HYDROSTOR

An Introduction to Hydrostor’s A-CAES Technology

Building an Advanced Energy Ecosystem in New Mexico
September 24, 2024

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Agenda

- Hydrostor at a glance
- The A-CAES process
- Procurement, projects and pipeline
- Q&A
- Additional slides

Hydrostor at a glance

Founded in 2010 | 80+ Employees | US $355M raised | 9+ Patent Families

Hydrostor is the global leader in Advanced Compressed Air Energy Storage (A-CAES). Our technology operates on a compact footprint with flexible siting to deliver utility-scale renewable energy storage capacity of eight hours or more where it's needed

Highlights

- Low-cost, large-scale and emission-free long-duration energy storage (LDES) with no augmentation required
- Based on proven CAES platform with grid-connected project operational at small-scale
- 700 MW of large-scale projects under advanced development with 400 MW commercially contracted
- Uses only water & pressurized air with standard equipment from proven supply chains
- Can be flexibly sited where the grid needs it, using 1/20th the water and land vs. equivalent size pumped hydro storage

Key investors:

Goldman Sachs | Asset Management

CPP Investments

The A-CAES process

1 **COMPRESSION**
Off-peak or renewable electricity powers a compressor that compresses the air and generates heat in the process

2 **HEAT EXCHANGE**
Heat generated during compression is extracted from the air and captured by the thermal management system for reuse

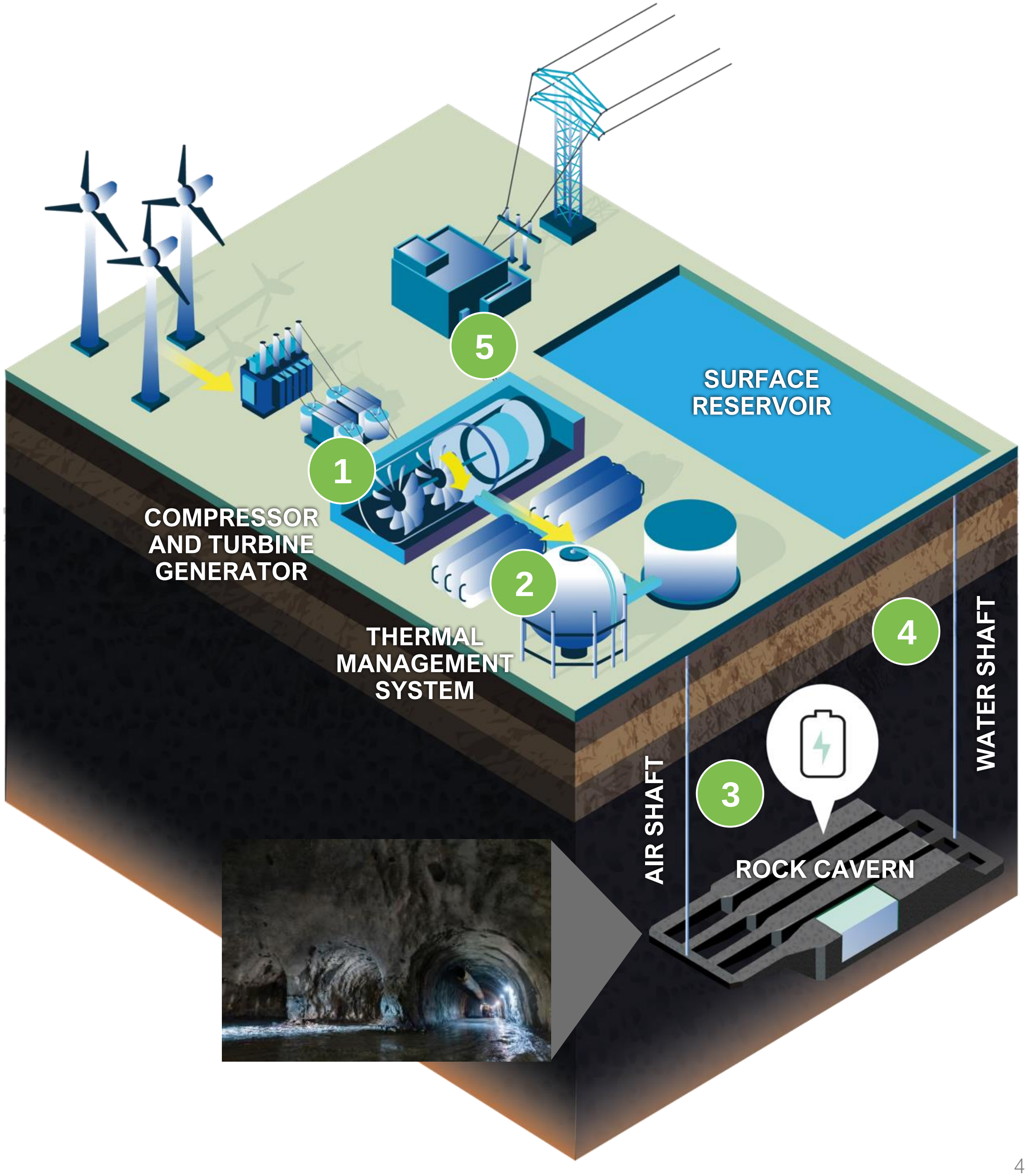
> **Hydrostor IP: Adiabatic heat storage** improves efficiency and makes the process emissions-free

3 **AIR STORAGE**
Compressed air is pumped down and stored in a purpose-built, water-filled cavern

4 **WATER DISPLACEMENT**
Compressed air displaces water, forcing it up the shaft to the surface reservoir

> **Hydrostor IP: Hydrostatic compensation** maintains cavern pressure, improves efficiency, and enables siting flexibility, minimizing cavern cost and size requirement

5 **FULLY CHARGED STATE AND DISCHARGE**
Once reservoir is filled, the plant is ready to provide energy on-demand by reversing the process and turning the above-ground turbine to generate electricity



Proven technology to support utility and grid transition to renewable sources

Renewables Integration: Manages intermittency of renewables and short-term variability of power grid

Replace Fossil Fuels: A long duration reliability solution to replace fossil fuel baseloads and peaker plants

Transmission Deferral: Non-wires alternative to defer electrical upgrades by reducing peak demand needs

Grid Stability: Synchronous technology adds grid inertia and reliability required in a high-renewables grid

Baseload Renewables: Supports net-zero targets for large electricity consumers by providing 24/7 renewables

Advanced-CAES improvements to Traditional-CAES

	TRADITIONAL-CAES	ADVANCED-CAES
Proven technology	Yes, >400MWs in service for over 50 years (multiple plants)	Yes, first commercial facility established in Ontario in 2019
Supply chain	Proven and established supply chain	Proven and established supply chain
Emissions	Emissions from burning gas to reheat air	100% emissions-free
Efficiency	Low round-trip efficiency	Adiabatic process increases system efficiency
Operating cost volatility	Cost volatility dependent on natural gas prices	Stable operating costs based on off-peak electricity rates
Siting flexibility	Limited location options due to salt cavern requirements	More flexible using hard rock caverns
Intellectual property	None	9+ patent families


290MW Kraftwerk Huntorf CAES Plant in Germany, operating since 1978


130MW McIntosh Power Plant in Alabama, operating since 1991


2MW Goderich Plant (Hydrostor’s first commercial A-CAES facility)

A-CAES vs other synchronous generation technologies

All technologies compared have minimal safety risks and robust industry supply chains.
Inputs provided below to facilitate required comparative analysis as needed.

	Key Indicators	Advanced-CAES	Gas Turbine	Traditional-CAES	Pumped Hydro
Standard Criteria	Technology Readiness Level	8 – 9**	9	9	9
	Size (MW)	200-500+	>100	150-500+	>100
	Duration (hours)	>8	N/A	>8	>8
	Round Trip Efficiency	60 – 65%	N/A	30 – 40%	70 – 80%
	Emissions	None	Emitting	Emitting	None
	Lifecycle (cycles)	>20,000	>20,000	>20,000	>20,000
	Siting Flexibility	Medium-High (Hardrock)	Low (Emissions)	Low (Salt, Emissions)	Low (Topography)
	Land Requirements (acres)	~100	30 – 40	50	>1,000
	Time to Deploy	Standardized, replicable <5 years construction	<3 years	4 years	Customized 7-10 years
Economics	Total Capital Costs (US$/kW)	$2,500 – $3,300	$1,000	$2,500 – $3,500	$2,500 – $4,000
	Total Capital Costs (US$/kWh)*	$250 – $330	N/A	$250 – $350	$250+
	O&M Costs (US$/kW-year)	$25	High (Fuel Dependent)	High (Fuel Dependent)	$24

*Based on 10-hour duration.
** All integrated subsystems rated TRL 9

A-CAES subsurface storage caverns

A-CAES cavern design is based on a century-old industry that is widely used by the world's leading energy companies.

History of subsurface storage

- Underground storage of gases commenced in 1915 and is widely adopted, with approximately **300+ commissioned storage facilities globally**
- A-CAES cavern development follows a staged, flexible process and presents **lower development risk** than caverns used in traditional mining
- Traditional mining must contend with whatever geology exists around an ore body, whereas **A-CAES can adapt to subsurface conditions** by adjusting cavern dimensions and location
- Estimates conclude that A-CAES can be used in up to ~50% of locations globally

Subsurface storage today

- Subsurface storage is common in both natural gas storage and CCUS processes
  - Natural gas is commonly stored in old natural gas fields, aquifers, and salt formations
  - CCUS stores CO_2 in reservoirs of porous rock under a layer of cap-rock
- **A-CAES can store a large volume of energy with an environmentally friendly process**

Major Subsurface Storage EPCs	LANE POWER & ENERGY SOLUTIONS, INC. · Geostock

Benefits of A-CAES cavern design

Low Volume Requirements	• Hydrostatic compensation, **enables full use of cavern volume**, making room for – or displacing – the compressed air in the cavern • Greatly **reduces required cavern volume**
High Siting Flexibility	• A-CAES **does not require a suitable salt formation** due to use of hard-rock caverns, providing orders of magnitude more potential project sites • **Up to ~50% of locations globally suitable** for A-CAES due to use of hard-rock caverns, increasing siting flexibility by 10x vs salt-based CAES
Long Asset Life	• Hard rock is highly durable and **does not degrade** due to air and water movements • Projects have long lifespans of **over 50 years and up to 50,000 cycles** and can be expanded at low marginal cost

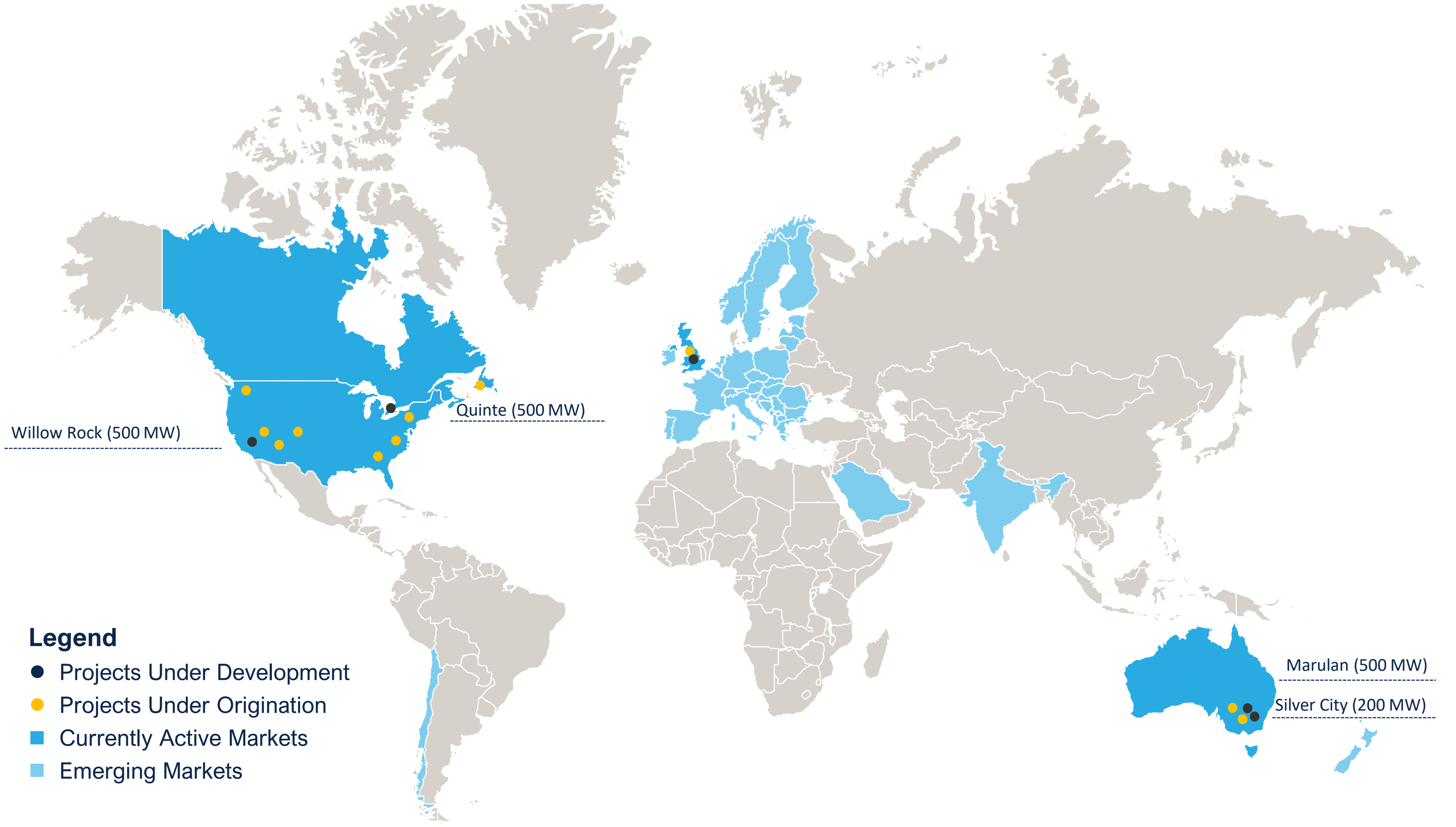


Procurement approaches in key markets

Hydrostor has worked with grid operators, utilities and policymakers to shape the procurement process in key markets, leading to a commercial pathway for LDES technologies.

	New South Wales	California	United Kingdom	New York	Ontario
Procurement Driver	Electricity Infrastructure roadmap requires 12 GW of renewable energy generation and **2 GW of LDES** to achieve clean electricity targets	**MTR:** CPUC required **1 GW of LDES** by June 2028 (can delay to June 2031) **CPE:** CPUC required **1 GW of LDES** and 1 GW of MDS between June 2031 & June 2037 Procurement to support SB100, 100% clean electricity by 2045	Energy Dept., Regulator (Ofgem), and Grid Operator have not set yet legal target, reports est. >6 GW in 2030s	Storage roadmap procuring 6 GW, including a carveout of 600 MW for LDES plus an additional 4 GW need for LDES by 2035.	Long-Term 2 Long-Lead Time procurement for up to 1 GW of LDES to support capacity needs by 2035.
Bid Evaluation and Requirements	• 8+ Hours Duration • Term: 14-40 years • Criteria: Impact of Project on Market Prices/ Economic Dev/First Nation.	• 8+ Hours Duration (12+ Hours Duration for Central Procurement) • Term: 25 Years (generally) • Criteria: Price + Risk/Technology/Execution Capabilities	• 6+ Hours Duration • Batteries Ineligible • Term: up to 25 years • Two Streams (TRL 8/9) • Criteria: Dev Status/ Economics/ Market Impact	• 8+ Hours Duration • TBD as order announced in June 2024	• 8+ Hours Duration • Term: 40 Years • Criteria: First Nation's Participation and Municipal Support Rated Criteria
Contract Structure	Top-Up Annuity Payment in addition to market/ operating revenues (NSW has strong operating energy market)	Tolling Agreement Capacity Payment Capacity Payment + Energy Settlement	Cap-and-Floor Contracts in addition to market/ operating revenues (i.e., Day Ahead, Capacity Market, Arb.)	Index Storage Credit which references price for Energy Arb and Capacity	Capacity Contract with supplier retaining market revenues.

Active and growing 7,000 MW project pipeline



North America

- Willow Rock ESC (Site, LGIA, Offtake Contract)
- Quinte ESC (1 Project: Site Secured, IA Q1 2024)
- California (3 Projects: 1 Site Secured, 3 IA Submitted)
- New York (3 Projects: 2 Sites Secured, 2 IA Submitted)
- Southwest (7 Projects: 1 Site Secured, 7 IA Submitted)
- Pacific Northwest (Screening Complete)
- Southeast (Screening Underway)
- Eastern Canada (Screening Underway)

Australia

- Silver City ESC (Site Secured, Offtake Contract)
- Marulan, NSW (Site Secured, MOU Underway)
- Victoria (Screening Complete, Site Exclusives)
- South Australia (Gov't providing target parcels)

Other Countries

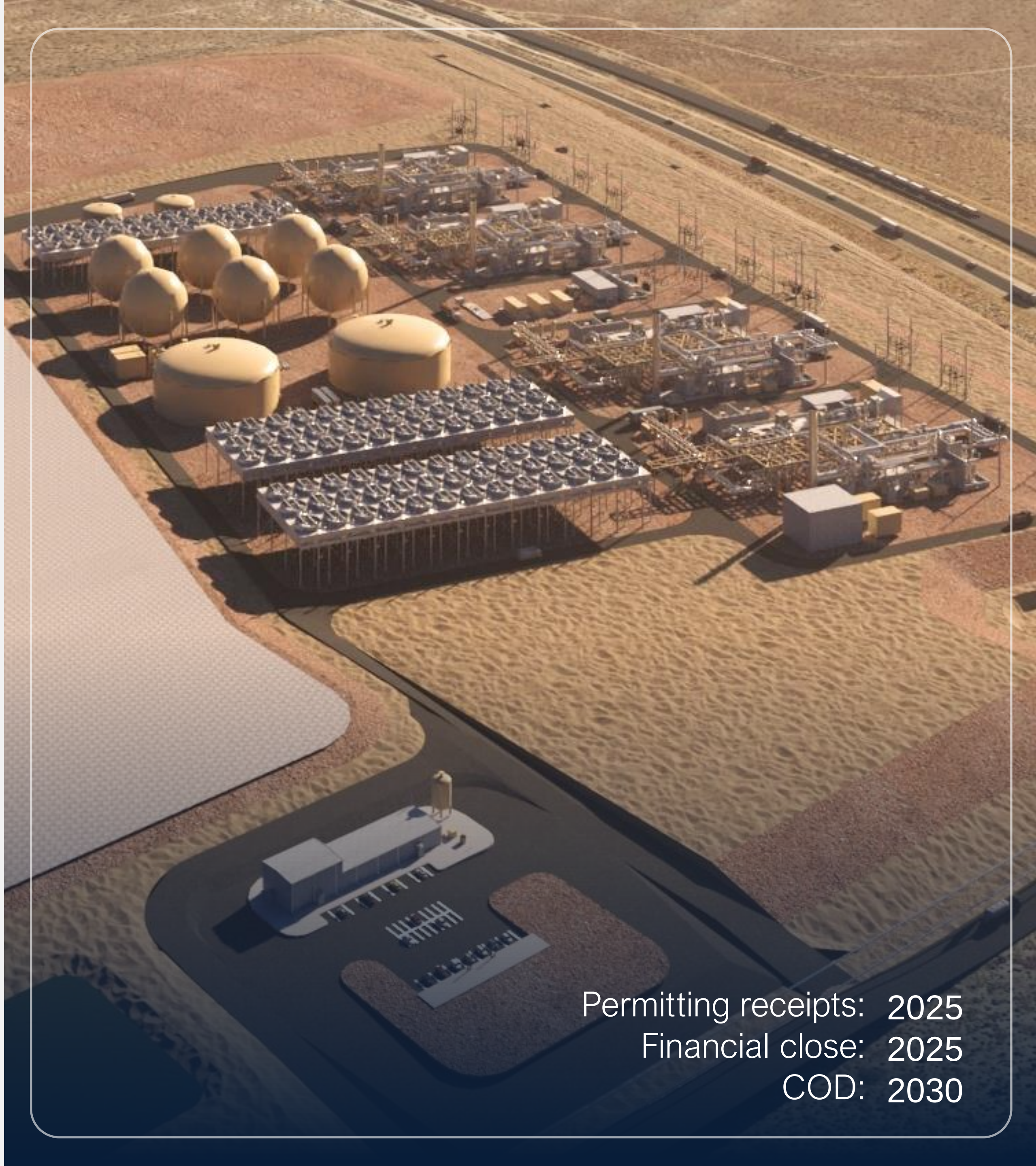
- StrataStor (Paused)
- United Kingdom (New Sites Screening in Progress)

WILLOW ROCK
ENERGY STORAGE CENTER

NW of Los Angeles – California, USA

500MW project in Kern County that has been selected/ shortlisted to provide half of California's mandate for 1 GW of 8-hour LDES to meet MTR requirements.

Ownership:	100% Hydrostor
Site:	Secured
Offtake contracts:	3CE (200MW) Shortlisted (300MW) Total engagement (850MW)
Interconnection:	Yes (500MW)
Permits:	Application submitted
Project debt:	Potential government loan ITC bridge loan



HYDROSTOR

Q&A

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Additional slides

Hydrostor leadership and advisors

LEADERSHIP

Curtis VanWalleghem
CEO, Co-Founder, Board Member

Jon Norman
President

Jordan Cole
Chief Commercial Officer

Beth Summers
Chief Financial Officer

Sarah Skinner
Chief HR Officer

Tom Duckett
Chief Development Officer

Chris Phebus
Chief Technology Officer

Patrick Moyer
General Counsel

Scott Bolton
EVP - Global Policy & Regulatory Affairs

ADVISORS

Judith Johansen
Director, Hydrostor

David Hayes
Special Assistant to the U.S. President for Climate Policy

Richard Glick
Former Chairman, U.S. Federal Energy Regulatory Commission

Fong Wan
Advisor to Management, Hydrostor
Former PG&E Executive

Tony Meehan
Advisor to Management, Hydrostor
Former TransGrid Executive

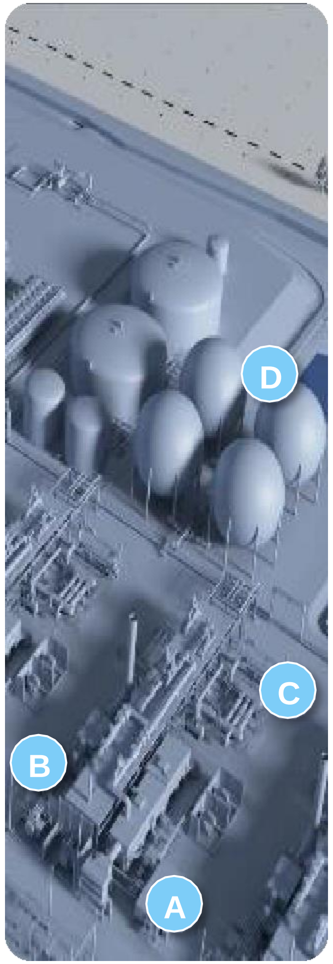
Rogers Herndon
Executive Advisor, Hydrostor

Supply chain tier 1 OEMs

A-CAES Core Components are entirely based on well-proven and deep supply chains for all systems. Available performance guarantees for project finance and supplier backstopping of delivery and performance.

Equipment	Key Characteristics	Vendors	De-risked Supply Chain
A **Compressor**	• A-CAES systems employ highly efficient compressors that are widely used in the oil and gas and industrial processing sectors • Compressors use standard electrical motors • Many tier-one OEMs manufacture these compressors globally	Atlas Copco, Siemens Energy, Baker Hughes, MAN Energy Solutions	✓
B **Turbines**	• A-CAES utilizes highly efficient turbines to extract the heat stored in the air during discharge • Widely used turbines require only slight modifications for A-CAES • Connected to standard electrical generators • Global supply chain of highly experienced turbine vendors	Baker Hughes, MAN Energy Solutions, Mitsubishi Power, GE Power, Siemens Energy	✓
C **Heat Exchanger**	• Heat exchangers transfer heat between the compressed air and water in the thermal management system • Available from a broad set of experienced vendors	HRS heat exchangers, Superior Boiler Works & Welding Ltd., Alliance Fabricating Ltd, Therco-Serck	✓
D **Thermal Storage**	• Two types of tanks used for thermal storage: 1) High-pressure insulated tanks store heat captured during compression 2) Low-pressure, uninsulated tanks to store water once it is cooled • Both types of tanks are widely available from a range of vendors	Entrepose, CB&I, Matrix Service	✓

Condensed Footprint



A-CAES performance specifications

Performance Metric	Metric Detail	Performance
Efficiency	Round-trip efficiency (AC-to-AC) at grid connection point, including all auxiliary loads, assuming daily cycling at full power rating	60-65%
Response Time	Charge – signal to full power, per compressor	10 minutes
	Discharge – signal to min. load point	<5 minutes
	Discharge – signal to full power, per turbine	10 minutes
Ramp Rate	Ramp rate of power generation during operation	1%/second
Minimum Load Point (MLP)	Minimum discharge level that can be sustained per turbine	10%
	Minimum charge level that can be sustained per compressor	90%
Minimum Run Time	Though not a technical limit, minimum amount of time to discharge/charge recommended to maintain efficiency	1 hour
Minimum Down Time	Minimum amount of time to stay offline after any shut down of charge or discharge	5 min
Reactive Power Delivery	Voltage support provided with reactive power during charge / discharge	0.5 MVAr/MW
Lifetime	Equipment service life with recommended maintenance	50+ years
	Cycle-life of rotating equipment between major overhauls	7,000 cycles
Degradation	Degradation over useful life of the project	0%
Inertia	System Charge, per compressor	8.4s
	System Discharge, per turbine	3.6s
	Optional Clutched Condenser (additional reactive power, inertia, system strength)	--

SILVER CITY
ENERGY STORAGE

Broken Hill – New South Wales, Australia

Precedent setting project that is providing transmission reliability service with a 200MW, 8-hour (1,600 MWh) long-duration storage project.

Ownership:	100% Hydrostor
Site:	Secured
Offtake contracts:	TransGrid agreement LTESA contract Retailer (active negotiation)
Interconnection:	Yes (200MW)
Permits:	EIS submitted
Project debt:	Soft commitments (ED SMBC)
Grant:	ARENA (A$45 million)