

AUSTRALIAN TECHNOLOGY MAY HELP GENERATE POWER FROM DEFUNCT GOLD MINES IN KOLAR GOLD FIELDS

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An Australian renewable-energy company plans to use gravity as a “fuel” to generate electricity in India’s iconic but now-defunct Kolar Gold Fields in Karnataka. Image for representational purpose only. | Photo Credit: The Hindu

An Australian renewable-energy company’s unique scheme to generate electricity may resuscitate the fortunes of one of India’s iconic but defunct gold mines, namely the [Kolar Gold Fields \(KGF\), in Karnataka](#).

A hiccup that makes renewable energy unreliable, from solar or wind power, is that there is no power during nights or windless days. Charging a battery to use as a backup during this downtime hikes power prices. While the common approach to addressing this challenge is to design them better, find more efficient conducting materials and install large battery farms to store power, Green Gravity’s idea is to rely on low-tech gravity.

Their plan is to find defunct mines, which often go hundreds or even thousands of metres deep, and haul a ‘weighted block’ — this could be as much as 40 tonnes — up to the top of the mine shaft using renewable power during the day when such power is available. When backup power is required, the heavy block will fall, under gravity, and the ensuing momentum will power a generator via a connected shaft (or rotor). The depth to which the block can slip can be determined via a braking system, thus giving control on the amount of power that can be produced.

The same principle underlies the so-called ‘pumped hydropower’ storage, a well-established approach where water from the ground is pumped upstream electrically into a reservoir. From here, when needed, water is released downhill to move a turbine and produce electricity, like in a hydroelectric plant.

Pumped hydropower, or even Green Gravity’s approach, may use more energy than produced but when accounting for being able to make renewable energy available at off-peak hours, can mean less reliance on coal-produced power and access to reliable power. Currently, India has installed about 4,746 MW of pumped-storage, according to figures from India’s Central Electricity Authority.

Using weighted blocks instead of water means that decommissioned mines can be put to use and the environmental costs and challenges of moving water up can be avoided, Mark Swinnerton, Founder and CEO, Green Gravity told *The Hindu*. “By using gravity as the fuel, we dispense with consuming the critical water, land, and chemicals which other storage technologies rely on.”

“At mines such as at Kolar, you can produce up to 100 or even thousands of megawatt-hours of power,” Mr. Swinnerton said. Some of the KGF’s deepest mines run nearly 3,000 metres. Operational for almost two centuries, the KGF mines — the world’s second deepest — has reportedly yielded nearly 800 tonnes of gold for 51 million tonnes of mined rock.

However, years of diminishing returns have led to the mines being abandoned for commercial prospecting. Gold apart, the mines have also been used in particle physics experiments where research teams have discovered elusive, cosmic particles called atmospheric neutrinos.

While the KGF mines have “potential”, more work is needed to establish if they are suitable for renewable energy production. Later this year, Green Gravity would begin their first test of the system in mines in Australia. Making the weighted blocks, designing and installing a braking system (to arrest their fall) and connecting it to the electric grids were the major costs of the enterprise. “Every mine shaft, on average, is expected to cost AU\$20-30 million (1 Australian dollar = 55),” he added.

Mr. Swinnerton has talked to officials at the Ministry of Mines as well the Ministry of New and Renewable Energy as well as tied up with researchers at the Indian Institute of Technology (Indian School of Mines), Dhanbad for funding to better assess the feasibility of the KGF mines. “The response has been encouraging and we hope to be able to start this next year,” he said.

(The writer is in Australia, courtesy the country’s Department of Foreign Affairs and Trade)

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