

20 JULY 2022

World-first pilot to electrify calcination in alumina refining

On behalf of the Australian Government, the Australian Renewable Energy Agency (ARENA) has today announced \$8.6 million in funding to Alcoa of Australia Limited (Alcoa) to investigate and trial electric calcination in the alumina refining process.

Alumina refining is the process of turning bauxite ore into alumina, which is the precursor to aluminium. Alumina refining is an energy intensive process that traditionally relies on the combustion of fossil fuels for process heating.

As the world's largest exporter of alumina, Australia is well positioned to reduce global emissions from the alumina refining process. The alumina refining industry in Australia produces approximately 15 million tonnes of carbon dioxide equivalent per annum, or three per cent of Australia's greenhouse gas emissions.

Alcoa's main objective for the \$19.7 million project is to demonstrate the technical and commercial feasibility of using electric calciners powered by renewable energy to decarbonise the alumina refining process. This project will inform the commercialisation and technology development pathway for electric calcination technology and accelerate the decarbonisation of a hard-to-abate sector.

In Australia, approximately 70% of alumina refining emissions are produced in the low temperature Bayer process and 24% from high temperature calcination. ARENA has previously supported Alcoa to trial Mechanical Vapour Recompression (MVR) to produce high pressure steam using renewable energy for use in the low temperature Bayer process at their Wagerup refinery in Western Australia.

Integrating MVR with electric calcination and powering the process by renewable energy could potentially reduce emissions from alumina refining by about 98%. Additionally, electric calciners would allow significant amounts of residual energy, currently lost to the atmosphere as steam, to be captured and reused, reducing fresh water use by up to 70%.

Alcoa's electric calcination project will be delivered in two stages. The first stage will run until the end of 2023 and will involve the study, selection, engineering and testing of technologies. Subject to satisfactory completion of the first stage, the second stage of the project will begin in the first quarter of 2024 and continue into mid-2026 with detailed design, construction and pilot testing of this emerging technology at Alcoa's Pinjarra Alumina Refinery in Western Australia.

The Western Australian Government is also contributing \$1.7 million funding to support the project through its Clean Energy Future Fund.

ARENA CEO Darren Miller said the project was the missing link to decarbonising alumina production in Australia.

"As a significant exporter of bauxite and alumina, Australia has an important role to play in decarbonising this emissions intensive industry," he said.

"We are excited to be working with Alcoa again to reduce emissions in the aluminium value chain. This pioneering project will build on the work currently being undertaken by Alcoa on mechanical vapour recompression to accelerate the development of a low emissions alumina industry in Australia." he said.