

Project:
Operation nr:

Luxembourg,
PJ/ / /

Corporate use



Luxembourg, 18 December 2019
Operation No.: 2008-0079

PROJECT COMPLETION REPORT

VARDNILI & ENGURI HYDRO REHABILITATION

GEORGIA

TABLE OF CONTENTS

Scope.....	2
Cost and Schedule	2
Performance.....	3
EIB Involvement	3
ESCS.....	3
Promoter's Optional Final Comment	3

Disclaimer:

The financing for this project benefits from an EU guarantee to the Bank under DECISION No 466/2014/EU of the European Parliament and of the Council. Pursuant to Article 9 (2) of this Decision, the Bank "shall require the project promoters to carry out thorough monitoring during project implementation until completion, inter alia, on the economic, development, social, environmental and human rights impact of the investment project. The EIB shall verify on a regular basis the information provided by the project promoters and make it publicly available if the project promoter agrees. Where possible, project completion reports related to EIB financing operations shall be published excluding confidential information."

The information and views presented in this document are the EIB's and do not necessarily reflect the views of the promoter and/or any other third party. Confidential information contained in this document has been removed in accordance with the EIB Group Transparency Policy.

Scope

Enghuresi Ltd, the promoter, started the phased rehabilitation of Enguri hydropower scheme in 2000 with the financial support from the European Union, the European Bank for Development and Reconstruction (EBRD) and the European Investment Bank (EIB). The hydropower scheme has been built in the 1970s. The Enguri Hydro Power scheme consists of the following assets:

- Enguri HPP is a 1,300 MW underground hydropower plant consisting of 5 x 260 MW Francis turbines. The Enguri and Eristskali rivers flow into the Enguri reservoir (1.1bn m³, 271.5 m arch dam) which, in turns feeds Enguri HPP through a 15 km long and 9.5 m diameter pressure tunnel. The Enguri switchyard has 500 kV and 220 kV distribution substations serving Georgia's grid and connecting it with the Russian grid.
- Vardnili 1 HPP is a 220 MW hydropower plant consisting of 3 x 73 MW Francis turbines. The plant is located at the toe of the Gali dam & reservoir (146 mln m³, 60 m gravity dam), which itself is fed mainly from the outflow of the tailrace tunnel of the Enguri HPP, located about 25 km upstream. The plant connects to 220 kV network.
- Vardnili 2, 3 & 4 HPPs are three identical 40 MW run-of-river hydropower plants consisting of 2 x 20 MW bulb turbines each. The plants have their own small dams and are located on a 23 km open water channel from Gali dam to the Black Sea. When operational, the units were connected to 110 kV network. They were fully destroyed during the civil war that ended in 1992

The Enguri dam is located in a territory controlled by the Georgian Government whereas the remaining components of the project are located in the Gali District of Abkhazian region of Georgia currently under Abkhazian and Russian control.

The project is the second stage of the restoration focusing on the 220MW power plant Vardnili 1 and 1,300MW Enguri plants. It aims i) at restoring the original generation capacity of the two plants and ii) at improving their safety and reliability. Enguri and Vardnili 1 power plants have suffered from lack of maintenance and faulty original installations since they have been commissioned. The project consists of the following components:

- (a) the rehabilitation of two generator units (1 and 5) at Enguri hydropower plant (units 2, 3 and 4 have been rehabilitated in previous stages), and
- (b) the investments for operational and safety improvements at the Vardnili 1 HPP. This includes
 - a. Cleaning, dredging and repair of Vardnili water channel and repair of the access roads until Vardnili 2 HPP.
 - b. Rehabilitation of spillway, bottom outlet, gates and trashracks at Gali dam and Vardnili 1 HPP
 - c. Gali dam monitoring instrumentation
 - d. Electrical and control system upgrade at Vardnili 1 HPP

Promoter name: Enghuresi Ltd

Link to Website: <https://www.engurhesi.ge>

Cost and Schedule

The final investment costs amounts at EUR 51.46M. The project costs increased by 9.5% from EUR 47M at appraisal due to sub-items that have been added in the detailed scope and agreed by the Independent Engineer Stucky in the course of the works. The overall scope remained unchanged. The price increase has been covered by an increase of EIB loan from EUR 20M up to 23.5M on 21 June 2017, and by Promoter's own funds.

The loan was signed on 28 December 2010. Additional studies required as conditions to disbursement were carried out in parallel of the tendering process in 2011. The bathymetric survey has subsequently been performed in 2012 and preparatory works including access roads were completed in October 2013. The works related to Vardnili 1 HPP rehabilitation took place from 2013 until September 2017. The works related to Enguri HPP were completed in 2015. The project suffered from 3-year implementation delay due to i) the additional studies required to address the construction risks and conclude on the detail scope of works, as well as ii) delay in the civil work procurement process. In 2013, a first civil work tender has been cancelled due to unsatisfactory results. It was relaunched and awarded to a consortium formed by Georgian and Ukrainian companies. The consortium implementation pace were later negatively affected by the Ukrainian crisis in 2013.

Performance

The Bank is satisfied that the project has performed according to expectations. The Project, once completed, resulted in an increase of reliability and performance. It translates into an increase of Enguri HPP (resp. Vardnili 1 HPP) generation figures from 3,314GWh (resp. 592) up to 4,019GWh (resp. 738) during 2015-2018. The total generation at rehabilitated sites increased by 852GWh, i.e. +22% by 2018. It addressed c. 40% of the Georgian consumption increase between 2015 and 2018. In turn, by providing additional green energy from existing assets to the national grid, the Project contributed to avoid around 852 tons per annum of CO2 emission.

The total price increase had a marginal negative impact on the economic and financial rates of return. The rehabilitation project remains profitable for the company and the country. With a 120MW capacity increase at Enguri HPP and increased reliability, the levelised cost of the project is estimated at c. 14 EUR/MWh.

Due to the scope of the works, the project has had no substantial environmental and social impacts. No issue has been reported to the Bank during the implementation phase. As part of the completion review, the Bank visited the sites in December 2019. The Promoter reported that Primorsk village located on the Black Sea near the outlet of the Vardnili water channel, has experienced some flooding events after the capacity of the water channel has been restored to its design value (450m³/s). EIB witnessed that the northward sea current carries significant sediments along the coastline, blocking the manmade Vardnili channel at the confluence. As a result, the channel water has found a new path towards the Black Sea after running 1.3km along the coastline to the South. While no property has been affected, the Promoter will adopt additional flood protection measures in the near future.

EIB Involvement

The Promoter has performed an environmental impact assessment study in 2008 prior to the works. Based on the study and its internal assessment, EIB determined a list of mitigation measures that have been successfully implemented by the Promoter. The project did not involve any resettlement and no households were located near the works.

An Independent Engineer Stucky has been hired by the Promoter with the proceeds of the loans to monitor the project. They reported on the detailed updated scope of rehabilitation as well as environmental and social action plan to the Bank's satisfaction. On 28 March 2018, the Independent Engineer issued a Completion Report that serves as a basis to the present document.

ESCS

The Environmental and Social Completion Sheet (ESCS) has been published separately.

Promoter's Optional Final Comment

Not applicable.