

Hydrogen use for mining applications

Chile has known solar and wind power generation potential. Both are necessary resources for green hydrogen production. The country already has some 13.4 GW of renewable installed capacity, which supplies over 30% of the total national demand for electricity. Projects in the pipeline include an additional 52 GW of renewable generation. The maximum potential is estimated at 1,800 GW – equivalent to 70 times the total local demand.

At the same time, Chile is the leading copper producing country. Major global mining groups have large copper operations, mostly in the northern region. Those groups have publicly announced aggressive GHG emissions reductions, targeting net zero in the next decades.

Mining GHG emissions come mainly from their electricity consumption (off-set by renewable power purchases) and diesel consumption for large mining equipment. Over 1,500 mining trucks currently operate in the country, with about 950 gal of diesel consumption per day, per truck.

We see as an opportunity the replacement of diesel by green hydrogen in the mining trucks operations. GHG emissions can be significantly reduced at a competitive cost.

The electricity required for new, green hydrogen production will come from PV and wind projects. The source of water will have to be desalinated. This can be purchased from existing and planned projects in the area. The electrolyzers will be located near the power generation facilities, reducing the transmission costs and curtailments effect. The main mining truck supplier, along with engineering groups and mining companies, is already developing workable alternatives to convert existing equipment to hydrogen. Dual diesel-H2 operation and H2 fuel cells are being considered.

Our project will develop a robust storage and logistic chain for this new and fast-growing hydrogen demand. Storage at the production site, transportation to the mining operations and refueling stations to secure 24/7 operational needs and optimization will be included. Additionally, automatic refueling will be considered in order to reduce safety risks.

