under the Hydrogen Headstart, especially those that would likely drive greater local uptake and price discovery in the domestic market.

4. **Funding model:**
   The proposed ten-year production credit is welcome, but may not be sufficient to incentivise relevant projects, given the capital intensity of targeted projects. Upfront capital expenditure incentives should also be considered.

   Funding should also seek to stimulate lowest cost of delivered hydrogen on both sides of market (supply and demand). The preference for very large projects requires matching of large projects with large demand sources. Consequently, some smaller demand opportunities may be missed, despite the importance of smaller demand opportunities both to stimulate market growth and uptake and to maximise domestic value add. One possible option would be for governments to play a role in aggregating or "book building" demand for smaller players.

5. **Use of existing renewable energy:**
   The proposed design permits use of existing electricity generation, without the need for corresponding investment in new renewable energy to power electrolysers. This will likely have a parasitic effect on existing electricity loads and limit other opportunities for cost-effective direct electrification of industrial processes. While acknowledging that there is an inherent trade-off in this regard, MA contends that new hydrogen projects should be required to be supported by new power generation.

6. **Industrial Hubs/precincts:**
   MA supports and sees considerable merit in establishing H2 Hubs in the vicinity of future hydrogen production projects. There is a practical and appropriate role for governments in seeking to coordinate the interest of domestic offtakers, developing expansion pathways over time and driving synergy in terms of power generation, transmission build out, hydrogen production, downstream fuel and manufacturing value adding.

7. **EOI Timeframe:**
   Finally, an eight week EOI timeframe is very short for the level of project, supplier and customer information required. MA recommends this be extended in consultation with participants on both sides of the market based on a more realistic estimate of EOI timeframes.

Thank-you for the opportunity to comment on the proposed design of the Hydrogen Headstart program.

Yours Faithfully,
Ben Eade
Chief Executive Officer
Manufacturing Australia