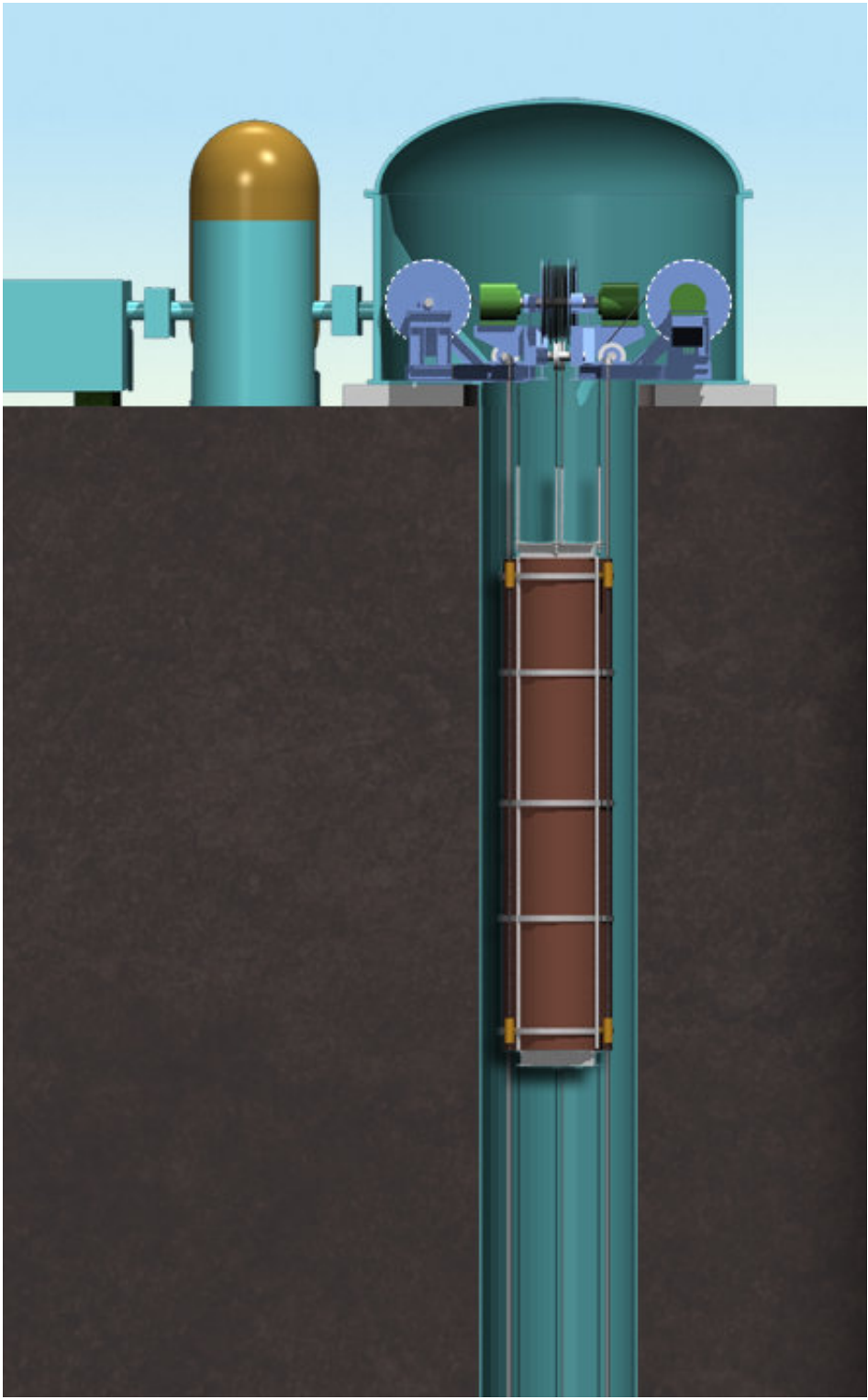


# Transforming old mine shafts into future storage sites

February 12 2018, by Nancy Owano

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Just as there is an interest in sources of energy, there is also an urgent keen interest in storage. What is viable, as in what can work efficiently and make economic sense?

"Companies around the world are pouring time and money into projects to develop large-scale [batteries](#) to store energy and release it when there is greater demand on the grid," said Greig Cameron, Scottish Business Editor, *The Times*.

That is one focal point, but an innovative company called Gravitricity, reported on this month by *The Times* and several other publications, thinks of another way to store energy.

Gravitricity Managing Director Charlie Blair: "So far there is a lot of focus on batteries, but our idea is quite different."

*Mining Technology* quoted him: "It's a simple case of 'What [goes](#) up, must come down'."

Its system can operate for decades without any reduction in performance. The company said the system had a 50-year design life with no cycle limit or degradation.

So what is their technology? They want to use old mine shafts for energy stores. These would be disused mine shafts transformed into energy facilities through a system that uses gravity and massive weights.

[ESL Africa](#) said that according to Blair, the company was "keen to speak with mine operators in South Africa" to understand how they might work together.

The technology operates in the 1MW to 20 MW power range. (Each unit can be configured to produce between 1 and 20MW peak power, with

the output duration from 15 minutes to 8 hours.) The company said their technology has similar advantages to pumped storage for networks up to 33kV, but it does not need any nearby mountain with a lake or loch at the top.

"A cylindrical [weight](#) of up to 3000 tonnes is suspended in a deep shaft by a number of synthetic ropes each of which is engaged with a winch capable of lifting its share of the weight. Electrical power is then absorbed or generated by raising or lowering the weight. The weight is guided by a system of tensioned guide wires (patents applied for) to prevent it from swinging and damaging the shaft. The winch system can be accurately controlled through the electrical drives to keep the weight stable in the hole." That is how the company explains what the system is about.

Time of response is impressive. The system should be able to respond to fluctuations in demand almost instantly. The company stated response time as "zero to full power in less than one second."

The company was awarded a £650,000 grant by the British Government agency Innovate UK.

A deep hole in the ground can be a disused mineshaft brought back into use, or a purpose-sunk shaft, said the company. Shaft depths can be from 150m for new shafts down to 1500m for existing mines.

Costs for such a system? Blair said the biggest single cost was the hole, "and that is why the start-up is developing their technology using existing mine shafts," said *ESI-Africa*.

The company said they will prove the technology using existing mine shafts. "As our [technology](#) costs decrease, the costs of drilling will reduce significantly, opening the opportunity for purpose-built shafts."

What's next? Stay tuned for 2020.

The company is [examining](#) a number of disused mine shafts in the UK and South Africa, said *The Engineer*.

The [company](#) said, "Over the 12 months from January 2018 we will be undertaking sub-system design and deploying a 250kW concept demonstrator. We aim to trial our first full-scale prototype in 2019 or 2020 at a disused mine in the UK."

**More information:** [www.gravitricity.com/](http://www.gravitricity.com/)

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