

# Tsageri Hydro Power Plant

## Tskhenistskali River



The proposed project involves the construction of a 110 Megawatt (MW) run-of-river Hydro Power Plant (HPP) on the Tskhenistskali River, in the Tsageri District of western Georgia's Racha-Lechkhumi Kvemo Svaneti region.

The HPP will be the downstream plant in a two-HPP cascade (Lentekhi and Tsageri HPPs) on the Tskhenistskali River. The site offers seasonally variable mean annual generation of as much as 570 GWh. The potential development of upstream storage reservoirs would improve annual energy production and reduce the seasonal variability of output. The Tskhenistskali is characterized by high flows in spring and summer, with maximum flow in June and minimum water levels in winter. The high flow begins in May and continues till the middle of July.

Access to the site is excellent. Both the powerhouse and diversion dam are adjacent to good roads. About 15 km of 220 kV transmission line will be constructed to connect the plant to the Lajanuri substation near Alpana.

The Tsageri development is expected to include a relatively low, concrete diversion dam, a 11,800-m-long, 5.2-m-diameter pressure tunnel, an excavated surge shaft, a short penstock, and a surface powerhouse. Intermediate construction adits can be used to shorten the tunnel construction schedule. The hydroelectric units for this high-head development will consist of two Pelton turbines and synchronous generators. The power plant may work in island mode as well as in synchronization with the national power grid, allowing both direct and grid-connected supplies to consumers.

According to preliminary assessments the plant offers a good opportunity to sell energy during winter inside Georgia, supplementing expensive thermal power, and export part of the energy during the summer to take advantage of the seasonal differentials in power prices between Georgia and its neighboring countries.

## Project Summary

Location: Kvemo Svaneti, Western Georgia  
River: Tskhenistskali  
Maximum Gross Head: 167 meters  
Rated Flow: 90 m<sup>3</sup>/sec  
Number and Type of Units: 2, Francis  
Construction Time: 3.5 years  
Potential Installed Capacity: 110 MW  
Mean Annual Power Output: 570 GWh  
Anticipated Life-span: 50 years



Project Location Map

## **Project Area Social and Environmental Characteristics**

**Location:** Northern Georgia, Racha-Lechkhumi and Kvemo Svaneti Region

**Administrative District:** Tsageri

**Area:** 756 km<sup>2</sup>

**Population:** 16,515

**Population density:** 22 people/km<sup>2</sup>

**Administrative center:** Tsageri

The Tskhenistskali River is 176 km long and drains an area of 2,120 km<sup>2</sup>. It rises in the glaciers of the Greater Caucasus. Its upper course flows through a deep canyon with many rapids and waterfalls; the lower course crosses the Colchis lowlands. The river is fed by mixed sources, with rain predominating. The mean flow rate near the mouth on the Rioni River is 60.2 m<sup>3</sup>/s; the maximum is 371 m<sup>3</sup>/s; minimum – 11,4 m<sup>3</sup>/s.

Its flow regime is characterized by high flows in spring and summer seasons, autumn high waters and relatively stable winter low flow. About 70% of the annual discharge occurs in spring and summer, 20% in autumn and 10% in winter.

Tsageri is the administrative center of the district. The population is about 16,515 people, mostly Georgians. The distance from Tbilisi to administrative center of Tsageri is about 273 km.

The total area of district land equals 756 km<sup>2</sup>. The largest part of Tsageri district is a mountainous area and the economy heavily relies on agriculture. The main economic activities of the region are potato growing and animal husbandry. Vineyards are also cultivated in some areas, especially in the lowlands of Tsageri.

Infrastructure of the region is developed: there are highways and high voltage transmission lines at 35 and 110 kV. Tsageri and Lentekhi towns of the Racha-Lechkhumi and Kvemo Svaneti region will be soon connected by a rehabilitated road. Locals will also have stable water supply following completion of an ongoing project. Rehabilitation of water and sewage systems is ongoing. The project is being implemented by Georgia's Ministry of Regional Development and Infrastructure and Municipal Development Fund.

The area is rich in old churches, monasteries and other cultural relics.

The landscape of the region is dominated by mountains that are separated by deep gorges. The average inclination of slopes is about 35<sup>0</sup>-45<sup>0</sup>. Forests occupy considerable areas of the territory. Mountain slopes are covered by mixed and coniferous forests, with mountain meadows, rocky peaks, and glaciers above the tree line.

The region is rich in minerals (arsenic, lead, zinc, granite etc) and mineral waters.

**Racha-Lechkhumi – Kvemo Svaneti Planned Protected Areas** are located on the southern slope of main watershed of the Caucasus range, in Lentekhi, Tsageri, Ambrolauri and Oni districts at 500-4600 m above sea level.