Turning Point Generation

April 2016

Canyon Creek Pumped Hydro Energy Storage Project

Thank you for your interest in the Canyon Creek Pumped Hydro Energy Storage Project. This document introduces the project, explains its purpose and discusses the next steps involved.

PURPOSE

The purpose of this Pumped Hydro Energy Storage (PHES) project is to store renewable energy on the electrical grid from the time it is generated until the time it is needed. This will enable more renewable energy to be integrated into the Alberta system while ensuring a reliable and stable supply of power when it is needed.

HOW IT WORKS

The project will create two small off-stream water reservoirs – one atop a hill and one at the bottom. These two lakes will be connected by a pipeline with pumps, turbines and generating equipment near the bottom reservoir in a powerhouse.

When there is a surplus of electrical power on the electric system, water will be pumped from the lower reservoir to the upper reservoir.

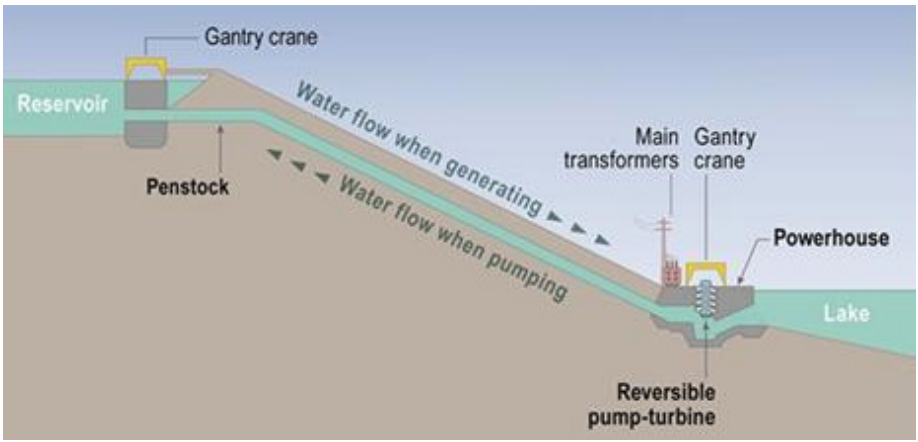
When the demand for power is high, water will be released from the upper reservoir down through the pipeline and generate electricity that will be put back on the Alberta grid.

In effect, the electrical energy is stored from the time it is in surplus supply on the grid until the time it is needed.

Location, Location, Location …

BENEFITS OF PHES

- Enable more renewable power in Alberta
- Stabilize grid and power prices
- Provides clean, reliable power when needed.
- About 300 construction jobs
- 80% of project funds stay in Alberta
- 5 - 7 full time jobs during operations
- Contribute to local tax base
- Closed loop system, no effluents and minor water intake requirements



THE TECHNOLOGY OF PUMPED HYDRO

Storing energy by Pumped Hydro is not new but it is innovative. There are over 300 such projects in operation around the world including one (1) in Canada. Our design uses a closed loop system to continually re-use the same water, a much smaller "footprint" than conventional hydropower. Much of the mechanical and electrical equipment is similar in design to conventional hydro power plants.

RESERVOIRS

The upper reservoir will be located just southeast of the Obed Mountain Coal Mine boundary. It will be created by expanding an existing lake and building a berm up to 14 metres (m) high. It will cover about 10 hectares (25 acres), and hold about 700,000m^3 of water when full. A small intake house approximately 20m x 20m adjacent to the berm will house safety shut-off gates and supporting equipment. The off-stream lower reservoir will be man-made, located on a lowland plateau beside the Athabasca River. It will cover about 10 hectares. Once constructed it will be filled with fresh water and each year a small amount of make-up water will be needed. We plan for water to be supplied by groundwater under the influence of the Athabasca River. This design ensures minimal impact on fish or the Athabasca River itself.

PENSTOCK

The penstock is a water pipeline that will be connecting the Upper and Lower reservoirs. We plan to use buried steel pipe about 2.5m in diameter and approximately 7km in length.

POWERHOUSE

The power house will be located in the vicinity of the lower reservoir and will house the pumping and generating equipment, control valves and all associated technology.

NEXT STEPS

TPG is commencing environmental studies and refining the design of the project. We expect the project to be shovel ready mid-2017. Construction is estimated to start late 2017 and should be complete by the end of 2019. The project design life will be 30 years, but likely to be in operation indefinitely.

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KEY PLAYERS

Community, Albertans and First Nations

Turning Point Generation (TPG) is conducting public consultation to inform the public about the project and receive comments from stakeholders. This is primarily focused on the local community, look for news releases in your local paper or on our website.

TPG has started the consultation process with the First Nations identified by the Aboriginal Consultation Office and will work closely with the First Nations to identify and minimize impact to their traditional lands and cultural heritage.

Alberta Utilities Commission

The Alberta Utilities Commission (AUC) ensures fair and responsible delivery of Alberta's utility services. TPG will be filing a power plant application with the AUC and AUC will review it in a public process.

Alberta Electric System Operator

The Alberta Electric System Operator (AESO) is an independent not-for-profit organization responsible for the safe, reliable and economic planning and operation of the provincial transmission grid. TPG has filed an application with the AESO for interconnection of the Canyon Creek PHES Project. AESO will study technical aspects of the interconnection and together with AltaLink will submit an application for need for interconnection to the AUC.

AltaLink

AltaLink is the Transmission Facility Owner in the area and will be responsible for routing and design of the interconnecting powerlines.