



THE UNIVERSITY
of ADELAIDE

Committee Secretary
Joint Standing Committee on Trade and Investment Growth
PO Box 6100
Parliament House Canberra ACT 2600

29 November 2022

Dear Secretary

Response to Inquiry into Australia's transition to a green energy superpower

The University of Adelaide's *Institute for Sustainability, Energy and Resources (ISER)* welcomes the opportunity to make this submission to the Joint Standing Committee on Trade and Investment Growth ('the Committee') and its Inquiry into Australia's transition to a green energy superpower.

ISER's mission is to lead globally transformative research that overcomes complexity, drives change, and creates value for a more sustainable future. ISER is home to some of the World's most successful and respected renewable energy researchers at The University of Adelaide, which the CSIRO has ranked as the most hydrogen intensive research university in Australia. ISER has established leadership and connections between academia and industry - *inter alia* through the Heavy Industries Low Carbon Transition (HILT) CRC, the Scaling Green Hydrogen and Copper for Tomorrow CRC bids and the Defence Trailblazer - and has a track-record of academic collaboration, spinout and growth with multi-national industries (e.g. Fortescue Future Industries and Sparc Hydrogen, BP, Petronas, BHP and Chevron). ISER's existing academic-industry collaboration nexus, together with bids in development, has already attracted indicative or actual cash and in-kind commitments totalling more than \$400M.

With respect to: *where trade and investment activities are already having a positive impact;*

ISER points to the opportunities arising from current projects announced in SA and other States. The CRC program is making a positive impact and we are confident that the National Reconstruction Fund will also. Australia should consider special trade zones or areas and specifically look at incentives for marine bunkering of green fuels as well as synthetic aviation fuels, and should ensure that investment into industries of the future is tied to investment into underpinning research to ensure that such industries can remain at the forefront of innovation.

With respect to: *emerging and possible future trends;*

The \$19 Billion Dollars of planned generation projects in SA alone, will deploy technologies that will invariably become out of date. Australia has the potential to become globally-leading in next generation future energy technologies and storage, as well as direct measures of generating hydrogen from photovoltaics and seawater, provided that trade and investment activities also resource research and innovation. The National Electricity Market (NEM) must be assessed for suitability to facilitate the clean energy transition. Without an update to the NEM's governance and regulation to better suit a clean energy transition, States and Territories may assess benefit in separating from it. The export potential for hydrogen as a

molecule will last a decade at best. It is better to export decarbonised commodities and value-added products from green hydrogen rather than the bulk molecule or some low-value derivative of it. The regulatory environment must be harmonised across the nation, especially for the hydrogen sector.

With respect to: *the role of key commonwealth agencies including Austrade, in identifying new trade and inward investment opportunities, and assisting Australian companies to access these opportunities, including through whole of government coordination of investment;*

Australia does not yet have a “go-to” energy transition institute that can inform, develop and demonstrate the transition and investment required across the Technology Readiness Levels (TRL) from basic research to industrial application. Such an Institute should establish an organisation responsible to Government and Industry that cohesively assembles future-focused capability across the TRL, and across all domains, including social science and system design to regulation as well as STEM. The Institute would deliver the necessary innovation to effectively deliver Commonwealth hydrogen strategies. It would work together with the already-funded CRCs, hydrogen hubs, clusters and research networks, to deliver the research, development, demonstration and translation required for a green and more complex economy. Australia should also consider a dedicated agency for energy, an Australian equivalent to the Department of Energy. Austrade could expand its focus on export of green goods or targeting existing supply chains where having green goods from Australia would improve Scope 3 emissions, and thereby incentivise greener products that are reliably sourced from Australian suppliers.

With respect to: *areas of growth, and how can these be accelerated and/or assisted, including through the use of Commonwealth Special Investment Vehicles; and how Australia can capitalise on existing and future trade agreements and economic frameworks with countries or regions around the world;*

As Australia strives to achieve net zero carbon emissions by 2050, energy derived from renewable sources will need to produce about 40 times the total generation capacity of today's national electricity market¹. There exists an opportunity to leverage Australian experience, resources and expertise to create a sophisticated industrial economy based on the transition required across the energy value chain.

As the world moves towards harnessing the environmental and economic benefits of renewable energies, hydrogen is rapidly emerging as a pivotal green energy source capable of contributing to local and international energy needs. Along with the significant environmental and industrial opportunities presented by the transition, are technology and market risks that will require identification and solutions creating Australian solutions for the storage, transport and distribution of hydrogen, because one solution will not address all challenges and current solutions are not fit for the scale required.

Australia must take leadership to:

- adapt and demonstrate hydrogen technologies from global settings to Australian conditions, working on specific solutions and local production;
- collaborate across electricity, water, chemicals, transport, infrastructure, and manufacturing sectors with systems approaches that help generate community license and co-ownership;

¹ Hydrogen and Renewable Energy Act Issues paper 2022, In Consultation

- link production of green hydrogen to domestic and international export markets such as for green chemicals, sustainable fuels and green-metals and products that utilise them, adding value to the renewable resource;
- grow a domestic green energy industry with local workforce, supply chains, standards and best-practice safety – expertise that also can be exported;
- attract and develop Australia's complex green industry small-to-medium enterprises (SMEs), emerging entrepreneurs, and the research sector to create a global Hydrogen Equipment, Technology and Services (HETS) sector anchored in SA;
- operate an Industry Demonstration and Translation Facility as a national test lab with activities in the regions, to accelerate research breakthroughs via industry into application;
- provide the foundation for the green energy know-how needed to increase the complexity of the economy, delivering not just green commodities but green products;
- expand capability to navigate unknown challenges and seize unforeseen opportunities as the energy system evolves;
- create an Institute (see above) that contains a globally-leading critical mass of 100+ key experts across Australia, in the future energy value chain (future production and storage systems, systems design, safety, economics, business models and the metallurgy and green mining required for the resources to electrify and decarbonise) through assembling, recruiting and developing the world's best renewable energy and resources fundamental and applied research talents and bridging them with international knowledge centres of research and innovation excellence;
- Encourage social license through community outreach and education across Australia.

ISER thanks the Committee for the opportunity to provide feedback on the Inquiry and stands available for continued engagement if asked.

Faithfully yours,

Professor Michael Goodsite
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Director, Institute for Sustainability, Energy and Resources (ISER)