SUNSHINE HYDRO
keeping the lights on®

12 July 2024

Director
Production Tax Incentives Unit
Corporate and International Tax Division
Treasury

We welcome the opportunity to provide feedback about the proposed Hydrogen Production Tax Incentive (HPTI).

Sunshine Hydro is a company that designs and develops clean energy projects that are called Superhybrid™. Superhybrid is an ecosystem of assets that generate 24/7 carbon-free electricity and green fuels.

Superhybrid™ consists of long-duration electricity storage and production facilities for hydrogen. Hydrogen is further converted to green fuels that have a clearer path to market, such as e-biomethanol or sustainable aviation fuel (SAF) by adding a renewable carbon source, e.g. biomass.

Hydrogen and green fuel production provides a flexible load that can be ramped up and down to support the contracted delivery of the 24/7 electricity and green fuels. The asset ecosystem also trades on the electricity and frequency markets and provides grid support services.

We sincerely welcome the Federal Government announcement of the HPTI and believe that it is the right type of support that the Australian industry needs to become a globally competitive 'renewable energy superpower'. However, as we will explain in this submission, the devil is in the detail and the careful planning of this subsidy is paramount to avoid unintended adverse consequences to the Australian energy transition and leakage of subsidies outside of Australian borders.

We are happy to provide further information and welcome a discussion on the topics related to our submission or other questions you may have for us.

Sincerely,

Michael Myer
Chairman

We find that providing subsidies in the form of a production tax credit is the most effective way to support a new industry to grow. We are pleased that HPTI is a reliable subsidy that businesses can plan on and that it provides a level playing field for competing projects and companies. The basic design of the incentive also creates the urgency that is required from the energy transition as a response to climate change.

The most important problem of the high-level design presented in the consultation paper is the lack of requiring hourly time-matching, additionality and locational matching. We acknowledge that these requirements are challenging to overcome and some may view them as barriers, however they are not prohibitive, bring a variety of benefits, and they are used in other countries for a very good reason.

When the US joined the EU with almost identical requirements for green hydrogen (with only minor discrepancies on the timelines), the international standard was clearly set. Ignoring these requirements will risk resulting in a number of adverse outcomes for the Australian context, which we will detail below.

We also wish to make the case for alternative hydrogen carriers and production methods, and challenge the eligibility criteria proposed for a minimum project.

Importance of hourly and locational matching and additionality

Questions 11, 12

The EU and the US have designed their hydrogen schemes based on these basic requirements to avoid the adverse impacts to the electricity market from the introduction of large-scale hydrogen production. If the renewable energy is cherry-picked from the existing electricity grid for creating “green” hydrogen while the emission intensity of the remainder of the grid electricity increases as a result, the overall decarbonisation of the energy sector is not progressed at all.

It is imperative that a new demand of such scale comes with additional renewable generation and that this generation can physically be transmitted to the location of the consumption - otherwise the new demand exacerbates the transitional challenges the electricity market is already grappling to manage.

International competitiveness of the Australian industry and products

If the Australian green hydrogen does not match the international standards, it means that the products, like green metals produced using that hydrogen, will not be recognised as ‘green’ outside of Australia. This creates an additional barrier for export as international buyers will know that a typical Australian producer will not comply with the standard and they look elsewhere.

Risk of leaking the subsidy abroad

There is a risk that Australian companies exporting 'green' hydrogen that does not meet the international standards, must pay border carbon tax or similar penalties at the border through mechanisms like Carbon Border Adjustment Mechanism (CBAM) in EU or UK for example.

Essentially this means that the economic benefit provided by HPTI may make the Australian green products competitive enough to win the deal, only to transfer the subsidy at the border to the importing countries.

Encouraging generation at the wrong time

The challenge of having vast amounts of solar generation in a grid is well known. Early subsidies, like Renewable Energy Target (RET) have done a great job at introducing renewable energy into the Australian grid and continue to do so. However, it is good to have a critical look at this scheme and learn from it.

Currently, the over-supply of solar energy in the middle of the day is frequently pushing the prices negative. This is possible because the solar generators can use the RET subsidies to compensate for the negative price on the electricity market. This makes the market as whole rather dysfunctional - as with any commodity, there must be a compensation for the goods sold and as a result of the negative prices the price of the following hours will be even more expensive. This creates hard-to-manage price risk, which increases the cost to the retailers and eventually to the consumers.

It is clear that this outcome was not foreseen at the time of designing RET and hence the mistake is understandable. However, repeating the same mistake with hydrogen now, when the writing is clearly on the wall, would be a serious oversight.

Solar is the cheapest form of electricity generation and hence a likely choice for producing green hydrogen, which is already under serious cost pressure to match the lower-cost fossil fuel based production. The same pressure would also encourage maximising the utilisation rate of the electrolysers, i.e. to produce as close to 24/7 as possible. Given that sunshine is only available about a third of the time, such a hydrogen producer would need to contract about 3-times the amount of solar it uses during the sun hours. Two-thirds of the solar generation underwritten by this hydrogen producer would go into the grid without a dedicated user and the electrolyser would continue to draw from the grid through the evening and night, exacerbating the solar challenge the grid is already struggling to manage.

Undermining the work done within the Capacity Investment Scheme

Question 26

The Capacity Investment Scheme (CIS) introduced by the Federal Government is addressing the challenge of managing variable renewable energy in the grid by encouraging long-duration storage projects that will time-shift the excess energy to times when it is needed. As explained above, if the HPTI only requires annual netting of the sourced renewable energy instead of hourly matching, it would further subsidise generation at the time when it is not needed.

It would be absurd to create a parallel subsidy that would worsen the problem that is already being corrected through public spending under another scheme.

Other design features

At Sunshine Hydro we have spent years developing the Superhybrid™ concept, that not only makes the business case for long-duration storage 'bankable', but also produces the products that are necessary for decarbonising the energy sector in the near future: 24/7 carbon-free electricity and green fuels.

Utilising the excess renewable energy is an essential part of the concept and hydrogen production has provided this flexible load for the Superhybrid™ asset ecosystem. However, as hydrogen is a challenging commodity to store, transport and distribute, we have researched various options for the hydrogen carrier.

Alternative hydrogen carriers

The analyses have informed our choice for path-to-market using green fuels, namely methanol and sustainable aviation fuel (SAF) as hydrogen carriers. Curiously, methanol contains more hydrogen (per volume) than hydrogen itself and it can be reformed back into hydrogen at the destination by adding water in a steam reforming process - resulting in more hydrogen than what is embedded in the methanol chemistry. .

We are bringing this to your attention so that you can carefully consider at what point the tax credit should be calculated. We propose to use the point of commercial transaction. For example, if the hydrogen is sold as methanol or other green fuel, the tax credit is determined based on the chemical composition, i.e. the hydrogen "carried" by the fuel, fertiliser or other chemical. If the transaction includes the reforming process at the destination, the tax credit would be based on the final product - though this would also require flexibility around the eligibility requirement related to the single site facilities.

It is also noteworthy that the hydrogen may be for self-consumption, like for electricity generation at the time of peak demand, which is why we propose to use the term 'point of commercial transaction'.

Alternative production methods

Questions 8, 10

As a consequence of choosing methanol as a hydrogen carrier, we use a process for combining hydrogen with a renewable carbon source. The set-up combines the processes for biomethanol and e-methanol to increase the flexibility of the facility and hence to enable a greater impact as a flexible load on the electricity market.

The final product, e-biomethanol, includes some hydrogen from the electrolyser and some from the biomass used as a carbon source. This is another reason why we propose the above-mentioned 'point of commercial transaction' as an unambiguous basis for calculating the hydrogen content of the production.

Minimum size of the production facility

Questions 3, 9, 10

Given the above described alternative carriers and production methods for hydrogen, we believe that using electrolyser size to determine the minimum project size can be difficult to interpret. We propose that it would be more straightforward to use the produced hydrogen amount - or the amount of the resulting tax credit as a cut-off measure.

While it is important to focus on large projects with large impact, we believe that small projects can also play an important role in a new market. These projects truly need the subsidies due to lack of economy of scale and may include:

- demonstrations that act as a necessary proof of concept for their large successors,
- small, innovative market entrants that may quickly grow to disrupt the industry, or
- staged projects that start small and grow with the market demand

To include such projects we believe that the minimum limit could be 250,000 kg of hydrogen or $500,000 tax credit per annum.

Community Benefits

Questions 16, 18, 19

To avoid repeating the mistakes of the past, it is important that the energy transition has a strong focus on inclusivity of the local communities and the First Nations people. There should be requirements related to local content, workforce and education. The eligibility criteria should also include considerations for impacts on local natural resources and biodiversity.

We welcome further questions and more detailed discussion related to these requirements, as well as the other proposals and feedback in this submission.