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Friday, 18 August 2023

Mr David Fredericks
Secretary
Department of Climate Change, Energy, Environment and Water
Industry House, 10 Binara Street,
Canberra

Dear David,

Review of the National Hydrogen Strategy

Transgrid welcomes the opportunity to respond to the National Hydrogen Strategy review consultation paper (**consultation paper**) published by the Department of Climate Change, Energy, Environment and Water's (**DCCEEW**) on 7 July 2023.

Transgrid operates and manages the high voltage electricity transmission network in NSW and the ACT, connecting generators, distributors and major end users. We have an important role in managing one of the key parts of the Australian electricity system as it transitions to a higher renewables penetration and supports decarbonisation of other sectors, including through electrification and green hydrogen production.

We understand this review is seeking to ensure the National Hydrogen Strategy (**the strategy**) continues to position Australia on a path to be a global green hydrogen¹ leader by 2030. Transgrid considers that green hydrogen offers an exciting opportunity to decarbonise hard-to-abate sectors of the Australian economy that cannot be easily electrified and for electricity firming generation. We support the strategy's coordinated national approach to efficiently develop and integrate green hydrogen production into the electricity system.

In October 2021, Transgrid released our Energy Vision developed in collaboration with independent experts, CSIRO, ClimateWorks Australia and The Brattle Group.² This work guides our own long-term planning and supports other energy system stakeholders in formulating policies, reforms and investments that enable the rapid and orderly decarbonisation of our energy system. Our Energy Vision identified that:

- Australia's abundant renewable energy resources, large landmass, significant mineral ores and good access to Asian markets could set us up to become a clean energy superpower, exporting zero-emissions green hydrogen, green metals³, and other low-emissions products and services to the world.
- As the cost of producing green hydrogen from electrolysis falls, including through appropriate policy support, our modelling projected that renewable electricity becomes the dominant energy source for Australian hydrogen production.

¹ Green hydrogen is the production of hydrogen via electrolysis, powered by renewable energy.

² For more information on our Energy Vision publication – see [here](#).

³ Green metals and products refer generally to metals and products produced using renewable energy.

- Demand for electricity could surge in a clean energy superpower future, increasing the NEM's electricity requirements six times by 2050.

We provide feedback on the following three key aspects of the review:

1. Overall approach to update the strategy.
2. The importance of connecting green hydrogen projects to the grid.
3. Maximising value for consumers.

1. Overall approach to the strategy

We support the overall approach to update the strategy with specific targets and additional supporting measures as a response to the significant subsidies brought on by the US's Inflation Reduction Act. We consider it important that the strategy provides both:

- A long-term vision consistent with achieving net zero targets and ambitions for a large export-focused sector to help shape planning for future scenarios.
- Short term goals and targets supported by firm government policies and legislated mechanisms.

In the short-term, we support early funding targeted to encourage green hydrogen's use in existing domestic ammonia or steel production. This would bring on early investment and learning opportunities and contribute to decarbonizing the Australian economy.

For both short and long-term aspects of the strategy it is important that there is alignment with other jurisdictional hydrogen policies. This will ensure effective coordination across government and industry to deliver on the strategy's intent.

To ensure timely delivery of supporting network infrastructure, short and long-term hydrogen targets and any related targets set by the Government must be integrated into electricity network planning and energy market decision-making. This will ensure there is a clear and agreed actionable pathway to deliver the required supporting network infrastructure. To assist integration, hydrogen targets should be used by:

- The Australian Energy Market Commission's (AEMC) in its 'target statement'.
- The Australian Energy Market Operator's (AEMO) in its Integrated System Plan.
- Transmission Network Service Providers (TNSPs) in transmission regulatory revenue proposals and investment tests.

The base targets and associated firm legislated mechanisms should be applied across all scenarios in AEMO and TNSP long term system planning and in AEMC decision making. The aspirational long-term targets can be applied to higher emissions reduction ambition scenarios reflecting the increased levels of uncertainty over longer forecast periods.

2. The importance of connecting green hydrogen projects to the grid

We consider it desirable that any east coast green hydrogen industry be integrated with the National Electricity Market (NEM) as it allows flexible load and additional generation to support a secure and

affordable energy transition. Transgrid's Energy Vision identified that the lowest average electricity cost was seen in the clean energy superpower scenario due to synergies between flexible hydrogen production and reduced storage requirements.

Hydrogen electrolyzers can be extremely flexible, with the technical ability to turn down, off or even up near instantaneously (including up to 200% of capacity for 10-30 minutes). This enables them to closely track renewable production (including to soak up excess renewables that would have otherwise been spilt), and to provide demand response and grid balancing services (especially during times of grid stress). This flexibility and the significant amount of renewable generation built to supply production, if connected to the wider grid would significantly reduce the storage and gas firming requirements for the NEM – and lead to lower average electricity prices for all consumers.

Given the significant benefits available for connecting green hydrogen to the grid, we recommend that the strategy promote green hydrogen projects that are grid connected to enable these benefits to be tested and realised. To support this outcome, we recommend that this be an area of focus for the Australian Renewable Energy Agency (ARENA). This could be through a trial or knowledge sharing study that looks to address any barriers for green hydrogen projects connecting to the grid to explore connection, commissioning and registration related issues.

3. Maximising value for consumers

To protect the interests of consumers, we would support maximising consumer value to be a guiding principle in the strategy. This could help ensure that additional support provided to hydrogen projects is provided in a manner that preserves consumer interests. This could be similar to the NSW Government's hydrogen strategy which targets funding to projects that do not increase transmission cost burden for consumers.⁴

In defining this principle, it is important to consider whole of system costs and benefits in determining value for consumers. Our Energy Vision identified that the least cost solution for the whole system is to trade-off lower electrolyser utilisation to match production to renewable output. However, this is not necessarily aligned with early-stage green hydrogen developer business models which focus on achieving high electrolyser utilisation factors to minimise levelized hydrogen costs.

To help increase understanding and increase consumer confidence in the strategy, we recommend ARENA should be requested to explore the broader benefits to consumers of grid connected green hydrogen production. This could include:

- Flexible green hydrogen business models that trade-off high utilisation for other benefits (and policy mechanisms that could incentivize best outcomes for consumers).
- System wide benefits to the NEM if electrolyzers:
 - are registered and operated as a 'scheduled load'
 - provide market, ancillary and grid support security services

⁴ For more information on the NSW Government's application process for green hydrogen electricity concessions, see [here](#).

- locate in congested areas of the grid to soak up excess renewables that would otherwise be spilt and increase average utilisation rates of the network
- have co-located renewable generation to meet some or all of their electricity consumption needs whilst still maintaining a grid connection.
- Benefits of new flexible load improving system operators' abilities to manage minimum demand and ramping requirements related to increasing levels of rooftop solar.

Exploring and analysing these additional system wide benefits that flexible green hydrogen load could provide to a high variable renewable energy electricity system would help frame the strategy's long term thinking for the hydrogen sector. It will be important to communicate these effectively with industry and consumer groups to help the sector fully understand the costs and benefits associated with green hydrogen.

Closing

We would welcome the opportunity to further discuss the review of the National Hydrogen Strategy. If you have any questions on this letter, please feel free to contact me or Sam Martin at Sam.Martin@Transgrid.com.au.

Yours faithfully



Lance Wee
Acting Executive General Manager
Networks