

# SUCCESSFUL STRUCTURES FOR GEORGIAN HYDRO

GEORGIA IS ACTIVELY PROMOTING THE DEVELOPMENT OF ITS VAST HYDROPOWER CAPACITY IN ORDER TO IMPROVE ITS ENERGY SECURITY, REDUCE HYDROCARBON IMPORTS AND DRIVE FORWARD ITS ECONOMY. WITH ITS SMALL DOMESTIC ENERGY MARKET, LARGE-SCALE INVESTMENTS IN THE GEORGIAN ENERGY SECTOR ARE ONLY VIABLE BEYOND ITS BORDERS. BY **NANDITA PARSHAD**, DIRECTOR, POWER AND ENERGY UTILITIES AND **DAVID MANAGADZE**, PRINCIPAL BANKER, **EBRD**.

Among its neighbours – Armenia, Azerbaijan, Russia and Turkey – it is the latter market that is most commercially attractive given its size, economic growth and robust demand for power. Georgian power exports are especially profitable in the spring and summer months, when Georgia has excess hydropower capacity and when Turkish demand and prices are at their highest.

Trade between Turkey, interconnected with the Western European electricity network and the Caucasus network, still connected to the former Soviet system, was non-existent until 2014. What was missing was infrastructure.

In 2009, however, the government of Georgia embarked on a project to build the Black Sea Transmission Line (BSTL) with a high-voltage direct current (HVDC) back-to-back substation allowing electricity trade between two different systems, Georgia's and Turkey's. At the time, it was the largest infrastructure project in Georgia.

In addition to the government's funds, the project was co-financed by loans from the EBRD, the European Investment Bank (EIB), KfW (the German development bank) and a grant from the European Union's Neighbourhood Investment Facility, (NIF). The line became fully operational in 2014.

Thanks to the opening of the Turkish market with its high wholesale prices, coupled with the wealth of Georgia's hydropower resources, a large

and diverse number of private-sector investors started building new hydropower energy generators in Georgia. Many are co-financed by the EBRD, the leading renewable energy investor in the region. The most recent to reach financial close has been the Shuakhevi HPP, the largest hydro project to be constructed in Georgia in the last 30 years.

## The Shuakhevi project

The Shuakhevi HPP project is located on the Adjaristsqali river in south-western Georgia near the town of Shuakhevi, around 60km from the city of Batumi. The Shuakhevi HPP will have an installed capacity of 187MW with expected electricity output of 483GWh. The design envisages it as a run-of-the-river plant, with capacity of diurnal storage in two reservoirs (1.4m m<sup>3</sup>), allowing Shuakhevi HPP to store water for up to 12 hours and sell electricity at peak demand times. Construction comprises four tunnels with combined length of 37km.

The total investment in the project is US\$417m with a funded debt:equity ratio of 60:40. The plant will sell electricity to the Georgian grid during the three winter months (December, January and February) and to the Turkish grid during the other nine months for the first 10 years of operation, and solely to Turkey afterwards.



In Turkey, Shuakhevi HPP will operate as a merchant plant and sell electricity to an offtaker eligible to sell on the balancing market where electricity prices are among the highest in Europe. Financial close was reached in March 2015 and the project is scheduled to be operational in November 2016.

The 187MW Shuakhevi project is one of the largest foreign direct investment projects in Georgia to-date. The project is the first in a series of run-of-river plants with a possible total installed capacity of 340MW to be developed as a cascade on the Adjaristsqali River and its tributaries in the southern region of Adjara.

#### Contractual structure

Construction of the Shuakhevi project, which will comprise the 178MW Shuakhevi and 9MW Skhalta plants, began in October 2013 and is scheduled to be completed by October 2016. The development rights for Shuakhevi, and two other plants, are held by a consortium comprising Norway's Clean Energy Invest (40%); Tata Power, India's largest integrated power company listed on the Mumbai and New York stock exchanges (40%); and IFC InfraVentures (20%), through special purpose vehicle (SPV) Adjaristsqali Georgia (AGL). The project is being financed with senior loans from the EBRD, the IFC and the Asian Development Bank.

AGE Construction & Trading Inc (AGE), registered in Turkey, was awarded the civil works contract. AGE is well known in Turkey, where it has acted as a contractor on a number of hydropower and tunnelling projects with such large sector players as Enerjisa (Kavsak Bendi HPP).

A consortium led by Alstom with Turkey's GES Genel Elektrik was awarded a contract in March 2014 to equip the Shuakhevi plant. Alstom's contract includes the supply and installation of two vertical Francis turbines of 89MW (each operating at a speed of 600rpm at the rated head of 396.2m), governors, spherical-type main inlet valves, two three-phase vertical shaft generators, two three-phase generator step-up transformers, and a switchyard, with

complete mechanical and electrical balance-of-plant equipment.

In order to be able to sell electricity from Georgia to Turkey the project entered into an export transmission and dispatch agreement that allowed long-term capacity reservation on the export infrastructure. The agreement includes a take-or-pay arrangement for transmission access depending on the export capacity agreed.

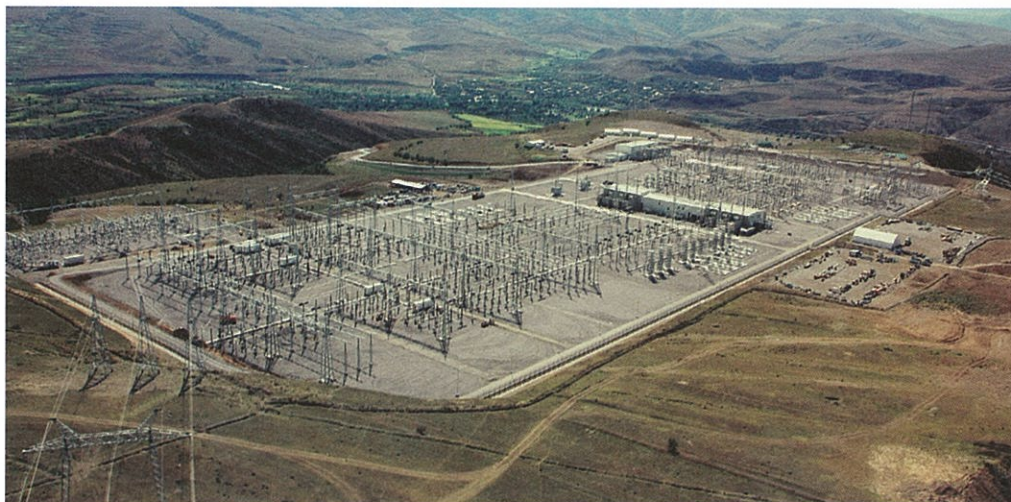
Grid connection to the Georgian network is secured with GSE, the state-owned company operating the electricity transmission network in Georgia. Construction and commissioning of the 220kV transmission line connecting the project to the Georgian grid will be undertaken by GSE. The expected deadline for construction of the transmission line is October 2016. The project will benefit from compensation should delays on the line materialise.

#### Project financing structure

The funded debt equity ratio is a conservative 60:40 due to the limited senior debt financing sources available and minimum debt service cover ratio (DSCR) requirements in the lender's base case. The door-to-door tenor of the senior loans from the EBRD, ADB and IFC is 17 years, with a sculpted repayment profile. The due diligence process was extremely thorough, and the deep experience of the EBRD in the power sector in both Georgia and Turkey was key to building consensus around a satisfactory and credible lender's base case.

#### Mitigating cross-border risks

The bank started supporting new renewable projects well before seeing any private-sector interest in the development of generation projects in Georgia. The EBRD provided support to the Ministry of Energy of Georgia and the regulator to set out clear and transparent rules of operation of the interconnector that will give priority access to renewable energy producers and define clear auction rules in the event of line congestion. Another challenge was co-ordination between Georgian and Turkish authorities on operation of the BSTL.



The operation of the 700MW BSTL is governed by several documents, including (i) an international agreement between Georgia and Turkey and (ii) an interconnection agreement between the Georgian and Turkish transmission companies.

The international agreement between Georgia and Turkey signed in 2012 outlines high-level objectives, operations and allocation of the BSTL. In the agreement, the objectives of increasing economic co-operation and electricity trade between Georgia and Turkey, allowing the full utilisation of the line, and giving priority to new renewable power generators, are clearly described. It also allows for the possibility of capacity reservations on the BSTL that EU rules allow for new transmission interconnectors.

The interconnection agreement was signed in September 2013 and builds on the international agreement mentioned above. In particular, it reiterates the rights of parties with transmission rights reservations and makes clear that the exporting country has responsibility for allocating capacity on the BSTL. The operating capacity, direction of power trade, and allocation of capacity are announced annually, although the agreement makes clear that for Georgian exports to Turkey, capacity rights to Turkey may last longer than one year.

#### Mitigating merchant risks

Agreeing to a topline is the most challenging due diligence task in a merchant project. AF-Mercados EMI acted as a lenders' market adviser and did a comprehensive market study based on a well-developed market model based on supply-demand analysis to forecast electricity prices over the life of the loan. Each technical, market and economic input was the subject of long discussions.

Despite the fact that the sponsors believe a standard project finance structure will be sufficient to make the project bankable, additional support has been built in, in order to mitigate further the potential merchant risks for the lenders.

First, the debt service reserve account (DSCR) requirement was set at a conservatively high 1.4x; second, the sponsors provided debt service deficiency support for the first years of operations to be released subject to satisfying certain financial tests; third: the DSRA was set at 12 months after release of the debt service deficiency support. Overall, the project proved to have a solid and sustainable structure to face all risks.

Until last year and the completion of the Black Sea transmission project, Georgia had minimal opportunity to export its excess summer hydropower output to markets with either an energy deficit or higher power prices. However, the commissioning of the BSTL project has provided investors with a strong investment case for their hydropower projects, predicated on sales to Turkey, where demand growth is outstripping supply and pushing prices higher.

#### Other projects

Georgia's first privately developed and financed large-scale hydropower plant entered commercial operation in October 2014. The 85MW Paravani run-of-river plant is the first significant greenfield hydropower project to be built in Georgia since the country secured its independence in 1991.

The project sponsor was Anadolu Group, one of the largest Turkish conglomerates with a business focus in the following principal segments: beverages, automotive, retail, financial services and energy. The EBRD provided a loan of US\$63.5m and equity of US\$5m. Further financing of US\$52m was provided by the IFC. Both EBRD and IFC loans are syndicated to Industrial Development Bank of Turkey, TSKB.

The construction of the Dariali HPP, 108MW run-of-river project on the river Tergi in north-eastern Georgia, is under way. The project, expected to produce 510GWh annually, is one of a number of projects involving domestic investors with the support of state-owned fund.

The project company, JSC Dariali Energy, is a majority privately owned joint venture between two private local companies, Peri Ltd and Energy LLC, The Robbins Company, a US-based manufacturer of underground construction machinery, and the Georgian Energy Development Fund (GEDF), a fund established in 2010 by the government to facilitate investment in and development of renewable energy, through early project development before transfer to private investors.

The EBRD arranged a US\$80m syndicated loan to Dariali Energy for the development, construction and operation of the US\$123m project – the first limited-recourse hydropower project in Georgia financed under an A/B long-term syndication structure. The EBRD provided an A loan of US\$40m while the B tranche is split into a US\$30m tranche from Dutch development bank FMO and a US\$10m tranche from the Green for Growth Fund, a specialised fund launched by the EIB and German development bank KfW, with the financial support of the European Commission and the EBRD.

In addition the EBRD has financed a number of smaller projects: four totalling 20MW for a total EBRD financing of US\$8m.

To-date, the Black Sea Transmission Line has attracted more than US\$750m in committed foreign direct investment in the Georgian energy generation sector, all of it private. Investors have come from all around world, including from the US, Turkey, India, Norway and South Korea.

The Caucasus state will, however, not have to wait as long for further new hydro capacity. A raft of projects are planned by domestic and foreign investors keen to harness the country's huge hydropower potential and take advantage of the opportunities afforded by the newly commissioned BSTL to export to power-hungry Turkey. ■