



Australian Government

Geoscience Australia

22 July 2021

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Ms Tina Mrozowska

Administration Officer

Upper House Committees, Legislative Council

Parliament of New South Wales

Dear Tina,

Re: Hydrogen industry inquiry - Post-hearing responses - 21 June 2021 - Questions on Notice

Thank you for the opportunity to contribute to the inquiry into the development of a hydrogen industry in New South Wales. As requested, please find below answers to the questions on notice.

Q1 '... [what is] the amount of energy that is required to separate hydrogen from the water molecule? What are the different ways that amount of energy can be provided?'

Splitting water to make hydrogen requires a lot of energy. A large commercial scale electrolyser requires approximately 54 kilowatt hours (kWh) of electricity to produce one kilogram of hydrogen¹. For comparison, the average household in NSW consumes approximately 14 kWh of electricity per day². Depending on the location, a combination of wind and solar energy can provide high daily renewable electricity coverage to power an electrolyser (i.e. solar during the day with wind often at night).

Q2 '...what would the physical requirements be in terms of the amount of land that would be required, frankly, and what would be any other relevant considerations in terms of both the production and the storage of hydrogen?'

The amount of land required for a hydrogen production plant is much smaller than amount of land required to produce the electricity from renewable energy to power the plant. For example, the very large proposed 26 GW Asian Renewable Energy Hub project in the Pilbara region of Western Australia would occupy an area of 666,038 Ha³. The downstream hydrogen plant (including electrolysers, hydrogen storage tanks, ammonia plant, desalination plant and evaporation ponds) only occupies approximately 1200 Ha of this total project area.

¹ Based on technical specifications of the largest proton exchange membrane electrolyser in the world (70 MW Siemens Silyzer 300).

² ACIL Allen Consulting (2017) Energy consumption benchmarks: Electricity and gas for residential customers, 13 October 2017, ACIL Allen Consulting.

³ Department of Agriculture, Water and the Environment (2021) EPBC Act referral 2021/8891 - Asian Renewable Energy Hub Revised Proposal



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Yours sincerely,

Dr Andrew Feitz

Director, Low Carbon Geoscience and Advice