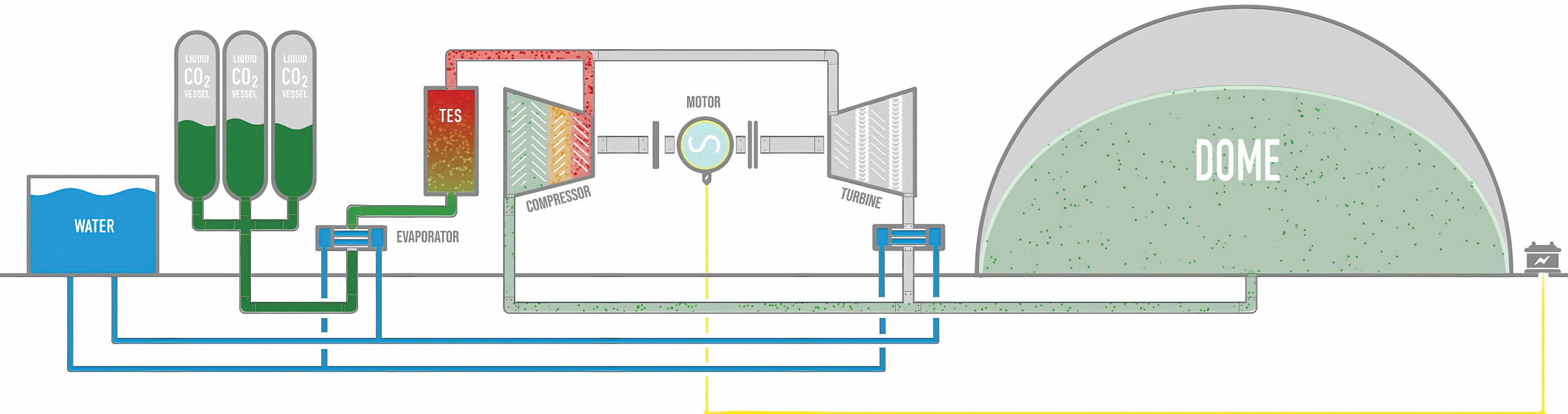
LDES National Consortium Workshop 2024

Eric Watson, Director of Sales, North America

ENERGYDOME

Our WORLD can't wait.



CHARGE

ENERGYDOME

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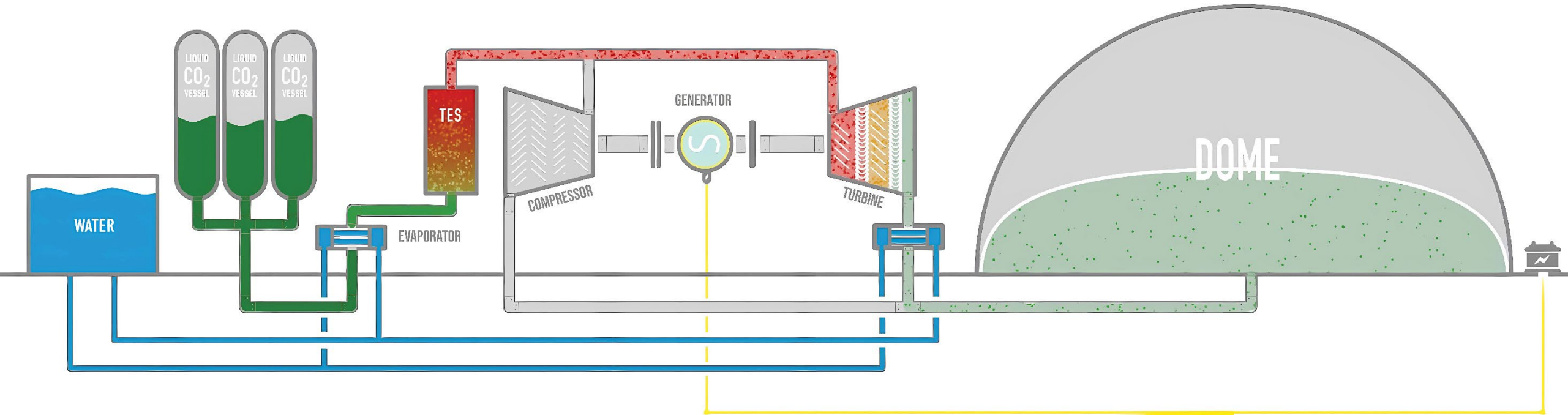


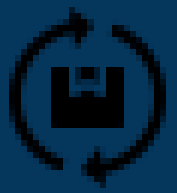
DISCHARGE

Why CO2?

CO_2 can be stored as a liquid at ambient temperatures in carbon-steel pressure vessels, no cryogenics or chillers needed

CO_2 is a clean fluid. In comparison, air needs to be filtered/managed for pollutants and needs moisture control, CO2 in closed loop doesn't need conditioning

CO_2 is not corrosive or erosive. Ideal for turbomachinery, less maintenance needed relative to operating similar machinery with air.



CO_2 is widely available. No need for rare earth metals or electrolyte

ENERGYDOME
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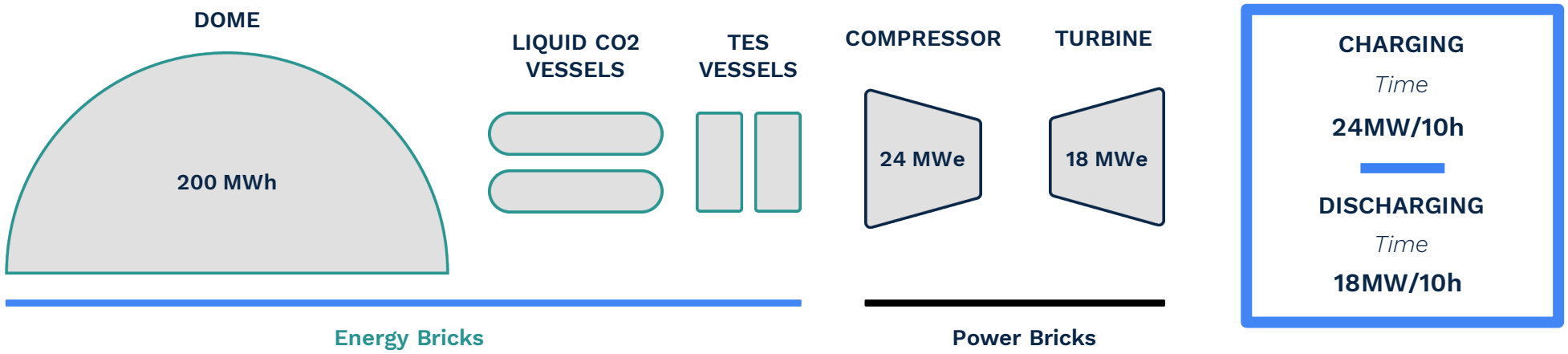
Long Duration, High RTE, Low Cost, Ready-to-Build

Standard Configuration

20MW/200MWh Frame



Site-Independent Design (Wind resistance, snow load, seismic)

WE HAVE BEEN READY SINCE JUNE 2022

First 2.5MW Plant successfully operational and Grid Connected for over 2 years

Over 2 years of plant operation have confirmed:

- Maturity of the technology
- Performance validated by

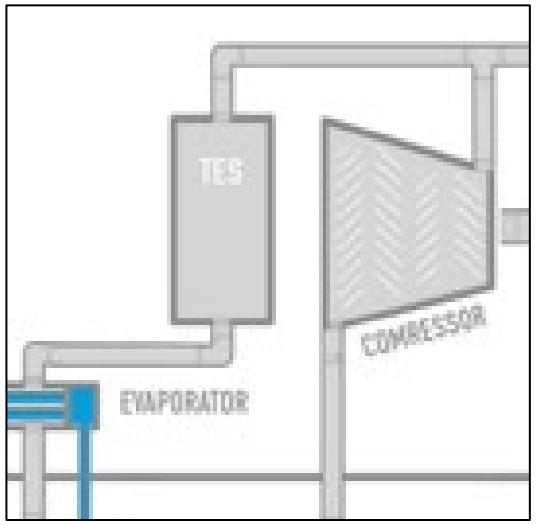
FICHTNER

EPRI

MAN Energy Solutions

POLITECNICO MILANO

Thermal Energy Storage System (TES), Designed by Energy Dome, TRL 7+



Efficiency/Performance maximized via recovery of heat of compression in the TES system

Our Solution = Packed Particle Bed using inert material

- No moving parts, completely recyclable
- Highly efficient, on expansion CO_2 after the TES is only 5°C less than the original inflow from the compressor

Lab Scale Testing with Politecnico of Milan in 2021

POLITECNICO
MILANO 1863

FIRST FULL-SCALE CO2 BATTERY

Commissioning in Q4 2024. Location: Ottana, Sardinia, Italy

Commercial Demo Plant
2.5 MW – 4 MWh
Completed: June 2022

Standard CO2 Battery
20 MW / 200 MWh
Status: In Construction

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FIRST FULL-SCALE CO2 BATTERY

1. 99% of all equipment has been ordered. 18 MW Turbine is in transit. 24 MW Compressor has been delivered.
2. Foundations, anchors, and all civil works are nearing completion.
3. Mechanical assembly of the dome has begun. Inflation expected in September.
4. Transformer has been manufactured and successfully tested.
5. First funding tranche from Breakthrough Energy Ventures has been unlocked
6. On-Track for system-wide commissioning in Q4 2024. Operational data and commercial operation to follow shortly.

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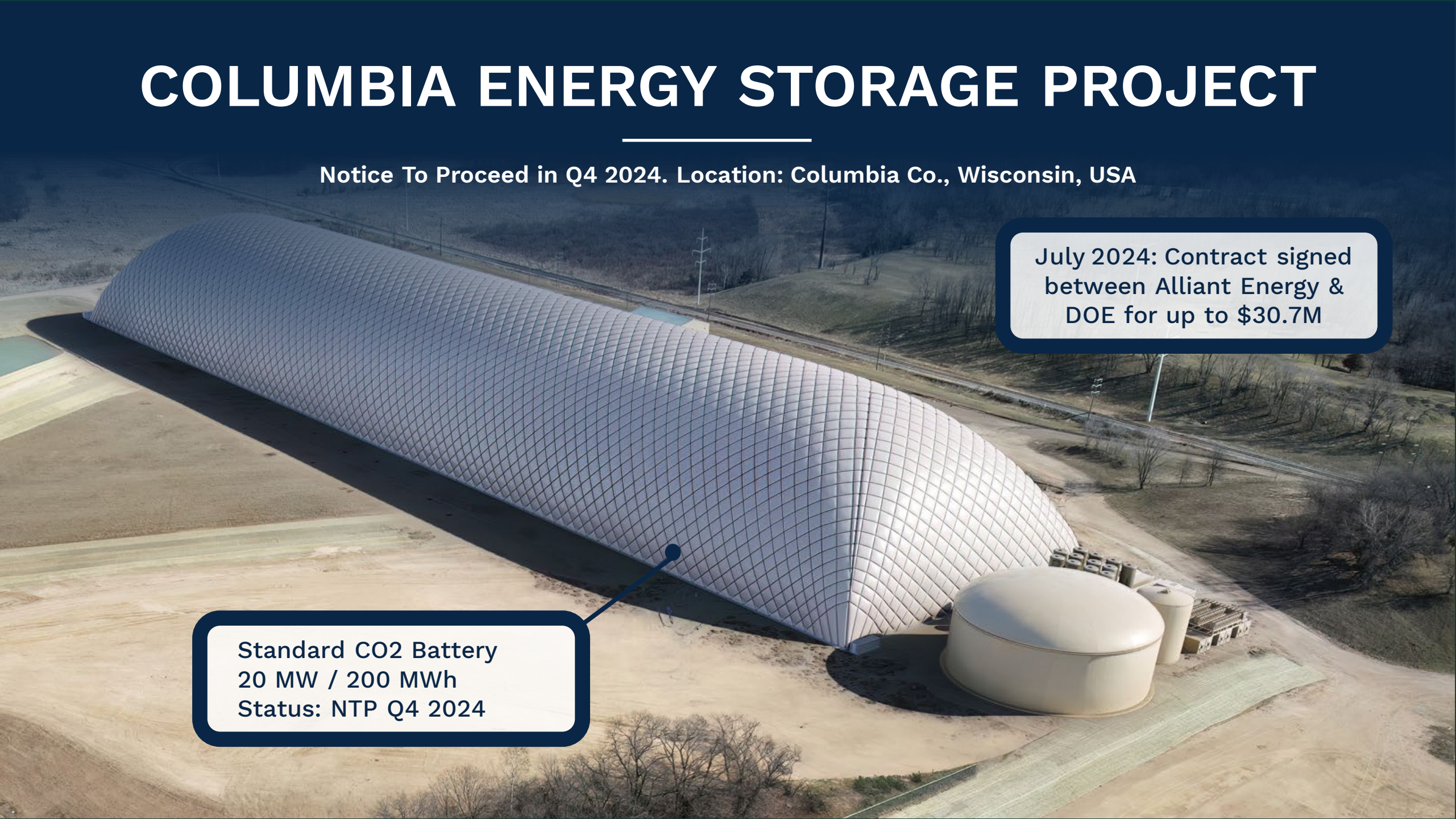
COLUMBIA ENERGY STORAGE PROJECT

Notice To Proceed in Q4 2024. Location: Columbia Co., Wisconsin, USA



July 2024: Contract signed between Alliant Energy & DOE for up to $30.7M

Standard CO2 Battery
20 MW / 200 MWh
Status: NTP Q4 2024

Full-Scale Plant – Wisconsin

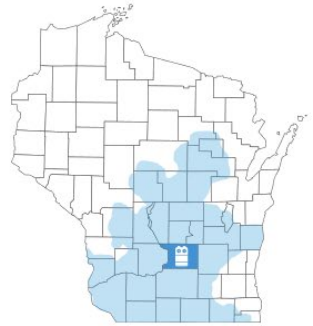
- 20MW / 200MWh
- Partnership with Alliant Energy in Wisconsin
- Operational by 2027
- Selected by US DOE for 50% cost-share
- Installed on a retiring coal facility in WI
- US supply chain for ITCs and cost reduction

DOE: Columbia Energy Storage Project

Long-Duration Energy Storage Demonstrations Projects Selections for Award Negotiations

Office of Clean Energy Demonstrations

Alliant Energy and its project partners, including WEC Energy Group, Madison Gas and Electric, UW-Madison, Madison College, Shell Global Solutions US and the Electric Power Research Institute, are teaming up to construct one of the first carbon dioxide-based energy storage systems in the United States, in Wisconsin.



Alliant Energy Powering Beyond · WEC Energy Group · mgoe Madison Gas and Electric · EPRI Electric Power Research Institute

The CO2 Battery is highly competitive against other storage technologies

	CO2 BATTERY	Lithium-Ion Battery	Pumped Hydro	CAES
BOP RTE	75%	80-85%	~70-75%	60-62%
EOP RTE	75%	68-73%	~70-75%	60-62%
CAPEX	$225-$250/kWh	Highly volatile, $350/kWh	Highly dependent on site conditions	Highly dependent on site conditions, FOAK COD still far away
LIFETIME	30+ y	10 y	50 y	40 y
TIME OF IMPLEMENTATION	1 – 2 y	1 – 3 y	5 – 7 y	5 – 7 y
SUPPLIER LOCALIZATION	WORLD	80% CHINA 20% WORLD	WORLD	WORLD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Thank you

ENERGYDOME

Making the Energy Transition happen

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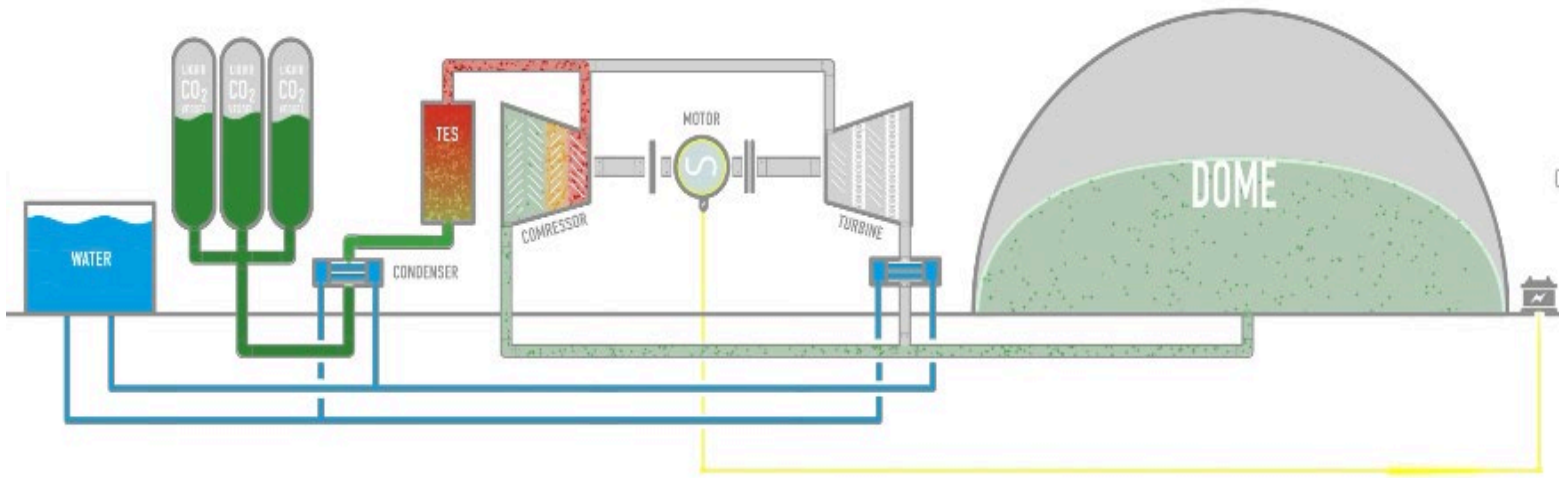
How it works



3 Main States

1 Charging

- CO2 withdrawn from atmospheric gasholder (Dome), and compressed by inter-refrigerated compressor
- Heat generated from compression stored into Thermal Energy Storage System (TES)
- CO2 is condensed into liquid state

2 Idle

- Liquid CO2 stored at ambient temperature in CO2 vessels

3 Discharging

- Liquid CO2 is evaporated and heated by recovering heat from TES
- Reheated CO2 expands in turbine, returning power to the grid
- Gaseous CO2 is stored in Dome at ambient temperature and pressure without emissions to atmosphere