

Losses and Poor Electricity Supply

The old adage “Money makes the world go around” is apt in describing one of the fundamental problems of the Nigerian electricity industry. The problem revolves around inadequate revenues, which undermines performance and viability. In a nutshell, the industry, as presently operated and regulated, is incapable of generating enough money to pay for: (a) gas used by the generating companies to produce electricity, (b) transmission facilities used in transporting the electricity from the power stations to distribution companies’ networks, and (c) distribution assets used in ultimately getting the electricity generated and transported to the final end users, namely, households and factories. The ensuing inadequacies and inefficiencies wreak havoc on gas supply, transmission, distribution and marketing businesses that are interlinked in the production and supply of electricity.

So what causes revenue shortage in the industry?

The production chain alluded to above implicitly traces costs of electricity services to respective sectors involved in the production and supply process. The cash paid by end users for the electricity they consumed is the only source of cash flow for the companies involved along the electricity industry supply chain. Any shortage in that cash flow will invariably reduce the cash available to some or all of the companies. In such a case, the implication is that they will not, in the short-term, be able to cover their operating expenditures, and in the long-term, capital expenditures for expansion and asset replacement will be negatively impacted. In short, as a result of energy losses along the supply chain, revenue collected is inadequate to meet the expenses incurred in the generation and onward supply of electricity. The expenses can be categorised as either energy or capacity costs. The former refers to direct cost of generating electricity and the latter to the gamut of equipment costs involved in the generation and supply of electricity to end users.

On the output side, what is observed in Nigeria is a significant discrepancy between electricity generation and consumption. This discrepancy, termed system losses, is above 25 percent. What NERC refers to as aggregate technical, commercial and collection (ATC&C) losses, is comprised of line losses across transmission and distribution networks, and commercial and collection losses, with respect to the energy delivered to the transmission network. When the latter set of losses are added to the network losses, the aggregate losses exceeds 55 percent – this compares unfavourably with global best practice of approximately 7 percent. ATC&C losses, according to figures published by NERC, range between 32 and 71 percent.

First, let us put the problems associated with losses in proper context. Total system losses at present stand at around 55 percent of electricity injected into the transmission network. What this implies is that on any given day, if the generating companies inject 3000MW into the transmission network, it is likely that revenues collected will only cover 1350MW of the total generation (compared to 2790MW if the system were operated in line with best practice). It follows that either the service providers bear the losses and accept non-payment of 1650MW or the incidence or burden of the losses is transferred to the end users by way of tariff increases. From a monetary perspective, the value of lost electricity, assuming 3000MW output and average end user tariff of N25/kWh, is approximately N360 billion per annum. For emphasis, that is about N1 billion per day. If tariff increase is opted for as the means to deal with this shortfall, 1350MW must be effectively rebased to amount to 3000MW by over 200 percent to make good the positions of generation, transmission and distribution companies – and by extension, the gas suppliers. Tariff increase as an option is fraught with issues such as regulatory lag (delay) as rate determination is a protracted process: the authorities have to balance increases with affordability, and the industry must contend with reduction in consumption by end users in response to higher prices. The overall impact is reduction in electricity consumed, which normally sets off a cycle of tariff increases. The implication of either tariff increase or poor financial performance are dire: reduced profitability and financial viability for the service providers and/or higher cost of electricity services to end users. The long-term result: inadequate and unreliable electricity services make it difficult for service providers to raise the capital required for investment to address losses and improve services.

This begs two questions: What is the source of the losses? Who bears the burden of the losses? The answer to the first question can be found in the ubiquitous revenue formula of price multiplied by output. If the regulated tariff is low or the discrepancy between electricity generated and consumed is significant, then revenues will be lower than expected.

What can cause tariff to fall below cost of service? Regulatory lag or poor calculation of unit costs, *ex post* production and cost inefficiencies. Since our focus is on losses, and given the importance of pricing, we will return to issues surrounding non-cost reflective tariffs in a different paper.

Another way of looking at losses is in terms of technical and non-technical categorisation. Losses ascribed to the former are as a result of the physics and engineering involved in transporting electricity. Losses ascribed to the latter category are caused by human omission or commission. By omission we mean inadequate energy accounting – especially in the aspects of billing, metering and collection. By commission, we mean wilful acts of

circumventing and undermining legitimate services such as theft, tampering with meters, non-payment of electricity consumed etc.

Since privatisation in 2013, the way revenue shortfalls have been dealt with by government is to avail the market participants of direct tariff support. The total sum expended since 2015 is in excess of N1 trillion. Put differently, government continues to plough cash into a predominantly privatised sector to address a problem that hitherto was non-existent. In addition to this, which effectively amounts to income redistribution, current regulatory practices compound the situation by allowing service providers to recover their entire asset base rather than what is actually used in supply of electricity. This practice encourages service providers to engage in “gold-plating” in the knowledge that all their assets will be included in the tariff determination thereby putting upward pressure on electricity tariffs. For instance, no more than a quarter of the total transformation capacity of distribution networks that is in excess of 20,000MW is used in distributing power to end users, yet the distribution companies, in principle, get paid for all. Apart from the fact that end users have to contend with higher tariffs, this practice impacts negatively on government’s fiscal position through tariff/market support and high-cost energy purchase obligations demanded by IPPs and gas suppliers.

The simple point is that the losses are just too high and neither make a good story for investment nor improvement in electricity services. This position is simply not sustainable – not for the government, not the service providers and certainly not for the end users. Something must be done urgently.

Slay the monster before it consumes everything in its path

The distinction along technical and non-technical lines gives insights into how the problem can be approached. Technical losses consistent with best practice (design and network operations) are considered to some extent to be non-discretionary due to the characteristics of electricity. Non-technical losses, on the other hand, are within the discretionary control of service producers. Some allowance is usually made for losses in rate setting but not to the extent we see in Nigeria. The level of ATC&C losses we see in the Nigerian electricity industry is essentially rewarding inefficiencies and poor practices. It effectively provides a disincentive to the distribution companies to undertake necessary loss reduction programs that will boost quantity and quality of power, and ultimately provide cheaper electricity. One of the reasons why residential customers dominate power consumption in Nigeria, contrary to what is observed in other countries, is that apart from the epileptic supply, the losses have amplified

the vicious cycle of incessant tariff increases and have indirectly made industrial customers uncompetitive, which have made many of them close down or relocate to neighbouring countries, while those that remain are buffeted by hostile operating conditions. These have combined to exacerbate socioeconomic problems and challenges such as unemployment, poverty, rural-urban development etc.

Another way of looking at losses is from an accounting perspective. The industry burns more gas than required, this is a resource that otherwise would be sold to enhance government revenues and fiscal position, not to mention ensuing environmental degradation. More investment in transmission and distribution facilities is required to address the losses as ultimately, high technical losses translate into losses to the nation, and high non-technical losses are corporate losses to the service providers. This situation is further compounded by a moral hazard problem on the part of the service providers as the losses are borne by end users and government.

What must be done?

The good news is Nigeria is not the first to contend with high losses as other nations who were in similar positions have successfully curbed and reduced them to tolerable levels. The bad news, however, is the attention of the industry is yet to be properly trained on losses - ATC&C performance targets ranging between 21 and 38 percent set by NERC are not stringent enough and performance of the distribution companies come nowhere close to those targets. This needs to change given the significance of electricity to economic growth and development. Irrespective of the argument that energy consumption drives economic growth or vice versa we subscribe to, the dragon must be slain if the nation is to see electricity play its rightful role as the engine of growth and development. Policymakers must take cognisance of the fact that simply committing public funds to transmission and distribution networks, or providing financial backing for the development of generating plants will not alter the fundamental problem caused by technical and non-technical losses.