Storelectric Ltd

Enabling Renewables to Power Grids

Storelectric offers safe, clean and cost-effective energy storage at truly grid scale (Gigawatts and Gigawatt-hours).

Why is Energy Storage Needed?

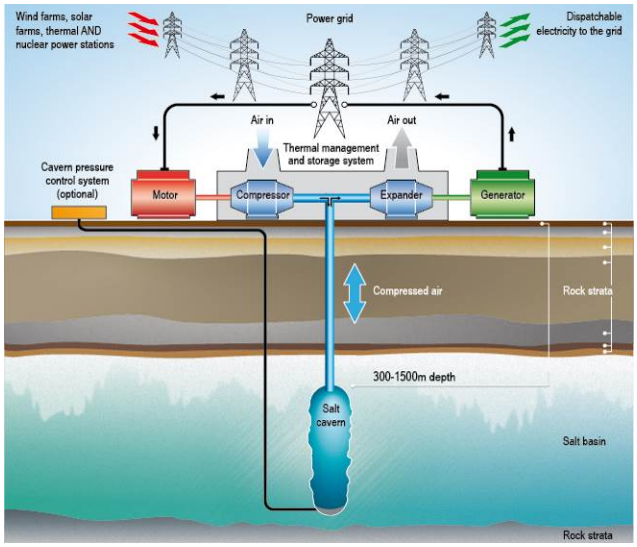
Natural resources such as wind and solar are unpredictable, only generating electricity when nature's conditions allow. This makes them unreliable and unsuitable for satisfying either baseload or variable demand, requiring costly back-up generation for when it is not available. They also have no natural inertia, so offer little grid stability.

- Storing renewable energy for use when needed improves their un-subsidised cost effectiveness and viability.
- Doing so with inertial systems provides cheaper and more efficient grid stability.
- Together with renewables, such storage greatly increases the profitability of both & reduces grid reinforcement.

Batteries cannot do this: their short plant life, too-low lifetime-average grid-to-grid efficiency, lack of inertia, resource scarcity for manufacture, small size and limited capacity make them suitable for only smaller-scale work.

Compressed Air Energy Storage (CAES)

Surplus low-price electricity is used to pressurise air, which is stored underground in very high capacity salt caverns, as much natural gas is currently stored world-wide. When needed, this air is released to regenerate electricity. It supports all generation technologies. Built in conjunction with renewables, it greatly reduces grid connection and reinforcement, and improves the profitability of both storage & generation. It is safe, far underground, and salt caverns are naturally hermetic and self-sealing. The application has been proven in Huntorf in Germany (from 1978) and in McIntosh, Alabama, USA (1991), which are both successful and safe, but only 42-54% efficient. Storelectric's plants will achieve close to 70% efficiency and up to 100% renewable, and provide grid stability. They can satisfy global energy storage needs: there are many suitable geologies globally.



Why is Storelectric different?

Storelectric's CAES can uniquely make both existing and renewable generation more profitable, dramatically cut emissions and provide complete and affordable energy security to countries and regions. The company is developing two CAES technologies: based on Thermal Energy Storage (TES) and dual-fuel (methane / hydrogen) CCGTs. A CCGT hybrid version is more efficient, lower emissions and more powerful than CCGT CAES.

	Storelectric TES CAES	Storelectric CCGT CAES	Storelectric CCGT Hybrid	Traditional CAES
Capex (all-in) for 500MW	£460m first, target £350m	£365m first, target £330m	£400m first, target £350m	£700m
IRR stand-alone, UK	31%, up-side potential	43%, up-side potential	57%, up-side potential	Low, some up-side
IRR with renewables	48% or higher	48%	62%	Improves IRR a little
Efficiency (grid-to-grid)	70%	57%	75%	50-54%
Emissions % of CCGT	0	~67% (CH_4) => 0 (H_2)	Depends on operating mode	~55-60%

All plants are low risk simplifications of existing plants using off-the-shelf equipment, well proven in other industries. TES CAES has been validated by Costain, Fortum, Mitsubishi Hitachi Power Systems (MHPS), Siemens, Mott MacDonald, Arup and others as delivering its intended services using standard technologies; a 40MW first-off commercial plant is planned for TES CAES. CCGT CAES is even more similar to a CCGT, so a small plant is not needed. Storelectric has a developing consortium of blue-chip multinational partners, with land and salt caverns ready to go, and supportive planning authorities. Both are simplifications of plants that have run for decades. Plants can be built throughout the world: suitable geologies are widespread, and others available in future. There is great interest in financing follow-on full-scale plants. Global market potential for peak smoothing alone is 3,500 large plants (>$1trn), with first-mover and technology advantages. Both Siemens and MHPS say that they can build them with their current range (others can too); MHPS say they would consider offing EPC performance guarantees.

The European Commission and ENTSO-E have approved as a **Project of Common Interest** a Cheshire 40+500MW TES project, meaning that it is important infrastructure at a continental scale, giving access to the multi-€bn Connecting Europe Facility and ECB funding for energy, & assistance with permits in all 35 member countries. Both technologies will be eligible for PCI status throughout Europe for future plants. See video.

