

## Compressed air energy storage santiago

Chile's installed base of 64 megawatts and 79 megawatt-hours of storage (based on figures from BloombergNEF) is puny compared to the U.S. or China, for instance. But the country is already grappling with issues more commonly seen in much larger markets.

Chile has a long, narrow geographical footprint -- the country extends 2,653 miles from north to south, but is only 217 miles wide at its broadest point. As a result, most of its renewable resources are located far from areas of high electricity demand. This heightens the need for the buffer of energy storage to support weak interconnections across the country's southern, central and northern grids.

At the same time, the country's ambitious decarbonization plans, which include axing 65 percent of coal generation from its energy mix by 2025, have accelerated demand for the kind of long-duration storage assets that are only just beginning to emerge in more advanced markets.

One of the country's more eye-catching proposals is to convert coal plants to massive Carnot batteries, a type of thermal storage. This plan would see coal generation being replaced with molten salt thermal storage as the power source for steam turbines.

The concept has been in development since 2018, when Chilean consultancy Inod? carried out a study for German development agency Deutsche Gesellschaft f?r Internationale Zusammenarbeit (GIZ) on new uses for Chile's relatively young coal power plant fleet.

GIZ and the German Aerospace Center (Deutsches Zentrum f?r Luft- und Raumfahrt) have calculated that Chilean coal plant operators Engie and AES Gener could provide Carnot-battery-based energy at a cost of between \$80 and \$100 per megawatt-hour. That's flirting with cost-effective pricing against the primary shorter-duration energy storage from lithium-ion batteries.

These costs are still more expensive than coal-fired power, at between \$63 and \$76 per megawatt-hour, or natural-gas-fired generation, at between \$65 to \$91, but are still low enough to "open possibilities and private-sector interest in starting tests on the ground," local media has reported.

Vicente Javier Giorgio, chief operating officer for AES' South American operations, which include AES Gener, said the only thing missing is a regulatory framework to reward Carnot batteries not only for energy storage but also for providing grid inertia -- a key grid-balancing feature of spinning generators like coal- and gas-fired power plants.

"We want to take advantage of the coal plants we have, some of which are new, and carry on using the steam turbines, generating the steam from molten salt heated by renewable energy," he said in an interview. "But that

requires alot of investment."

To convert a250-megawatt coal plant to molten salt would cost around \$200 million, he said. "There needs to be an auction for assets that can provide inertia," he said. "If Iget acontract for 20years of inertia, then Ican pay off the investment."

AES Gener is no stranger to working with Chilean regulators on the evolution of the country"s energy storage market. The company was the first to introduce lithium-ion battery storage into the country, scoping the market in 2007 and installing an initial 12megawatts of 20-minute utility-scale battery capacity at its Norgener coal plant in northern Chile in2009.

AES Gener repeated this trick at two other northern Chile coal plants, installing 20megawatts of 20-minute battery capacity at the 554-megawatt Electrica Angamos plant in 2012 and asimilar volume at the 531-megawatt Cochrane Power Station in2016.

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