



Cheesecake Energy's eTanker system uses heat and compressed air to store energy | Photo source Cheesecake Energy

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STORING ENERGY IN THE FORM OF HEAT AND COMPRESSED AIR

 AGRICULTURE & ENERGY

A new system stores energy for long periods and is 30-40 per cent cheaper than lithium-ion batteries

Spotted: Technologies that can effectively store renewable energy are essential as the world transitions away from fossil fuels. To date, much of the focus and popular attention has been on lithium-ion batteries. But chemical batteries are just one way of storing energy. In fact, energy storage ideas come in all shapes and sizes with Springwise spotting a system that uses carbon dioxide and a seafloor system that works like a hydroelectric dam. Cheesecake Energy, a University of Nottingham spin-out founded in 2016, has developed another new system that uses heat and compressed air.

The spin-out's 'eTanker' storage system contains electric motors that are powered by the grid. These motors drive a compressor, which creates both pressurised air and a substantial amount of heat. Crucially, the heat and compressed air are stored separately. A thermal store captures the heat, while the air is held in an air tank where it cools down to ambient temperature. When the time comes to use the energy stored in the system, the process is effectively put into reverse. The heat in the thermal store is used to re-heat the compressed air which expands and drives a generator creating an AC electric current.

Cheesecake Energy is bullish about the potential of its system, describing it as 'the world's greenest battery'. And the novel approach offers a number of benefits, particularly over lithium-ion batteries. First is its durability. Lithium-ion batteries typically last around five to ten years and lose capacity over time. By contrast, Cheesecake Energy claims its system has a lifetime of 25 years with very low degradation. Second, the eTanker is a good solution for storing energy for longer periods. Cheesecake's Chief Commercial and Product Officer, Mike Simpson, explains, "Batteries are

fantastic for short bursts of power, but our system is great if you need power for four, eight, twelve hours at a time’.

The most attention-grabbing benefit of the eTanker, however, is its cost. The company claims that its system can achieve costs 30-40 per cent lower than the cheapest batteries currently on the market. If Cheesecake Energy is successful in scaling its technology, it could therefore have a significant impact on the energy storage market.

The spin-out is currently testing its prototype system and claims to already be in discussion with potential customers.

Other energy storage innovations spotted by Springwise include [sodium-ion batteries for off-grid communities](#), [home energy storage systems made from used EV batteries](#), and [a system that can hold solar energy for up to 18 years](#).

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Takeaway:

In addition to its durability and low cost, the eTanker avoids several of the long-term challenges that face lithium-ion technology. The system is made using abundant materials whereas lithium reserves are concentrated in a few geographic regions and must currently be extracted using [environmentally damaging processes](#). Moreover, the eTanker is designed to be easily recycled whereas the recycling rate for lithium-ion batteries is typically quoted to be [less than 5 per cent](#). Cheesecake Energy lists several potential applications for its modular system. These include industry, microgrids, renewable energy storage, and electric vehicle charging.