Making a 100% renewable energy future possible TODAY

Liquid Air Energy Storage: Clean, Cost-Efficient, Flexible and Reliable

Highview Power's CRYOBattery™ technology makes use of a freely available resource – air – which is cooled and stored as a liquid and then converted back into a pressurized gas which drives turbines to produce electricity. Just as pumped hydro harnesses the power of water, the CRYOBattery™ unleashes the power of air. It is the only long duration energy storage solution available today that offers multiple gigawatt hours of storage, is scalable with no size limitations or geographic constraints, and produces zero emissions. Our liquid air energy storage system delivers the lowest-cost clean energy storage solution for large scale, long duration applications.
The energy market is transitioning to renewable power—energy that is clean, but intermittent. Highview Power’s liquid air systems enable this transition by delivering performance and reliability equivalent to traditional sources of power while releasing zero emissions and storing energy for up to multiple weeks.

### Applications of Highview Power’s Liquid Air Systems

Highview Power’s CRYOBatteries™ are adaptable and can provide services at all levels of the electricity system: supporting power generation, providing stabilization services to transmission grids and distribution networks, and acting as a source of backup power to end users.

#### Power generation
- Managing intermittent renewable generation
- Energy arbitrage
- Peak shaving
- Improved heat rate
- Waste heat

#### Transmission
- Ancillary services
- Transmission constraints
- Inertia services
- Responsive flexibility services
- Voltage support

#### Distribution
- Reactive power
- Voltage support
- Local security
- Distribution losses

#### End users
- Power reliability
- Energy management
- Waste heat recovery
- Waste cold usage

*Source: Bloomberg New Energy Finance and Navigant*
Pulling energy out of thin air

How it works

Our patented liquid air technology draws on established processes from the turbo machinery, power generation and industrial gas sectors.

Stage 1. Charging the system
An air liquefier uses electrical energy to draw air from the surrounding environment, and then the air is cleaned and cooled to subzero temperatures until the air liquifies. 700 litres of ambient air become 1 litre of liquid air.

Stage 2. Energy store
The liquid air is stored in an insulated tank at low pressure, which functions as the energy reservoir. Each storage tank can hold a GWh of stored energy.

Stage 3. Power recovery
When power is required, stored heat from the charging system is applied to the liquid air via heat exchangers and an intermediate heat transfer fluid. This produces a high-pressure gas that drives a turbine and generates electricity.
How Highview Power's Liquid Air Energy Storage Compare

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Response</th>
<th>Expandability</th>
<th>Black start</th>
<th>Renewable</th>
<th>Efficiency (%)</th>
<th>Lifespan (years)</th>
<th>Scalability (MW)</th>
<th>Sustainability</th>
<th>Locatability</th>
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<tbody>
<tr>
<td>Liquid Air Energy Storage</td>
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<td>60–75</td>
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Other types of storage

For grid-scale, long discharge storage, Highview Power’s systems mitigate many of the constraints posed by other storage technologies. The CRYOBattery™ has a small footprint, uses no hazardous materials, has no associated fire risk and can easily meet strict urban building codes.

30-year Lifetime Levelized Cost of Storage

Significant cost decreases expected for CRYOBattery™ supported by an increasing standardization of the system and mass deployment

LCOS 50 MW System (50 MW-in and 50 MW-out 350 cycles/year)

Cost advantage vs. Li-ion improves with duration

LCOS reduction
At Highview Power, our mission is to unleash the power of renewable energy with clean, reliable and cost-efficient long duration energy storage. Founded in 2005, Highview Power built the world’s first liquid air energy storage plant and is now expanding globally. Using proprietary technology, our systems deliver pumped-hydro capacity and needed grid reliability. A standard plant configuration of 50 MW/500 MWh can be easily, and cost-effectively scaled up to multiple gigawatt hours without limitation. With Highview Power, a 100% renewable energy future is within reach.

Commercial partners and supply chain
We source the component parts of our technology from well-established OEMs to ensure that our plants have the best possible equipment in place, with proven lifetimes and performances.