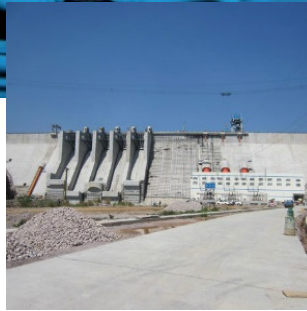


Bui Dam project, Ghana

I N T E R N A T I O N A L

28 May 2014 by [Simon Ann-Scott](#)

Located on the boundary between the Northern and Brong Ahafo Regions, Ghana's second largest hydroelectric generating station was commissioned by the country's President, John Dramani Mahama, in December 2013. Commissioning of the project means the country is one step closer in its goal of becoming a major power producer in West Africa.



The development of a hydropower scheme on the Black Volta River at the Bui Gorge had been the subject of many studies; including detailed studies by J.S. Zhuk Hydroprojekt of the USSR in 1966, a Feasibility Study by Snowy Mountains Eng. Corp (SMEC) of Australia in 1976 and another Feasibility Study by Coyne et Bellier in 1995, which was subsequently updated in October 2006 to enable commencement of the project.

The Bui Power Authority Act 2007 (Act 740) was enacted by the Parliament of Ghana and assented by the President in July 2007 to establish an Authority known as the Bui Power Authority (BPA) whose role it was to plan, execute and manage the 400MW project.

Bui Dam - project description

The Bui hydroelectric project consists of a roller compacted concrete (RCC) gravity dam across the Black Volta and two Saddle Dams on the right bank to contain the reservoir. The RCC dam has a five-bay spillway arranged in the middle and a powerhouse located at the toe on the left bank. The powerhouse has three generating units each with a capacity of 133.3MW. Power produced from the plant is evacuated from the newly constructed Bui Switchyard through 161kV transmission facilities operated as part of the National Interconnected Transmission System.

A total of 240km of transmission lines has been built under the project. These include two 18km and 17km lines which broke into the existing Sawla-Techiman lines to form Bui-Sawla and Bui-Techiman lines. Other transmission facilities constructed are the 67km Bui-Kintampo line, the 138km Bui-Sunyani line, and expansion of the Sunyani Substation to accommodate the new Bui-Sunyani line.

The Bui project is primarily designed for hydropower generation. It also includes the development of an irrigation scheme for agricultural development, and measures to enhance ecotourism and fisheries. It also included a Resettlement and Community Support Program.

The project has led to the resettlement of seven communities with a total population of 1216. The resettlement program has been divided into three parts. The first part (Part A) involved settlement of communities that were living within the project construction area. For this reason, the resettlement of these communities was undertaken prior to the commencement of construction activities. The second part (Part B) involves the resettlement of communities that resided at locations that were inundated when the impoundment began in 2011. The third and final part (Part C) involves the resettlement of the Bui Camp, the current residence of personnel of the Game and Wildlife Division of the Forestry Commission which have been assigned to protect the Bui National

Park.

The project also included the construction of a bridge across the Black Volta River downstream of the dam to facilitate the movement of personnel, agricultural produce and improve access to markets for the communities in the project area.

Implementation

The project was implemented under an Engineering, Procurement and Construction (EPC)/Turnkey Contract awarded to Sinohydro Corporation Limited of China. The works were supervised by Bui Power Authority (BPA) with the assistance of an Engineering Consultant; Tractebel Engineering/Coyne et Bellier.

The project implementation commenced with detailed geological and hydro geological investigations. These were carried out between October 2007 and March 2008.

Construction Phase I (Preparatory works) which included the erection of temporary facilities and support services required for the dam construction commenced in January 2008 and were completed in December 2008.

Construction Phase II (Main works) commenced in January 2009. Impoundment began 30 months after start of construction on 8 June 2011. The reservoir is designed to have a full supply level of 183m asl and an associated maximum surface area of 444km². It was expected that the reservoir, would require at least two rainy seasons after river impoundment to build up sufficient head for the commencement of power production. In the 2011 rainy season, the reservoir level rose from about 100m to about 132m. After the 2012 rainy season, the reservoir had as expected attained 169.7m asl which was sufficient to enable commissioning of the generating plant.

After dry and wet tests were successfully carried out, the three generating units were commissioned in May, July and November 2013 respectively. Other associated and non-power works on the project will be completed by mid 2014.

Completion of the project provides Ghana with an additional 400MW (20% increment) of installed capacity with average annual generation of 1000GWh.

Project benefits

Power supply

The 400MW plant will increase the country's generation capacity by about 20% and improve reliability and security of power supply to the Northern sector of the country.

The infrastructural additions to the National Interconnected Transmission System will also increase the capacity and quality of electricity service delivery in the Brong-Ahafo, Northern, Upper East and Upper West Regions of the Country.

Provision of Ancillary Services from the Bui Plant - i.e. Peaking Power and Reactive Power - will improve the voltage profile and power factor of the power system and in so doing also reduce transmission losses.

Agriculture

The potential development of about 30,000 ha of irrigable land could form the bedrock for massive mechanized farming to improve the production of food and cash crops. The Lake that has been formed also presents the potential for enhancing the fisheries resources of the Black Volta River and increasing the yield.

Socio-economic

The project has provided opportunities for employment both during project construction and thereafter, and offers improvement in

educational, health and social facilities and services to nearby communities is part of the project. A further benefit of the project is improved potable water supply for domestic use.

[Project profile by Carriann Stocks](#)

Photo: The 400MW Bui Dam project in Ghana. Photo: Wikimedia Commons, user wtshymanski



12 – 13 SEPTEMBER 2018
Pre-conference: 11 September | Site Visit: 14 September 2018
KICC, Nairobi, Kenya
www.future-energy-eastafrica.com



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