EmPower Nigeria

Improving Nigeria's electricity supply industry through public education

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Nextier Power is a consulting firm that provides policy advisory, investment advisory, and support services to the electricity supply industry. The firm aims to use this weekly publication to educate Nigerians on the intricacies of the Nigeria electricity supply industry on the assumption that a more informed public would advocate for the right policies and programmes which, in turn, would lead to a robust market that delivers the electricity needs of Nigerians. This column will cover everything from the basics of the industry to the more intricate, sometimes, complex policies and programmes.

Decoding Power Sector Lingo

When we listen to power sector analysts discuss the power situation in Nigeria it is clear that the sector has a unique language with industry specific terms. Without an understanding of these terms, most listeners find it difficult to navigate the maze of jargon or issues. This article provides the meaning of the oft-used terms in the electric power industry.

Power Sector Infrastructure

Electric power is produced in a generation company (**GenCo**) and sent to the distribution company (**DisCo**) that then supplies it customers. The **transmission grid**, which connects the GenCo and the DisCo, is an interconnected network of wires, equipment, and substations. In colloquial Nigerian parlance, the grid is known as *high-tension* wires.

In the past, the Federal Government of Nigeria (FGN) owned the GenCos and DisCos but, in 2013, they were **privatised** (or sold to private owners). The FGN retained ownership of the grid under the management of the **Transmission Company of Nigeria (TCN).**

For more details, see **EmPower Nigeria:** ***From Fuel to Power*** Vol. 1, Issue 2. (ThisDay July 12, 2017) or visit Nigeria Electricity Hub (www.goo.gl/49LjMn)

Prior to privatisation, electricity flowed from GenCos to TCN, to DisCos and then to customers, while money was expected to flow in the reverse direction. In most cases, the money did not flow back and this impacted the ability of the GenCos to produce more electricity.

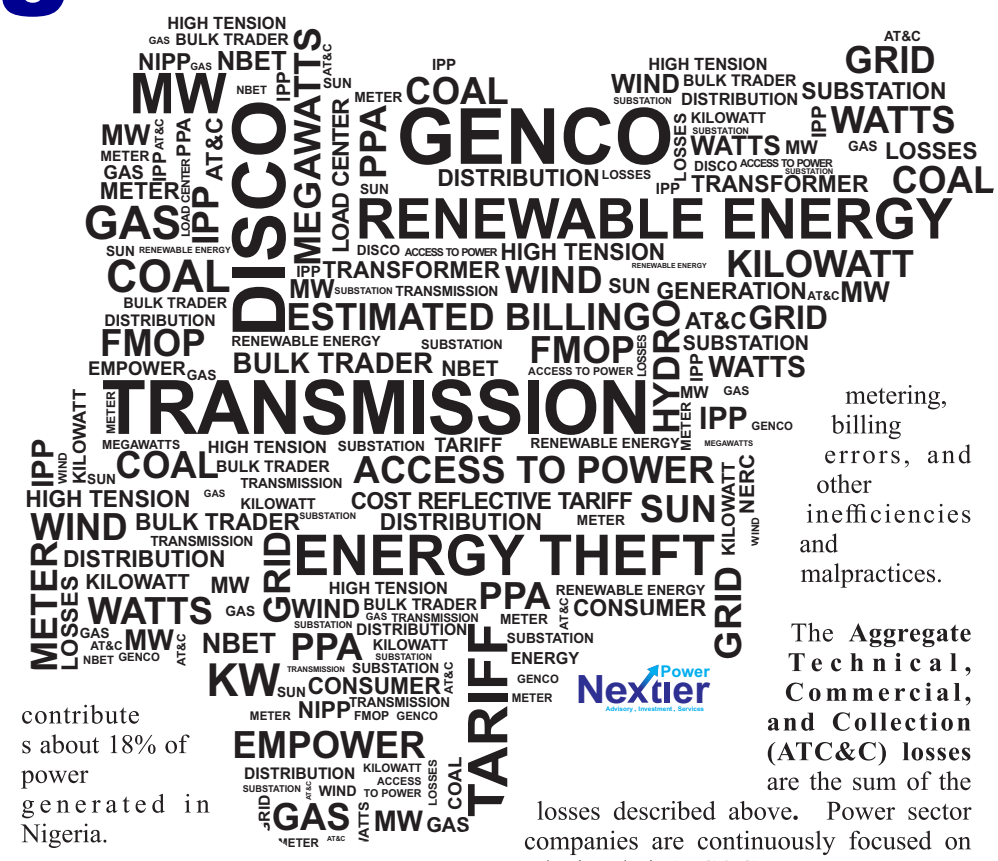
The FGN created the **Nigeria Bulk Electricity Trading Plc.** (**NBET** or **Bulk Trader**) to guarantee payment for power produced by the GenCos. NBET issues a **Power Purchase Agreement (PPA)** to GenCos pledging to pay for whatever power is generated up to the terms of the agreement. The PPA gives the GenCos more comfort because NBET has a **partial risk guarantee** of the World Bank. At its set up, NBET had $700 million to back up its position.

Generation Technologies in Nigeria

GenCos in Nigeria use three major technologies to produce electricity: thermal energy, hydroelectric energy, and renewable energy technologies.

Thermal energy technologies generate electric power through burning of fuels. **Gas-fired generation,** which burns gas to generate power, is the predominant technology in use in Nigeria. However, these plants release **carbon emissions** that pollute the atmosphere and deplete the ozone layer. Gas plants produce about 81% of power generation in Nigeria.

Hydroelectric generation, which produces electricity from fast-flowing water, produces cleaner energy. This



contributes about 18% of power generated in Nigeria.

Renewable energy generation in Nigeria is primarily from the sun, wind, and biomass. These are cleaner and more sustainable sources of power. This technology produces less than 1% of Nigeria's power generation but there is increasing focus on its potential, including from the government.

Measuring Power

Electricity is measured in **watts**, which is the base unit of power in the metric system. In this system, a **kilowatt (kW)** equates to 1,000 watts and a **megawatt (MW)** is 1,000 kW. A typical bulb can be 15w, 30w, 60w or more.

The amount of energy delivered by a system at any given time is known as the **load** or **demand**. **Peak Energy Demand** is that point when the demand for electricity is at its highest. Think of your favourite supermarket on a busy Saturday afternoon when every checkout point is staffed but the checkout lines are still unbearably long. Power plants are built to meet peak energy demand all year round, even on the busiest days of the year.

Understanding Losses

Generation plants are generally located at a distance from the **load centres** (cities, localities, villages, etc.) where the electricity is used. The electricity has to be transmitted through the grid over long distances and some of the electricity is lost, as heat, in the process. These **technical losses**, though inevitable can be managed with new equipment hence the need to upgrade both the transmission and distribution network.

The distribution companies also suffer **commercial losses** due to energy theft (see below). There are also **collection losses** resulting from failure or inability to collect bills because of non-payment of bills, poor metering, billing errors, and other inefficiencies and malpractices.

The **Aggregate Technical, Commercial, and Collection (ATC&C) losses** are the sum of the losses described above**.** Power sector companies are continuously focused on reducing their ATC&C Losses.

Billing

Discos are responsible for supplying electricity and collecting payment from customers for power used. The customers are required to pay the power **tariff**, which is the price for electricity consumed. In Nigeria, tariff varies across different customer classes including residential, commercial, industrial, special class (hospitals, schools, government) and streetlights.

DisCos have resorted to the practice of **estimated billing** because of their failure to provide electricity meters to their customers. This is a practice where the DisCo estimates how much energy the unmetered customers used. The estimation is based on consumption data for comparable customers by property size, type, use, etc.

Energy Theft

Energy theft is a situation where customers tamper with their electric meter and/or power distribution lines to avoid or reduce the true expense due for the energy consumed. Data shows that the rich as well as the poor are equally culpable.

Energy theft is punishable under the same laws that prohibit theft by whatever means. Such theft results in losses that increase the operating costs of the utilities, which, in turn, is shared amongst the paying customers. Therefore, it is in the interest of paying customers to report any suspicions of power theft.

Some indicators of energy theft include inverted meters, holes in the glass meter cover, magnets near the meter, jumper wires around the meter, intercepting electricity upstream of the meter or a constantly beeping meter for many days on end. There are also cases of "flying connections", where people connect wires directly to the distribution poles to "tap electricity" directly into their homes. All of these incidents should be reported to the local DisCo.

Proposed Future Tariff Model

There is a need to implement a **cost reflective tariff structure**, which is a power charge that accounts for the total cost of generation and supply of power to customers. Currently, customers pay a tariff that is much lower than the actual cost of producing and supplying the electricity. It is expected that a cost-reflective tariff would encourage a change in customer behaviour towards energy conservation, and this in turn, would lead to reduction in the size of their bills.

Nigeria's Liquidity Crisis Decoded

You may have heard experts talk about the power sector's **liquidity crisis**, a situation where funds do not flow back up the value chain for power supplied. Power generated is sold to NBET who then sells the electricity to DisCos. However, the various inefficiencies in the market have led to the inability of the DisCos to collect bills and pay for the electricity. Some of these inefficiencies include lack of cost-reflective tariff, energy theft, high ATC&C losses, etc. When DisCos do not pay for energy allocated to them, NBET, in turn, is unable to pay the GenCos. In this scenario, GenCos are not able to pay for the fuel required to generate electricity and a vicious cycle is set in motion.

The liquidity crisis threatens the viability of the Nigerian power sector. The Buhari administration is pursuing a $5.2 billion loan from the World Bank to stabilise the sector. The loan will be used to fund the **Power Sector Recovery Programme.** However, there is need to address the fundamental challenges that predisposed the sector to the liquidity challenges especially as the loan would be repaid from customer payments.

Conclusion

The objective of this essay is to explain some of the technical language in the power sector. Some of these terms will continue to reappear on this column as we seek to provide a better understanding of the sector.

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