

Hydrostor is re-envisioning compressed air storage

14 April 2017, by Nancy Owano



Hydrostor Advanced Compressed Air Energy Storage (A-CAES) demonstration facility, Toronto, Ontario. Credit: CNW Group/Hydrostor Inc.

(Tech Xplore)—Canada-based Hydrostor on Wednesday announced Hydrostor Terra, a bulk energy storage system. The company says the system competes head-to-head with new natural gas plants.

The head of the company stated, "Battery technologies can't compete with new [natural gas plants](#), but Terra does. The value proposition for utilities is compelling, and for us that's translating into projects."

This is about creating caverns on demand. The Hydrostor Terra system involves an isobaric underground cavern for air storage. It can be deployed at any site near a body of water. That includes inner-city and urban areas.

Greentech Media explained. The company digs what look like mine shafts customized to the needs of a given project. "The team installs silencers on the vents to cut out noise [pollution](#)."

The company says the result is bulk energy storage at half the cost of competing technologies.

They call the bulk energy storage technology Advanced Compressed Air Energy Storage, or A-CAES.

But first back to CAES. Prachi Patel in *IEEE Spectrum* turned to the fundamentals of CAES: "Such systems use off-peak electricity to run compressors and store the compressed air, which can later be expanded to drive a turbine." Only one problem—conventional CAES costs. Patel said it needs underground geological formations to store the air and it is expensive.

Greentech Media's Julian Spector also said, "Traditional CAES seals air inside pressurized salt caverns. So to build one, you have to go find a cavern big enough for your needs and strong enough to withstand the pressure without leaking."

This one uses utilizes hydrostatic pressure from a water-filled shaft to maintain a constant-pressure system during charge and discharge, which reduces the cavern size required as compared to traditional CAES systems.

(Patel said the underground cavern was built to operate at low and constant pressure. "The cavern has to be connected to a local water body via a pipe so that water can enter and leave the cavern as air goes out and in. The water in the shaft and cavity helps keep the air under constant pressure.")

"When charging," said the video notes, "compressed air is piped from the surface into the purpose-built accumulator, displacing water up the shaft and back to its source. Conversely, when the system discharges, compressed air flows back up to the mechanical equipment while gravity forces water to flow into the accumulator, displacing the air."

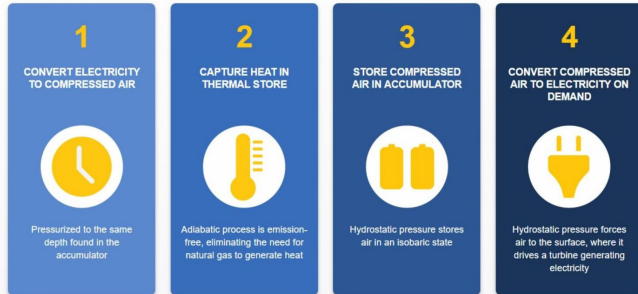
Who gains? The company said utilities and electricity system operators can cost-effectively and reliably address the issues of reserve capacity,

peak shaving, transmission congestion and renewables integration.

More information:

[www.prnewswire.com/news-releases-619264764.html](http://www.prnewswire.com/news-releases/619264764.html)

How A-CAES works



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How Hydrostor Advanced Compressed Air Energy Storage (A-CAES) works . Credit: CNW Group/Hydrostor Inc.

On the topic of cost, the company said this would enable "the transition away from fossil-fuel generation at half the cost of competing [battery technologies](#)."

Moving forward, Curtis VanWalleghem, President and CEO of Hydrostor, said, "We are engaged with several utilities around the world to deploy systems rated at hundreds of megawatts, delivering gigawatt-hours of [storage](#) at durations ranging from four hours up to multiple days."

According to Spector, "The Terra solution is highly customizable and allows customers to pick the power-to-energy ratio. For systems of 200 megawatts or more, VanWalleghem said, Hydrostor can deliver 6 to 8 hours of duration on a turnkey installed basis of \$150 per kilowatt-hour."

IEEE Spectrum discussed the Hydrostor concept of building underground caverns as an affordable approach in Compressed-Air Energy Storage.

Prachi Patel: "The case for storing large quantities of electrical energy is getting stronger and stronger, whether to expand the use of solar and wind power or to meet surges in demand on the [grid](#)."

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