

Marguerite Lake Compressed Air Energy Storage Project

# Marguerite Lake CAES

+48 Hrs







# 640 MW (2 Phases)





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### Grid Interconnection

 Site adjacent to ATCO Electric's Marguerite Lake substation which is connected to double circuit 240 kV transmission lines

## **Natural Gas Connection**

 Near existing natural gas infrastructure, requiring a 14.5 kilometer connection utilizing existing cleared and abandoned right of ways

### Subsurface

 Subsurface salt formations are ideal for solution mining and the storage of compressed air and natural gas and/or hydrogen

## Surface

Land is logged and clear cut; a Miscellaneous Lease disposition has been obtained from the Province

pwc







RESPEC









# **CAES Projects: Evolving Efficiency, Flexibility and Scale**

Projects	Huntorf	McIntosh	Marguerite Lake	A-CAES
Year	1978	1991	Development	Development
Power (MW)	320	110	2 x 320	~500
Duration (hrs)	~3	26	+48 hrs	~8
	Natural Gas	Natural Gas	Natural Gas / H2	Heat Storage





"Diabatic CAES offers the lowest installed cost for energy storage systems at durations ≥ 4 hours."

\*PNNL, 2022 Grid Energy Storage Technology Cost and Performance Assessment (100MW & 1000MW @ 4hr, 10hr, 24hr, 100hr)

## Emissions Reductions + Net-Zero Future with Hydrogen





GHG Reductions on Natural Gas Avoids ~8 million tonnes of CO<sub>2</sub> by 2050 - Cuts reliance on gas peaker plants and accelerates CtG retirements.

## Hydrogen Production

**60 tonnes/day** with 99% carbon capture using BrightLoop<sup>™</sup>. Aligned with Pathways Alliance carbon network timeline.

## Hydrogen Storage

Additional on-site salt caverns offer long-duration storage and hydrogen integration. MIMSRL approval from Alberta Energy.

# Thank You!

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## **Compressed Air Energy Storage Process**



Diabatic compressed air energy storage is a simple energy storage solution that relies on conventional air-compression and gas turbine technology for generation and dispatch, as well as underground salt caverns for the safe and reliable storage of compressed air.

#### **Typical Gas Turbine** = 1 process

Air compression consumes a significant portion of total power generated by a simplecycle gas turbine requiring more fuel

#### **CAES** = 3 processes

**Compression and expansion trains are decoupled into 2 separate** and independent trains, with cavern storage add in between.

energy storage
same technology
same reliability
higher efficiency
lower heat rate
less emissions
lower O&M costs
greater response
H2 capability

