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## Pioneering underground hydrogen storage

On behalf of the Australian Government, the Australian Renewable Energy Agency (ARENA) has today announced \$2 million to Lochard Energy for an 18-month feasibility study into large-scale hydrogen production and storage in Victoria's onshore Otway Basin.

The feasibility study, costing \$6.3 million in total, is the second stage of Lochard's H2RESTORE project, which aims to help firm the National Electricity Market (NEM) through the provision of long duration, seasonal energy storage in the form of hydrogen.

ARENA CEO Darren Miller said the project is tackling one of the most challenging aspects of using renewable hydrogen as a form of long duration energy storage.

"Renewable hydrogen has an important role to play in helping Australia reach net zero, but cost-effective storage is a looming challenge for the industry. Solving the storage issue will be critical to enabling renewable hydrogen to be used as a form of long duration energy storage in Australia." Mr Miller said.

H2RESTORE is being designed to generate hydrogen by electrolysis using excess energy sourced from the NEM and storing it underground. The hydrogen can be converted back into electricity to supply the NEM when demand is high and supply is low.

Lochard has a history of supporting energy security and reliability in Victoria through owning and operating the Iona Gas Storage Facility near Port Campbell, Victoria.

The H2RESTORE project will look at repurposing some of Lochard's existing underground gas storage reservoirs in the long term to safely store hydrogen.

Repurposing existing underground gas storage assets could help bring down the cost of storage and store renewable hydrogen for longer duration, seasonal storage.

The feasibility study commenced in early 2024 with objectives to confirm technical feasibility of storing hydrogen deep underground in porous rock (sandstone), develop a concept design for an initial pilot facility, and progress planning, design and techno-economics for a potential commercial underground hydrogen storage facility.

The study builds on a pre-feasibility study conducted with CSIRO and Advisian in 2023, which resulted in a recommendation to progress to feasibility phase.

Lochard hopes the feasibility study will lead to the commercialisation of underground storage of renewable hydrogen, which could help with security of energy supply, firm power to the NEM and, if established, support further development of a hydrogen economy in Victoria, including the potential to supply reliable hydrogen to Power-to-X users.

Lochard's feasibility study and anticipated pilot facility are first-of-a-kind work in underground hydrogen storage in Australia.

ARENA will work with Lochard to share lessons from the project regarding feasibility of large-scale renewable hydrogen storage in underground gas reservoirs, the economics of hydrogen as a grid firming solution, social license considerations, skills, capacity, and knowledge.

Lochard's CEO, Tim Jessen, welcomes the support from ARENA.

"We are thrilled to receive this support from ARENA, which recognises the potential of the H2RESTORE project to transform the way energy is stored and utilised as Australia transitions to net zero emissions," said Mr Jessen.

"This funding will enable us to do the necessary studies to progress a pilot facility demonstrating Lochard Energy's capability to store hydrogen underground and provide support for the development of a large-scale commercial facility."

For more information on the H2RESTORE project, visit [ARENA's projects page](#).

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