Turning Point Generation

February 2017

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, location and function, and discusses the next steps and timeline 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

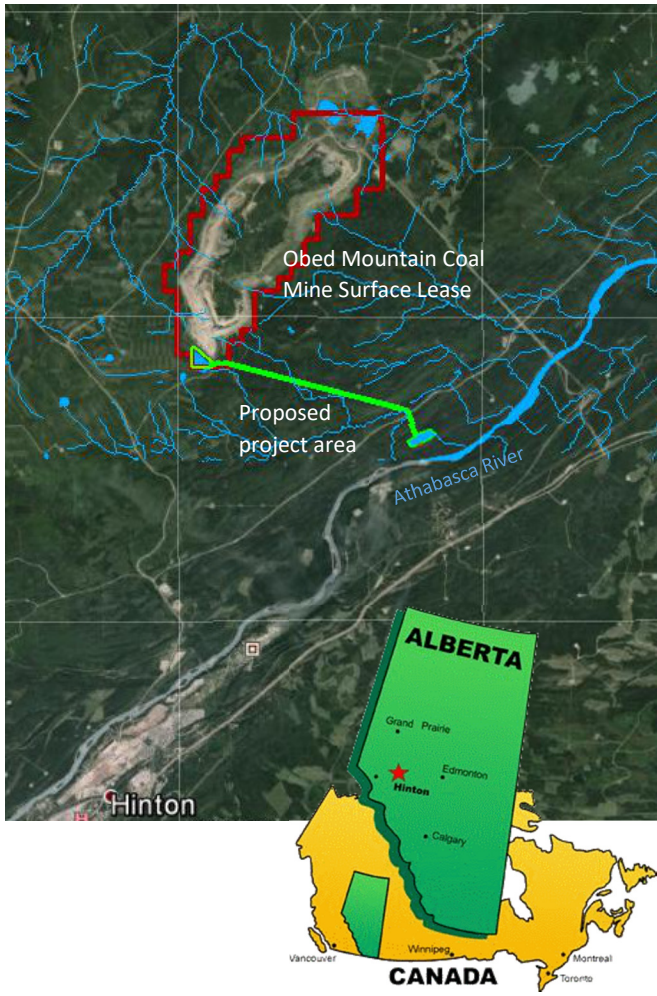
The project will create two small off-stream water reservoirs – one atop a hill and one at the bottom. These two lakes will be connected by a pipeline with pumps, turbines and generating equipment near the bottom reservoir in a powerhouse.

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.

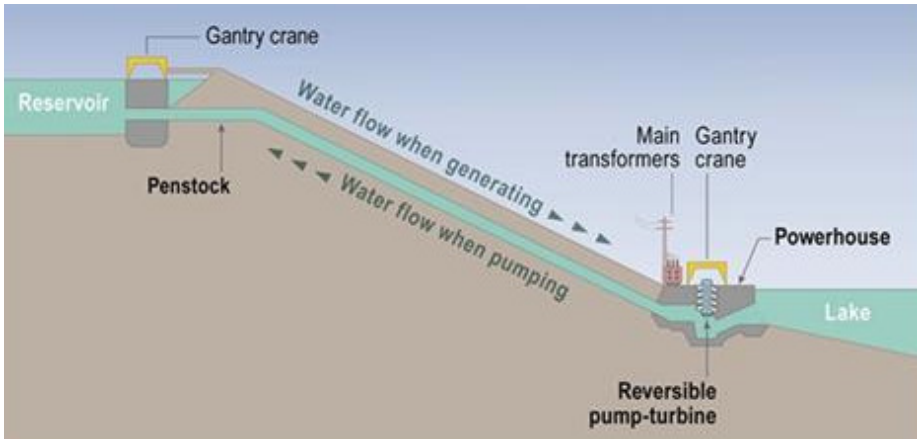
In effect, the electrical energy is stored from the time it is in surplus supply on the grid until the time it is needed.

Location



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.

RESERVOIRS

The upper reservoir is planned to be located in the southeast corner of the Obed Mountain Coal Mine surface lease. It will be created by utilizing the existing topography and building a berm less than 15m in height to impound water. It will cover up to 40 hectares (99 acres), and hold up to 2,750,000m^3 of water when full. A small intake structure approximately 20m x 20m adjacent to the berm will house safety shut-off gates and supporting equipment. The off-stream man-made lower reservoir will be located on a lowland plateau near the Athabasca River. We decided to locate the lower reservoir some distance away from the Athabasca River to minimize impact to local bio diversity zone. It will cover up to 45 hectares (111 acres). The project will require a fill of fresh water, we are still studying various options for the source of such. Once constructed it will be filled and each year a small amount of make-up water will be needed (the source is yet to be confirmed)

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. The routing of the penstock was designed so as to minimize creek crossings and impact on fish habitat. Only one small creek crossing will be required by the project.

POWERHOUSE

The power house will be located in the vicinity of the lower reservoir and will house the pumping and generating equipment and all associated technology. Domestic water well will be located near the powerhouse. The project will have capacity to store 75MW for about 37 hrs of full capacity generation.

NEXT STEPS

TPG commenced environmental studies and electrical interconnection work. We expect the project to be shovel ready in late 2017. Construction could start as early as 2018 and should be complete by the end of 2019. The project design life will be 30 years, but likely to be in operation indefinitely.

KEY PLAYERS

First Nations, Community and Albertans

Turning Point Generation (TPG) is starting 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 potential adverse impacts to Treaty rights or traditional uses.

TPG will be 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.

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. The project is now in Stage 2 of the AESO's interconnection application process.

AltaLink

AltaLink is the Transmission Facility Owner in the area and will be responsible for routing, design and construction of the interconnecting powerlines. AltaLink will be conducting their own First Nations and public consultations.

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