

Dumsor: Energy Crisis In Ghana

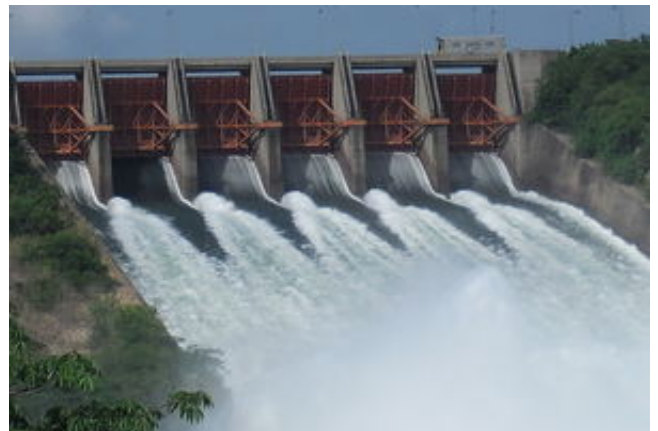
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April 29, 2018

Submitted as coursework for [PH241](#), Stanford University, Winter 2018

Introduction

Ghana was the first country in sub-saharan Africa to gain independence in 1957. The country's electricity sector goes back to the colonization era, when Ghana was the Gold Coast. In those times, isolated diesel generators - mostly owned by industrial organizations such as factories, mines, and institutions like hospitals and schools - were the main source of electricity supply.

Today, hydropower, generated by three dams, of which the Akosombo Dam is the largest, serves as Ghana's main source of energy. The Akosombo Dam (Fig. 1) was originally built in the 1920s to serve the British. It was revamped in the 1950s by Dr. Kwame Nkrumah, Ghana's first president, to serve the newly independent nation. [1] Since then, two more dams have been built to meet Ghana's growing energy needs. Ghana exports electricity



to the neighboring countries of Benin, Togo, Cote d'Ivoire and Burkina Faso. Despite generating enough electricity to afford exporting to other countries, Ghana is in an energy crisis, with unpredictable power supply to industries and homes. "Dumsor" refers to the problem of frequent power outages in Ghana.

Fig. 1: The Akosombo Dam. (Source: [Wikimedia Commons](#))

Delving Into the Issues

The electricity sector in Ghana has relied heavily on the Akosombo Dam. The dam is fed by the Volta River, the largest reservoir by surface area in the world, and the fourth largest by water volume. At its inauguration in 1983, the Akosombo Dam had a capacity of 1,030 MW. Ghana pledged to provide nationwide access to electricity as far back as 1989, when only 15%-20% of the population had access to electricity. The goal was to extend electricity to every part of the country by the year 2020. In 2018 however, 35 years after the dam's inauguration, it struggles to supply 67% of the nation's power needs.

"Dumsor", as the sudden power outages have been dubbed in Ghana, is not a new issue. The country has had periods of load shedding exercises in the past; in 1983, 1998, 2006/7, and as recently as the past year. In the last few years however, the situation has become dire. Electricity demand has seen an increase of about 52% over the course of the last decade (from 2006 to 2016). The installed generation capacity has almost doubled within the same period of time. [2] Despite this, Dumsor still occurs on an almost daily basis. The situation

can be ascribed to the fact that due to fuel supply challenges, the installed generation facilities are unable to function as they are intended to. In recent years, due to a drought that has lowered the water levels in the Volta River (which feeds the lake), and subsequently, the Volta Lake, the dam has seen a consistent drop in water levels below the acceptable operational levels. Thus, the Akosombo dam, and the two other dams, Kpong and Bui, have been operating at diminished capacities of 900, 140 and 342 MW instead of at their operating installed capacity of 1020, 160 and 400 MW, respectively. [3]

According to the World Bank, electricity poses the second most important constraint to business activities in Ghana. The World Bank estimates that the country lost about 1.8 percent of GDP during the 2007 power crisis. [4]

Looking Ahead

The increase in installed generation capacity from 1,730 MW in 2006 to 3,785 MW in 2016 coupled with the fact that peak electricity demand only increased by 50% shows that all hope is not lost. With a little more research and deployment of more advanced and efficient technology, Dumsor can become a thing of the past. [2]

Renewable energy provides Ghana with viable options to the power crises, because the country is endowed with numerous renewable energy resources particularly solar (4.5 - 5.6 kWh/m²/day of solar radiation). Developing these sources will greatly augment energy supply while reducing the dependence on traditional electricity generation methods. This will also reduce the burden on the electricity generation facilities. It will also counteract losses incurred in transmitting electricity over long distances from generation centres, most of which are found in the southern part of Ghana, to the consumption centres in the middle and northern parts of the country. In the long run, developing these resources could go a long way to positively impact the cost of electricity for all stakeholders.

Ghana's Renewable Energy Act, passed into a law in 2011, provides the legal framework for the introduction of renewable energy sources into the country's generation mix. The Renewable Energy fund provides financial resources to promote, develop, manage and utilize renewables, while providing financial incentives for the development of mini-grid and off-grid renewable power systems for remote areas and island communities. However, in order to attract investments into the renewable energy sector, it is imperative that the Ghanaian government strengthen efforts to enforce the act, while introducing more incentives to draw investors.

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