



BHP Nickel West Pty Ltd  
ABN: 76 004 184 598  
Registered Office:  
Level 43, Brookfield Place  
125 St Georges Terrace  
Perth Western Australia 6000  
GPO Box S1431  
Perth, Western Australia 6845  
T +61 8 6321 0111  
bhp.com

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Ms Kathryn Barrie  
Director, Infrastructure and Access  
Energy Policy WA  
Level 1, 66 St Georges Terrace  
Perth WA 6000

Sent via email: [EPWA-info@dmirs.wa.gov.au](mailto:EPWA-info@dmirs.wa.gov.au)

Dear Kathryn,

### **Renewable Hydrogen Target Consultation Paper Submission**

Thank you for providing an opportunity for BHP to make a submission to the consultation paper on the ***Renewable Hydrogen Target for electricity generation in the South-West Interconnected System (SWIS)***.

BHP Nickel West is an integrated mine-to-market nickel business that has mining and processing operations throughout the Goldfields, smelting operations in Kalgoorlie and a refinery in Kwinana - producing ~80-90kt of refined nickel annually. In October 2021, Nickel West opened its nickel sulphate plant at the Kwinana refinery in response to the growing demand for lithium-ion batteries used in electric vehicles. Today, more than 85 per cent of Nickel West's current production is now sold to the future-battery supply chain.

BHP is committed to pursuing the goals of The Paris Agreement and we are targeting a 30% reduction in scope 1 & 2 emissions by 2030 and net zero emissions by 2050. Nickel West is taking significant steps to reduce its greenhouse gas (**GHG**) emissions from its operations. For example, from calendar year 2024, Nickel West will have purchased enough renewable energy to cover 100% of its power requirements of its three major operations connected to the SWIS (i.e. Kalgoorlie smelter, Kambalda concentrator and Kwinana refinery). This will be achieved through Power Purchase Agreements (**PPA**) from the following:

- **Enel Green Power – Flat Rocks Wind Farm** – supplying Nickel West with the equivalent of ~315GWh per annum, located near the town of Kojonup.
- **Sun Energy – Merredin Solar Farm** – supplying Nickel West with the equivalent of ~130GWh per annum, located near the town of Merredin.

To support the decarbonisation of our other mining and processing operations, located in the Northern Goldfields that are not connected to the SWIS, Nickel West has partnered with TransAlta to develop the Northern Goldfields Solar Project – a large-scale onsite solar farm and battery solution – comprising of a 27.4MW solar farm at the Mt Keith operation, and a 10.7 MW solar farm with a 10.1MW battery storage system at the Leinster operation, displacing power currently supplied by diesel and gas turbine generation. Nickel West is also investigating the potential for wind farms and additional storage located at its remote operations.

With Nickel West securing its pathway to net zero electricity consumption, BHP is concerned that a renewable hydrogen target for electricity generation in the SWIS may add additional cost without due consideration of cost-effective alternatives to provide zero emission electricity (e.g. renewables, firming with batteries). These concerns are compounded by the relative inefficiency of electricity generation from hydrogen and that Western Australia is predicted to require substantial quantities of new renewable energy to replace existing non-renewable electricity generation and displace energy associated with transport fuels which are set to be electrified over the coming decades. This will require significant investment for both generation and transmission infrastructure to meet this increased demand.

Implementing a target that obligates the generation of electricity from renewable hydrogen, primarily to stimulate demand in support of the broader WA Renewable Hydrogen Strategy, is not technology agnostic and promotes an inefficient use of capital and resources for a comparatively inefficient and higher cost electricity generation. The consultation paper appears to understate the projected costs and is unclear how a target helps achieve the objectives of this policy, in particular its primary objective of 'industry development'. The volume of hydrogen produced from establishing a target in the SWIS will be inconsequential relative to the total volume of hydrogen expected from the numerous projects already proposed and will therefore likely have little to no persuasion over industry development.

Stimulating demand for a domestic hydrogen industry should not be at the cost to the consumers on the SWIS, who will likely pay through a higher cost of electricity, with negligible, or possibly negative, GHG benefit. BHP therefore does not support the introduction of a renewable hydrogen target for electricity generation in the SWIS.

Our responses to the specific questions raised in the consultation paper are provided for in Annexure A attached.

Yours sincerely

A handwritten signature in black ink, appearing to read 'J Farrell', with a large, stylized initial 'J'.

**Jessica Farrell**  
**Asset President Nickel West**

## Renewable Hydrogen Target – stakeholder feedback template

### Submission from BHP Nickel West Pty Ltd

This template has been developed to enable stakeholders to provide feedback on the questions posed in the Renewable Hydrogen Target consultation paper. Energy Policy WA encourage stakeholders to use this template. If you wish to provide additional feedback outside the template, wherever possible please reference the relevant question/section to which your feedback relates.

No.	Question	Feedback
<b>Renewable Hydrogen Target for electricity generation</b>		
1	What are some examples of an objective or objectives that could be used to assess the benefits, costs and impacts of a Renewable Hydrogen Target for electricity generation?	<p>Government should consider the levelised cost of energy generation from hydrogen into the SWIS required to meet the target and assess this against other technology agnostic decarbonisation scenarios. There are likely more cost-effective alternatives to achieve the objectives.</p> <p>Government should consider the impact on global electrolyser (or other hydrogen technology) learning curves and assess whether the cost of implementation of the scheme will deliver the market development benefits to sufficiently warrant the introduction of a government policy and the associated additional cost to consumers.</p>
2	How might other uses of renewable hydrogen be accommodated under a Renewable Hydrogen Target certificate scheme? How might Government otherwise support and/or encourage other use cases for hydrogen?	<p>Other uses may be accommodated through a zero-emissions hydrogen certificate scheme through the metering of electrolyser consumption matched with the retirement of equivalent large-scale generation certificates (LGCs).</p> <p>Should a green hydrogen target for electricity be implemented, the policy should allow for other users of hydrogen to participate on a voluntary basis to allow for potentially lower cost solutions in non-electricity sector uses to be developed. This may encourage greater competition within the scheme and further reduce the additional cost that the scheme is expected to impose on electricity consumers.</p>

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		<p>Consumers with a direct or indirect liability under the scheme should be allowed to access non-electricity based green hydrogen certificates without the scheme mandating the use of green hydrogen across other sectors.</p> <p>Government should consider whether by limiting technology to green hydrogen it is limiting the scope for other hydrogen users to develop alternative zero emissions hydrogen technology such as blue or turquoise hydrogen.</p>
<b>Considering hydrogen</b>		
3	<p>What role do you believe renewable hydrogen can play in the decarbonisation of electricity generation? To what extent will a Renewable Hydrogen Target for electricity generation in the SWIS assist in achieving the decarbonisation objectives of the State Government?</p>	<p>Renewable Hydrogen should not have a role in the decarbonisation of electricity generation unless it is commercially competitive relative to other technologies available to meet this goal.</p> <p>Where hydrogen may potentially have a role, if it is competitive, is towards securing the last mile decarbonisation to ensure a 100% reliable zero emissions grid. The SWIS is likely a decade or more away before it has to confront the last mile question.</p> <p>Hydrogen is one of numerous options for last mile decarbonisation, and consumer will decide which technology to adopt to eliminate emissions. Implementing a hydrogen target seems to imply a preferred technology that disincentivises alternatives which might be more cost effective.</p> <p>Hydrogen may provide the most value in support of decarbonisation for the hard to abate sectors - such as the petrochemical value chain, steelmaking and other industrial processes requiring high heat, and heavy-duty transport.</p> <p>If renewable hydrogen was deemed the best form of storage for the SWIS to achieve 100% decarbonisation, then this should be considered once renewable energy penetration in the SWIS is high enough to result in significant and frequent curtailment of renewable energy that would otherwise be lost to the system, which may incentivise hydrogen to be produced where short duration storage charging is not required.</p> <p>A renewable hydrogen target will have a negative effect on achieving decarbonisation objectives as it will require production of hydrogen from renewable sources that may otherwise directly displace fossil fuel-based generation on a more efficient basis. Further, a green hydrogen target is likely to</p>

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		<p>increase generation prices in the SWIS due to the high short run marginal cost of hydrogen. This in turn may sustain or extend the current generation mix in the short-term, resulting in a negative outcome of increased use of fossil fuels within the market.</p> <p>Given the current lack of new renewable project announcements on the SWIS, a green hydrogen target may serve to further dilute the available market for renewable energy to supply existing industries that must also decarbonise.</p>
4	<p>What role can the infrastructure associated with the production of renewable hydrogen (i.e. renewable electricity generation facilities, electrolysers, transport and storage infrastructure) play in the broader SWIS?</p>	<p>As highlighted in the briefing paper, infrastructure costs will be significant, thereby resulting in a high LCOE. The role the infrastructure will play in the SWIS is therefore a price increasing role, to the detriment of consumers, in particular those consumers who are progressing and/or achieving their own carbon reduction initiatives (i.e. consumers may be paying an additional cost for no direct carbon benefit).</p>
<p><b>Technical feasibility</b></p>		
5	<p>To the extent you are able please reflect on some of the technical issues, challenges and considerations in the utilisation of hydrogen in the generation of electricity. To what extent can these technical issues and challenges be overcome? How should this impact on the consideration of a Renewable Hydrogen Target for electricity generation in Western Australia?</p>	<p>There are numerous renewable hydrogen projects proposed in WA and in all cases, the use of H2 for power generation in WA does not appear to be a consideration. EPWA states that the primary objective of this policy is to establish a renewable hydrogen industry, however its participants seem to not identify power generation in WA as a key driver. This policy appears inconsistent with the market and may result in the SWIS based power customers paying for the development of a market that is not aimed at providing any cost or decarbonisation benefits to the SWIS.</p> <p>Technical challenges should not be a factor in the consideration of a hydrogen target – all participants face the challenge of meeting the requirements of the market in an economic manner. Stimulating demand for a single technology may be to the detriment of others that provide a similar or better products or services (e.g. low carbon electricity).</p>
<p><b>Certificate schemes for Renewable Hydrogen Target for electricity generation in the SWIS</b></p>		
6	<p>Do you believe a renewable hydrogen electricity generation certificate-based scheme represents an efficient and effective</p>	<p>A certificate scheme in general would allow for effective implementation. Consideration needs to be given as to how a renewable hydrogen certificate is</p>

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	means to deliver a Renewable Hydrogen Target for electricity generation in the SWIS? Please explain your answer.	<p>produced – i.e. will it require the retirement of LGCs against electrolyser consumption prior to the generation of the green hydrogen certificate?</p> <p>Should all LGCs retired be from renewable energy generation within the SWIS or within WA? How does the end user claim the emissions reduction benefit from the certificate scheme?</p>
7	What are some other approaches which could be considered alongside a renewable hydrogen electricity generation certificate scheme that would provide a framework to deliver on the objectives or outcomes sought?	No Comment.
<b>Liable entities</b>		
8	Is the proposed approach of certification, deemed liability and certificate transfer an efficient and effective way to deliver on the intent of the Renewable Hydrogen Target for electricity generation? Are there alternative approaches which could better deliver on the objectives?	<p>Yes – as has been established with the RET.</p> <p>If the objective of the scheme is to contribute to achieving decarbonisation objectives ostensibly through the use of renewable electricity, the government should consider whether a state based renewable energy target may be a more cost effective, and indeed a more effective, solution.</p>
<b>Exemptions</b>		
9	What are the benefits, costs and impacts of an exemptions regime for a Renewable Hydrogen Target for electricity generation?	The impact of an exemption regime includes an unintended consequence of penalising an industry's competitiveness in the international market, and whose competitors may not realise similar cost pressures as a result of policy decisions.
<b>Non-renewable hydrogen</b>		
<b>Renewable fuels</b>		
10	Should the Renewable Hydrogen Target for electricity generation consider alternative renewable fuels as eligible for	No comment.

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	the creation of Renewable Hydrogen Electricity Generation Certificate? Why or why not?	
<b>Setting a target</b>		
11	Please consider the benefits, costs and implications of a 1%, 5% and 10% Renewable Hydrogen Target for electricity generation in the SWIS on your business or industry, and provide commentary on how you would expect to react from a commercial and investment perspective to each target level.	<p>The cost pass through of this scheme, depending on design and allowance of exemptions for EITE industries, are likely to be incurred by Nickel West with no net benefit to its emissions profile.</p> <p>Nickel West has secured enough LGCs to reduce its scope 2 emissions for its SWIS connected operations to zero. To the extent that this scheme, through the retirement of green hydrogen certificates, would displace some of the LGC requirements of our operations for achieving zero emissions status, then cost would depend on the value of the hydrogen certificates being purchased against the value of the no longer required LGCs sold on the LGC market, alongside any increase in the average wholesale electricity price induced by this scheme. This likely to be at significant equivalent cost over and above Nickel West's purchase of renewable energy, acting as a cost penalty for no net emissions benefit to Nickel West.</p> <p>At 2024 LCOH prices as quoted in the briefing paper, NiW estimates that a 1% green hydrogen target would increase its electricity cost to the Kwinana Refinery by ~3.8% should full exposure be passed through, and a 10% target would be equivalent to a ~37.8% cost increase.</p> <p>The range based on 2030 prices is a ~2.5% increase for a 1% target to a ~24.6% increase for a 10% target, with no net emissions benefit being realised by Nickel West.</p> <p>In addition, the LCOH estimates provided by EPWA do not include any additional capital expenditure required by generators to retrofit or invest in new generation infrastructure to support hydrogen fuel use, nor does it include hydrogen transportation or storage costs. These costs could be significant, particularly as there is little global use of hydrogen for electricity generation presently, and therefore the cost price increase will likely be higher again than those quoted above.</p>

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12	At a whole-of-economy and / or sectoral level, what do you consider to be some of the benefits, costs and implications of a 1% target, a 5% target, and a 10% target?	This scheme is unlikely to induce global market cost reductions at scale, and may serve to crowd out existing electricity consumers looking to invest in renewable energy projects. This is considered against the scale of renewable projects required to decarbonise natural gas (and other process emissions) amongst SWIS customers that has already been identified to meet the Paris aligned goals.
<b>Target terms</b>		
13	Is the suggested approach of a medium term aggregate target, with annual entity targets, an efficient and effective means to achieve the objectives of the Renewable Hydrogen Target for electricity generation in the SWIS? Why or why not?	Yes, this is a recognised means of setting a pathway to meeting a target, similar to the RET. However, consideration would need to be given on the end date of the target and the likelihood for competitiveness post end date. A private sector participant may find it difficult to justify a business case (and receive finance) for an investment with a medium term timeframe but no prospect for competitiveness after the target ends. Alternatively, a private entrant would impose the levelised cost of generation over the medium term target as its long run marginal cost and therefore require a higher premium from the market to be competitive when compared to a long term target that gives greater certainty.
14	To what extent should banking and borrowing of liabilities be permitted under the scheme? What are the benefits and costs of a borrowing mechanism as described in the paragraph above?	Some flexibility often allows for unintended consequences to be mitigated, particularly in new schemes where technology is not necessarily proven at scale.
<b>Scheme commencement and ramp up</b>		
15	How soon do you believe a Renewable Hydrogen Target for electricity generation in the SWIS could be feasibly delivered from a technical perspective (i.e. if cost was not a consideration)? Please reflect on your own organisation and/or sector when providing your answer.	Could be achieved within 3-5 years if cost was not a factor and was coupled with existing or shovel ready renewable projects.
16	Similar to the above, how soon do you believe a Renewable Hydrogen Target for electricity generation in the SWIS could be feasibly delivered from a commercial or economic perspective (i.e. if cost was a consideration)? Please reflect on your own organisation and/or sector when providing your answer.	<p>The role of hydrogen in support of decarbonisation should focus on the hard to abate sector. Its role in the power sector should at best be towards the last mile decarbonisation of the grid. However, it will be competing with other technologies which could be more cost effective.</p> <p>We do not believe that a hydrogen target should be imposed on the power sector.</p>



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17	Over what period of time do you believe is an appropriate ramp up period for the Renewable Hydrogen Target for electricity generation in the SWIS? In providing your answer reflect on the actions your organisation and / or sector would need to take to participate in the scheme.	As above
<b>Hydrogen cost outlook</b>		
18	In the short (<5 years), medium (5-15 years) and long (15+ years) term, where do you expect the cost of production of renewable hydrogen to move from the estimated levels of today? What do you expect to be the drivers of this change?	<p>The primary drivers for green hydrogen LCOH are the cost of electrolyzers and the cost of renewable energy generated.</p> <p>Electrolyser costs have the greatest potential for improvement as they are less advanced on the technology maturity curve. Innovative ways of procuring renewable energy under high penetration scenarios may help to drive down energy costs.</p>
<b>Hydrogen demand and electrolyser capacity</b>		
19	To what extent do you believe the above scenarios are reasonable and achievable? Please explain your answer with reference to your previous answers regarding the objectives of the scheme.	The scenarios may be achievable but given the cost may not be considered reasonable.
20	How would you expect the levels of hydrogen demand for electricity generation in the SWIS to be met at various points in the supply chain? Would you expect a single generator would emerge and provide all certificates?	This depends on the size of the target relative to the economics of electrolyzers and the level of funding available. The level of liability amongst gas gentailer market participants may incentivise each to invest in required plant for integration amongst their portfolio, or it may be more economic to contract for either hydrogen or certificates from a single entity.
21	Would you expect one very large renewable hydrogen producer, a number of very small renewable hydrogen producers, or some other combination, to emerge in the State as a result of the scheme? Alternatively, would a domestic-focused producer have sufficient scale to operate in a domestic market only?	<p>Hydrogen producers with existing projects may be able to supply the green hydrogen required for generators to meet the target, assuming the price that can be achieved is competitive with their hydrogen export yield price.</p> <p>The scheme is unlikely to deliver sufficient volumes of hydrogen relative to the total size of hydrogen to be produced from projects already proposed to have an impact on consideration of scale compared to exports and therefore remains to be seen how this scheme assist in 'industry development'.</p>