17 July 2024

HFA Submission for the Hydrogen Production Tax Incentive

The Hydrogen Flight Alliance (HFA) welcomes the opportunity to provide a submission for the Hydrogen Production Tax Incentive Consultation Paper. The HFA was officially launched in June 2023 with the attendance of the Hon Mick de Brenni MP, Queensland Minister for Energy, Renewables and Hydrogen, and is working collectively to create a collaborative environment to advance hydrogen electric flight in Australia, using green liquid hydrogen. Our members include:

1. Stralis Aircraft
2. Skytrans Airlines
3. Brisbane Airport
4. Gladstone Airport
5. Aviation Australia
6. AMSL Aero
7. Royal Flying Doctors Service QLD
8. Toowoomba Wellcamp Airport
9. BOC, a Linde Company
10. H2 Energy Company (h2ec)
11. Griffith University
12. Central Queensland University
13. Queensland University of Technology
14. Hypersonix
15. FABRUM Liquid Hydrogen Solutions

The focus of the HFA is to enable emission free hydrogen powered propulsion and flight in Australia, working toward commercial flights from 2026. Green liquid hydrogen, produced locally from renewable energy sources in Australia, will be used as fuel, which is converted to electrical power using a hydrogen fuel cell.

Green liquid hydrogen will play a crucial role in aerospace decarbonisation and can be used for direct combustion or with fuel cells to power aircraft. This includes efforts by global leaders such as Airbus. The IATA Aircraft Technology Net Zero Roadmap clearly identifies liquid hydrogen as a key energy solution, with advanced fuel cell flight tests with liquid hydrogen commencing from 2023.

Closer to home, HFA members Stralis Aircraft, AMSL Aero and Hypersonix are all designing, developing, and testing new aerospace technology and powertrain systems that will use liquid hydrogen as fuel. These are all being developed in Australia with a global customer base.

The HFA have provided feedback on the most relevant sections of the Hydrogen Production Tax Incentive Consultation Paper based on our work to date and priority action areas. If you have any queries or would like to follow up, please get in touch.

Best regards,

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1. **Please provide any feedback on the impact this incentive may have on your community, facility or industry.**

   The HFA believes the impact of the incentive plan will be positive and will directly support the commencement of new green hydrogen projects, and the HFA is particularly interested in green liquid hydrogen. It will enable the establishment of green hydrogen use cases from mobility to large scale ammonia and other derivative production. Domestic production will support the aviation and transport sectors to transition away from fossil fuels and this incentive will allow for domestic uses cases to be implemented quicker which build the range of skills required. While this incentive is not on a par with the detail and impact of the US IR Tax credit, its simplicity is to be celebrated.

   Any incentive must be sensitive to a range of environmental and social licence issues which could impact communities, for example water consumption and local housing needs.

2. **Please provide any feedback on the proposed eligibility criteria.**

   The announcement and funding of the Hydrogen Production Tax Incentive (HPTI) signals the confidence of the Australian Government in the hydrogen and derivatives industries and provides a recognition that clean molecules and fuels will be needed if Australia is to achieve whole-of-economy decarbonisation.

   - The 10MW and above eligibility criteria is likely to limit the ability for smaller and more remote community projects which the HFA believe should also benefit from this scheme. This would limit the development of regional mobility and remote power generation applications. On that basis the HFA suggests 1MW and above would be appropriate to ensure additional projects can progress.
   - The boundary limits set, for the 0.6kg of CO_2 per kg of hydrogen, must be able to be validated as part of the GO scheme. This number is low when compared to international schemes and may limit the ability of projects to become eligible for non-electrolysis production technologies that are also low carbon intensity. These include waste to hydrogen as an example. A value around 1.5kg of CO_2 per kg of hydrogen may be more appropriate.
   - Projects involving hydrogen project of the sizes being considered are typically run over approximately 15 years. On this basis we propose the tax credit be available for up to 15 years for an eligible project according to application of the current definition up to 2040.

3. **What key factors would need to be accounted for in a definition of an eligible facility for the purposes of the HPTI?**

   Simple but transparent criteria will be a key factor in supporting future projects to reach a Final Investment Decision (FID).

   We believe the tax credit should also be indexed to inflation. This would ensure that any benefit from the tax credit does not reduce over time which will dilute a business case.

The key factors which should be included in the definition of an eligible facility need to be minimum capacity, emissions intensity (carbon dioxide per hydrogen produced) including GO Certification Boundary Limits and community benefit criteria. Any other criteria to be included must be clear and not complicated to support successful implementation of the HPTI within industry.

4. What key factors would need to be accounted for in a definition of Final Investment Decision (FID) for the purposes of the HPTI?

It will be challenging to come to an objective definition of FID that will be of value to the HPTI process. It may be possible to agree upon a checklist of minimum requirements aligned with the requirements by bodies such as ARENA via the Hydrogen Headstart criteria for final investment, the CEFC, NAIF, or EFA. However, the execution or implementation of processes associated with FID vary across companies, boards and investors. We recommend that whatever is chosen should be tested and agreed with public and private lenders as being a sensible minimum standard.

Alignment with the ARENA and or Hydrogen Headstart programs processes should be easily supported by the HPTI.

5. How long do you expect it will take for projects to reach first production following FID?

The time frames on which projects reach first production after FID are dependent on the project size or maximum capacity. Changes in legislation or regulations could impact the correlation between start of FID and first production.

From a HFA member we understand larger projects, in the realm of 200MW+, could take up to 3 years to reach first production. The complexities of offtake arrangements may further delay some projects.

6. Please provide any feedback on the proposed emissions intensity threshold of 0.6kg of carbon dioxide equivalent up to the production gate.

It would be useful for the proposed emissions intensity threshold to include worked examples of how this could be applied which might show system boundaries and proposed inclusions/exclusions (for example scope 3 emissions related to purchased water used within the electrolysis process). It should be made very clear to proponents what methodology will be used to calculate the emissions intensity (i.e. a standardised/recognised approach) as this is an established criteria for eligibility.

The final boundary limits of the GO scheme need to be defined before this emissions intensity threshold is legislated as it may be too low and unintentionally rule out other non-electrolysis hydrogen production processes.

This proposed threshold of 0.6 kg of carbon dioxide equivalent is low when compared to international schemes and may limit the ability of projects to become eligible for non-electrolysis production technologies that are also low carbon intensity such as waste to

hydrogen as an example. A value around 1.5kg of CO2 per kg of hydrogen may be more appropriate.

7. Other than electrolysis, what production processes would meet this emissions intensity threshold now or before 2030?

There are several emerging technologies that should be included for consideration in the program including waste to hydrogen, biogenic hydrogen from biomethane and gasification technologies. The HFA believes these alternate production processes should be assessed against the emission intensity threshold criteria and a hydrogen volume produced criteria (against the electrolysis production equivalent).

As a principle, the projects that comply with the GO scheme and meet the intensity threshold should also be eligible for the HPTI. If there is any internal inconsistency between the two schemes (for example, to prohibit certain methods of production) they should be resolved and clearly stated in the legislation.

8. Please provide feedback on the proposed minimum capacity requirement (equivalent to 10 MW electrolyser)?

It is important when considering proposed minimum capacity requirements, the context that the industry in Australia is still in its infancy. Given this, we support minimum capacity requirements for projects which are 1MW and above as they will best support pilots and deployments that may otherwise be delayed by insufficient customer offtake required for larger scale plants in the short term.

The HFA suggests a minimum of 1MW as being the most appropriate to help ensure regional and remote power generation projects are not disadvantaged. In other cases, smaller projects can support key mid-sized industries, such as remote airports and airlines, farm operations and food processing to decarbonise.

Another important factor to consider is that 1MW projects are of key importance for electrolyser manufacturers in Australia. This will allow local manufacturers to invest and develop capability at a manageable level before scaling up to help meet future requirements.

Small, distributed production of hydrogen for local or single facility use (including for heavy vehicle and aircraft refuelling) is a model of development that the industry has been trying to get off the ground for several years, largely in the absence of any demand stimulus measures or tax incentives. The eligibility criteria for the HPTI largely locks these smaller (less than 10MW) projects out, even though they reflect important decarbonisation opportunities. It is important too that the demand for remote power in indigenous and rural communities, agriculture, or remote mobility and service needs including hydrogen-electric aviation, are all considered and prioritised in a distributed model of production which is most likely to succeed in regional areas.

Consideration could also be given to expanding the eligibility criteria that requires eligible facilities to be on a single site, for example if several refuelling stations were part of one consortium delivering projects across multiple sites, this would enable a broader range of projects and users to build scale and demand for hydrogen and derivatives.

9. **For renewable production processes other than electrolysis, is using the minimum capacity requirement of "equivalent to a 10MW electrolyser" appropriate? Is another definition of capacity required to deal with other production pathways?**

   There is potential for some ambiguity here when weighing up the appropriateness, as different electrolysers have different power efficiencies. This means that not all 10MW electrolysers will produce the same set amount of hydrogen.

   The HFA proposes that the minimum capacity requirement should reference a minimum volume threshold regardless of the production process being considered. An example of this is if the minimum capacity requirement is 1MW electrolyser or equivalent nameplate of 400kg of hydrogen per day. This would, we believe be a more well-defined approach.

10. **Should grid connected electrolyser projects be required to match their hydrogen production with electricity generated by the same electricity grid? Please provide feedback on this proposal.**

    Yes, grid connected electrolyser projects should be required to match their hydrogen production with renewable electricity generated by the same electricity grid.

11. **Please provide feedback on the proposal to not include additional requirements on renewable energy generation for access to the incentive, such as additionality and hourly time-matching with hydrogen production.**

    We are supportive of the proposal to not include additional requirements on renewable energy generation for access to the incentive, but the production of hydrogen and subsequent liquefaction should be powered by renewable energy to ensure it is 'green'.

12. **The proposed GO scheme will be used to support the registration and verification of hydrogen production. Are there any additional factors that would need to be accounted for in the proposed design of that scheme?**

    This is a sensible approach as the GO scheme also offers end users confidence in CO2 emissions. This confirmation is key for a potential green premium to develop over time. This should also apply to hydrogen liquefaction.

13. **The Government may legislate the administrative arrangements in subordinate legislation. Please provide any feedback on this proposed approach.**

    We support this sensible approach.

14. **What obligations should be imposed on potential recipients of the HPTI to ensure the community benefit principles are met?**

Community benefits from employment, training, environmental and air quality should be considered in all projects. This could include targets around local employment. Local content is a current challenge given the majority of hydrogen ready equipment is produced in the US, EU and Southeast Asia. This could be reviewed in 5 years as Australian manufacturers develop offerings in this space under the wider *Future Made in Australia Act* but would be a challenge for projects in the next 5 years at least.

15. What obligations are potential recipients of the HPTI currently subject to that might support the community benefit objectives (noting these will be finalised under the *Future Made in Australia Act*)?

The HFA is supportive of the *Future Made in Australia Act's* focus on economic and jobs growth in emerging sectors within Australia. Government contributions to skills development should be continued.

16. Are there any additional objectives that you consider important? What obligations might support these?

Nothing to add.

17. Recipients of the HPTI may be subject to additional transparency and disclosure requirements in order to be eligible. What kind of requirements are appropriate? What are the key practical considerations to take into account when setting the requirements?

ARENA project processes to ensure transparency worked well and this could be replicated for the hydrogen production tax credits. Requirements which are set should not be onerous.

18. What information do you consider important for the community that should be reported publicly on the recipients of the HPTI such as the amount of credit received?

The HFA supports the publication of hydrogen produced by each recipient to provide transparency to the community and sharing evidence of where the hydrogen produced is used (including domestic and export breakdown) and would allow the mapping of key applications and identify areas for future investments. Examples of applications could include mobility including aviation, agriculture, chemicals, industrial heat and export.

Projects should support the development of future projects. This could be achieved through participation in "lessons from learnings" session which is currently a part of receiving ARENA funding.

19. Who should the reporting requirement be imposed on? For example, on the recipient entity, or central reporting through a regulator?

The regulator should produce basic reporting for those accessing the tax production credits. This creates transparency across the sector.

20. **Please provide feedback on the proposed treatment of the interactions between the HPTI and other forms of Commonwealth, State or foreign government support.**

    Currently, most hydrogen projects need to combine different funding sources to be commercially viable. Hence, the ability to 'stack' these incentives is an excellent approach. This ability to stack funding schemes is seen in the US and EU and enables projects to achieve FID more quickly which is key to meeting Australia's climate change targets.

21. **How can the HPTI best leverage other types of support? Please provide examples relevant to your project if possible.**

    HPTI effectively reduces the net variable cost of hydrogen production. Some other supports available in Australia come in the form of grants for capital. Both have their place, and both incentivise the industry in different ways. HPTI will encourage recipients to produce higher volumes of hydrogen for use and into the market. In comparison grants for capital support targeted investment in infrastructure and production capability. HPTI forms a part of the funding solution and it is critical it can be "stacked" with other funding options to support more hydrogen projects to achieve FID. There can be challenges with the high cost of hydrogen production to secure offtake commitments from end users, including the mobility sector. The HPTI will assist in addressing this issue.

22. **What are the key practical considerations with receiving support through the HPTI and the Hydrogen Headstart program simultaneously?**

    Ensuring similar methodology or approach to reporting obligations will reduce rework if receiving support from HPTI and Hydrogen Headstart simultaneously.

23. **Are there specific interactions with other support programs that should be considered?**

    Some of the support programs which should be considered are the NSW Renewable Fuels scheme, ARENA capital grants and the ACCU scheme. All programs should be allowed to be combined to ensure projects meet FID and enable the start of the hydrogen market in Australia.

Supporting Documentation on Emissions internationally

Please find below some alternative CO2 emissions values used by Governments internationally.

Lifecycle GHG emissions rate per kg of produced hydrogen	Tax credit amount	Full credit amount (assuming labor requirements are met)
2.5 - 4kg of CO2e	$0.12	$0.60
1.5 - 2.5 kg of CO2e	$0.15	$0.75
0.45 - 1.5kg of CO2e	$0.20	$1.00
0 - 0.45kg of CO2e	$0.60	$3.00

Table 1: US IRA carbon emissions maxima

International Comparisons

[Comparison of the emissions intensity of different hydrogen production routes, 2021 – Charts – Data & Statistics - IEA]