

Grid stabilization yerevan

AM, Syunik Province, Goris

The Vorotan Cascade, or the ContourGlobal Hydro Cascade, is a cascade on the Vorotan River in Syunik Province, Armenia. It was built to produce hydroelectric power and provide irrigation water. The Vorotan Cascade consists of three hydroelectric power plants and five reservoirs with a combined installed capacity of 404.2 MW. It is one of the main power generation complexes in Armenia.

After Armenia gained independence, the Vorotan Cascade belonged to the state-owned energy company Armenergo. In 1997, the Vorotan cascade was separated from Armenergo into a separate state owned company.

In 2015, ContourGlobal purchased the Vorotan Cascade operating company for US\$180 million. ContourGlobal has started a six-year refurbishment program to modernize the plants and improve their operational performance, as well as safety, reliability, and efficiency, with the total investment of \$70 million. This is the biggest investment US investment in Armenia. The International Finance Corporation, a member of the World Bank Group, did 20% of the total investment.

The Vorotan River has length of 178 kilometres (111 mi), the fall of 1,223 metres (4,012 ft), and the natural annual flow of 18.6 cubic metres per second (660 cu ft/s) for the link of Tatev. The source of the river is on 3,045 metres (9,990 ft) of the height and starts like a stream, accepting numerous ponds and streams.

The Vorotan Cascade is one of the main power generation complexes in Armenia. It provides both peak and base load power. It is used also for the grid stabilization. The Tatev HPP has installed capacity of 157.2 MW, the Shamb HPP has installed capacity of 171 MW, and the Spandaryan HPP has installed capacity of 76 MW. Total installed capacity of Vorotan Cascade is 404.2 MW and it generates 1.16 GWh of electricity annually.

The water stores of the Vorotan Complex are also used for irrigation in nearby village and town areas.

The Tatev HPP is located near the Vorotan village on the left bank of the Vorotan River at the altitude of 730 metres (2,400 ft). It is one of Armenia's largest hydroelectric power plants, with installed capacity of 157.2 megawatts (210,800 hp) and annual generation of 670 GWh. Power is generated by three Pelton turbines of 52.4 megawatts

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(70,300 hp) each.[11] The plant is unique has it is the highest-head hydroelectric power plant in the territory of the former Soviet Union and by using Pelton turbines.[8]

The plant includes the Tatev Dam which is a 41-metre (135 ft) high and 107-metre (351 ft) embankment type dam of sandy gravel. It includes also the daily regulation reservoir.[7] The dam creates the Tatev Reservoir.[8]

The Shamb HPP is located near the village of Shamb on the right bank of the Vorotan River at the altitude of 1,328 metres (4,357 ft).[10] It is one of the largest hydroelectric power plant having an installed capacity of 171 megawatts (229,000 hp) and annual generation of 320 GWh.[8]

The Spandaryan HPP is located near Shaghat at the altitude of 1,694 metres (5,558 ft).[10] It is the upper hydroelectric power plant on the cascade commissioned in 1989. The plant has an installed capacity of 76 MW and a projected annual electricity generation of 210 GWh.[8]

The Spandaryan Dam creates the cascade's upper reservoir, the Spandaryan Reservoir. The 83-metre (272 ft) high and 315-metre (1,033 ft) long Spandaryan dam is an embankment type, mixed rockfill and earthfill with clayey soiled bottom.[7]

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