Australia hydrogen energy storage

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Wind energy in Australia. This energy type is one of Australia"s main sources of ...

Solar power in Australia. Solar PV generated approximately 10 per cent of ...

Alongside the Clean Energy Finance Corporation, we published the Australian ...

Bioenergy in Australia. Bioenergy has scope to expand as an energy source in ...

On behalf of the Australian Government, the Australian Renewable Energy Agency ...

The utilisation of hydrogen is a key pathway for decarbonising Australia’s economy, particularly for hard-to-abate sectors like iron, steel, alumina, fertilizers, heavy road freight and long-haul transport (e.g. aviation and shipping). These industries are currently, heavily reliant on fossil fuels and cannot be easily electrified. In addition, for industries fossil fuels are an integral part of the manufacturing process (e.g. iron production). Today, entire new production processes using hydrogen are being developed to meet future emission standards.

In February 2023, the Energy and Climate Change Ministerial Council agreed to a Review of the 2019 National Hydrogen Strategy (Commonwealth of Australia, 2019) to ensure it positions Australia on a path to be a global hydrogen leader by 2030 on both an export basis and for the decarbonisation of Australian industries. The revised National Hydrogen Strategy will be released in 2024.

While hydrogen produced from renewable energy appears to have cost advantages in the long-term (IEA, 2023a), the production of hydrogen using fossil fuels with substantial carbon capture could be lower cost in the near-term. There are a small number of hydrogen projects using fossil fuels with CCS under development in Australia and these projects can provide additional assurance to buyers prioritising energy security in the near-term.

There are two primary methods currently available for producing clean hydrogen:

In 2022, global hydrogen usage continued to grow, reaching 95Mt (IEA, 2023b). The majority of all hydrogen produced globally is derived from fossil fuels, without carbon capture and storage, and is responsible for the emission of at least 920Mt of CO2 per year (IEA, 2023b). Current global production of clean hydrogen is minor (0.6Mt), accounting for less than 1% of all hydrogen production in 2022 (IEA, 2023b).

Current policy settings of governments around the world call for clean hydrogen production to reach 27–35Mt in 2030, while achieving Net Zero Emissions by 2050 requires approximately 80Mt of clean

hydrogen production in 2030. In 2023, the production capacity of all announced clean hydrogen projects globally amount to 38Mt in 2030, a year-on-year increase of 50% (IEA, 2023b). Some 3.3Mt of additional clean hydrogen production capacity globally is currently under construction or reached Final Investment Decision (IEA, 2023b).

Geoscience Australia provides open access to data sets and digital tools to assist governments and industry to assess Australia’s hydrogen potential. One of these tools is the Hydrogen Economic Fairways Tool (HEFT). Released in 2021, it helps policymakers and investors make decisions about the location of new infrastructure and the development of hydrogen hubs. The tool conducts detailed geospatial-economic analysis of future large-scale hydrogen projects and considers hydrogen produced by renewable energy and from fossil fuels with CCS. The HEFT tool was recently expanded to model the feasibility of Green Steel in Australia.