

COMPRESSED AIR ENERGY STORAGE PROJECT Marguerite Lake (La Corey), Alberta

Federation Engineering is developing a 320 MW Compressed Air Energy Storage (CAES) project near La Corey, Alberta, adjacent to the Marguerite Lake substation. The project has made significant progress in the regulatory process and has been supported by extensive technical and environmental studies, with a Commercial Operations Date anticipated for Q4 2026.

The location grants the project access to the existing underutilized 240 kV double-circuit infrastructure and the Alberta Interconnected Electric System (AIES). Marguerite Lake CAES will facilitate the development of intermittent renewable energy in Alberta, providing reliability, grid stability, and ancillary services while reducing fuel consumption and greenhouse gas emissions. CAES brings many advantages; relatively low cost, long lifespan (over 30 years), low environmental burden (air is non-toxic and non-flammable), and scalability.

The first phase of the Marguerite Lake CAES project involves constructing a single 125 MW compressor train and two 160 MW expander trains. These trains will utilize compressed air stored in solution-mined salt caverns designed to hold 48 hours of full-load output.

The caverns will be in the 200-meter-thick Lotsberg halite of the Elk Point Group, approximately 1100 meters below the surface.

The compressor trains will be equipped with variable frequency drives for motor starting, a 30% turn-down, a 30% ramp rate per minute, and full load within 4 minutes. Each expander train will have a power production capacity ranging from 16 MW to 160 MW, with a ramp rate of 20% per minute and the ability to reach full generation within 10 minutes.

Additionally, the expansion trains have the potential to co-fire with hydrogen at a rate of 75%, with plans for future expansion to 100%.

Beyond the CAES project and on the pathway to net zero emissions, Federation is exploring opportunities for blue hydrogen generation by partnering with a leading technology provider. H₂ storage will be done in salt caverns within the Prairie Evaporite.

Close access to the Pathways Alliance Carbon Capture and Storage network will provide an efficient, cost-effective solution that captures over 99% of emissions.

