

Nigeria electricity distribution

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Fossil fuels: coal, oil, and natural gas have been the principal sources of energy in Nigeria. The trends in the total energy supply for coal from 1990 to 2018 are shown. By 1990, there was a steep decline until 2000. An increase in the use of coal is seen from 2000 till 2015 till about 2018 when it fell slightly (Figure 3). Coal was discovered in Nigeria in 1909 in Enugu, eastern Nigeria, with early production dating back to 1916. About 24,500 tonnes of coal was produced and used for mass (railway) transportation, which increased electricity generation, and industrial activities.

Total energy supply from Hydro on the other hand increased for over a decade (1990-2000), with sharp increase between 2000 and 2005, followed by falls till 2015 when TES from hydro increase from about 450 to 550 ktoe (Figure 6).

According to the Nigerian Electricity Regulation Commission (NERC), electricity generation started in Nigeria in 1896 but the first electric utility company, known as the Nigerian Electricity Supply Company, was established in 1929.

By 2001, the Independent Power Producers (IPPs) and National Integrated Power Projects (NIPP) were established to remedy the power shortage situation. In 2005, Nigeria had an estimated 6,861 MW of installed electricity generating capacity (Babatunde and Shauibu, 2011).

In 2010, the Nigerian Bulk Electricity Trading Plc (NBET) was established as a credible off-taker of electric power from generation companies. By November 2013, the privatization of all generations was complete. Also, By July 2014, the total installed capacity of generating plants increased to 8,876 MW but with an available capacity of about 3,795MW.

There are currently 23 grid-connected generating plants in operation in the Nigerian Electricity Supply Industry (NESI) with a total installed capacity of 11,165.4 MW and an available capacity of 7,139.6 MW. Most generation is thermal-based, with an installed capacity of 9,044 MW (81% of the total) and an available capacity of 6,079.6 MW (83% of the total). Hydropower from three major plants accounts for 1,938.4 MW of total installed capacity (and an available capacity of 1,060 MW).

Actual electricity supply has been significantly less than load demand, for instance in 2014 and 2016, the actual supply lagged behind the power demand by 21,639MW and 23,401MW respectively, representing about 15% and 17% of power availability. Thus, there is no corresponding increase in electricity generation as

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population increase as shown in 2014 where country's population increased to 165 million but the total available power generated stood at 3,795MW (Babatunde and Shauibu, 2011).

Currently, Nigeria is one of the most underpowered countries in the world, with actual consumption 80% below expectations based on current population and income levels. Self-generation in Nigeria is extremely prevalent; nearly 14GW capacity exists in small-scale diesel and petrol generators, and nearly half of all electricity consumed is self-generated implying a huge unserved demand. Given this, we can assume that Nigeria's demand gap is significant, though exactly how large is disputed. The significant differences in these estimates demonstrate the difficulty, and importance, of accurate demand forecasting (See table 3 below)

This makes a large segment of Nigerians rely on alternative sources of power using mostly fossil fuel (both centralized large-scale and small diesel generators) which contribute significantly to carbon footprints.

Currently, the transmission system is made up of about 5,523.8 km of 330 kV lines, 6,801.49 km of 132 kV lines, and 24,000km of sub-transmission lines (33kV) (KPMG, 2016). The power distribution network is presently made up of 19,000Km of 11kV lines and about 22,500 Substations. Currently, 11 electricity distribution companies are covering the entire country.

By 2013, the privatization of 10 distribution companies was completed with the Federal Government retaining the ownership of the transmission company. The privatization of the 11th distribution company was completed in November 2014. There are currently 11 Electricity Distribution Companies (DisCos) in Nigeria.

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