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Cheap Electricity, Expensive Consequences

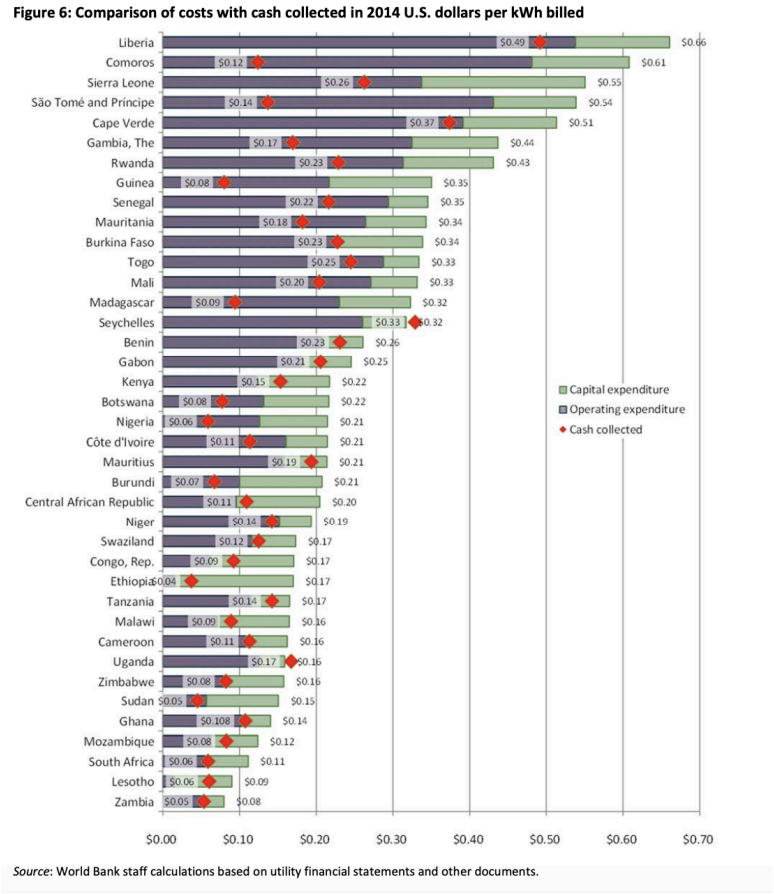
BLUF: Africa's electric utilities are caught in a death spiral. They are forced to charge below-cost tariffs, which degrades service quality, which encourages their best customers to exit, which worsens financial losses, and so on. The solution to better reliability lies in restoring utilities' financial viability. Smart policy design can achieve this when clearly balanced with other social objectives.

Why It Matters: Reliable electricity is necessary for economic growth. With current pricing structures, utilities cannot afford to invest in improving service quality.

Most power companies in sub-Saharan Africa lose money on every electron sold.

Only two countries in sub-Saharan Africa — Uganda and the Seychelles — have a financially viable electricity sector (Figure 1). Every other country relies on government subsidies to cover (at least) capital expenditures. Most record ongoing losses [1], and each additional customer they add to the grid further increases those losses, since the marginal cost of adding a customer is more than the new user provides in revenue [2]. In some countries, utilities charge customers less than half what it costs to provide them with power.

FIGURE 1: Comparison of revenue collected by electricity utilities and cost per kWh provided



Source: Trimble, Kojima, Perez Arroyo and Mohammadzadeh, "Financial Viability of Electricity Sectors in Sub-Saharan Africa Quasi-Fiscal Deficits and Hidden Costs". World Bank Policy Working Paper 7788, 2016. [1]

Electricity is priced so low for a reason: in theory, it makes electricity more affordable. Yet, artificially-low pricing creates significant problems that likely wipe out any benefits to both low-income consumers and industrial customers.

Fiscal losses mean unreliable electricity.

Utilities are caught in a bind. They are often highly regulated so cannot set their own prices or choose their own markets. At the same time, they are required by governments to continue providing power, they are under strong pressure to expand connections to the poorest customers, and they cannot cut service to non-payers (including government agencies). Given that most utilities are thus forced to lose money, they have few funds available for other objectives.

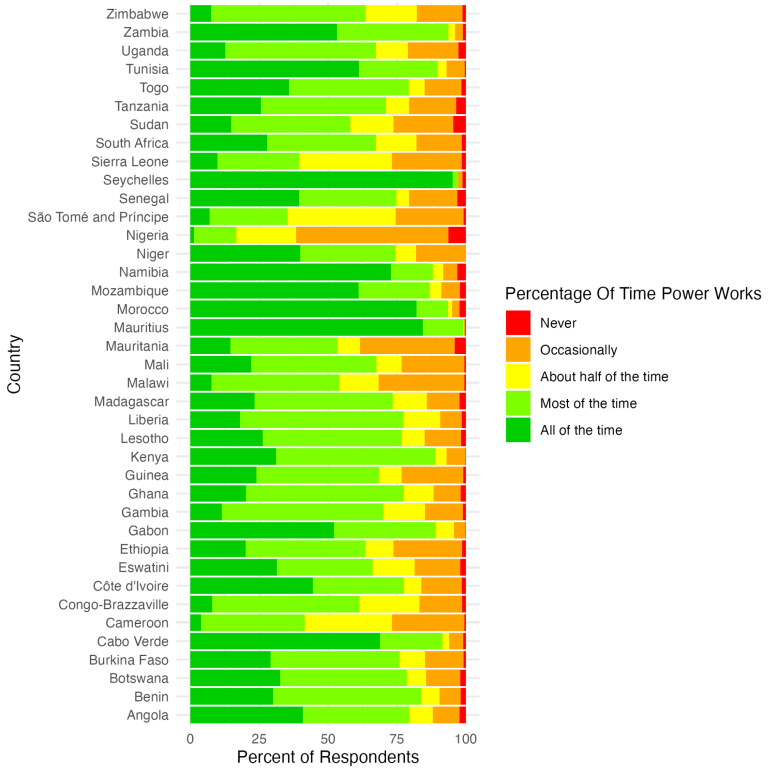
About half of utilities in sub-Saharan Africa earn enough to cover their operating expenses, but have no additional money for capital expenditures [1]. Almost all of the others can cover

neither. (In only two countries, Uganda and the Seychelles, can the electric utility cover both capital expenditures and operating expenses.)

This limits their ability to maintain or repair damaged power lines or to invest in grid management (an increasingly vital service as more intermittent sources are added to the mix). It also leaves little funding to add the additional generation capacity needed to serve sharply increasing demand [3]. Each new customer added puts more stress on the grid, and increases the need for quality improvements.

As a result, reliability suffers. Load shedding is common across the continent [4], as are unplanned outages [5].

FIGURE 2: Survey data from African consumers on how often their home electricity supply works



Source: Afrobarometer, merged data from 2023. [6]

Thus, in many countries, being connected to the main grid does not mean getting power.

Unreliable electricity only worsens the fiscal situation of utilities because it makes users less likely to pay their bills. In Ghana, those with less reliable electricity had significantly higher unpaid bills than those with more reliable electricity [7].

The utility death spiral

All of this means that African utilities collect too little revenue to provide good service, leading to frequent blackouts, which pushes consumers to find alternative power sources, which means even less revenue, and then worsening service.

Governments periodically bail out utilities so they don't shut down completely. For instance, South Africa has spent over US$14 billion bailing out its utility since 2010 [8]. But the same problems simply recur after each bailout.

The cost of repeated deficits and bailouts is substantial, averaging 1.5% of GDP across the region [1]. In São Tomé and Príncipe, South Africa, and Zimbabwe, the costs of electricity sector bailouts exceed 5% of GDP.

Pricing must match costs.

The only solution to this is to make more utilities financially viable. As long as they continue to lose money, there is little hope that reliability will improve — or that power investments will enable higher economic growth and job creation.

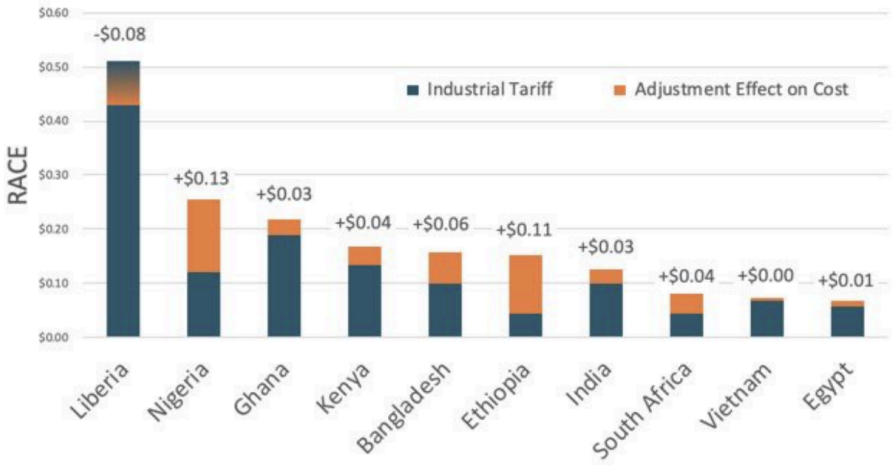
While viability will mean charging more for grid electricity, that need not mean that customers and businesses will be worse off.

True electricity prices are higher than they seem.

Because electricity in sub-Saharan Africa is currently so unreliable, higher-income and commercial customers typically supplement with power from generators, which is far more expensive than grid power. This means the effective amount paid for electricity in sub-Saharan Africa is much higher than the official price, once you add the cost of running a generator during the time grid power isn't available.

The below figure shows the reliability-adjusted price of electricity. This is an average of the official grid price and the price it takes to generate electricity via a generator, weighted by how much of the day the grid goes out. (For example, if grid power is only available eight hours a day (a third of the time), the grid power price receives one-third weighting, while the generator price receives two-thirds weighting.)

FIGURE 3: Preliminary Race in Ten Countries



Source: The Energy for Growth Hub, "The Reliability-Adjusted Cost of Electricity (RACE): A new metric for the fight against energy poverty". 2019. [9]

The reliability-adjusted cost of electricity is much higher than the official price. On average, Nigerian customers who need a continuous electricity supply don't end up paying the artificially low, official price of $0.12 per kWh. If they need to run a factory — or a restaurant, or a clinic, or any type of business that cannot survive with daily outages — they actually end up paying an average $0.25 per kWh when you consider the cost of operating a generator in the times the grid is down.

Charging these higher-income or commercial customers any price up to $0.25/kWh for grid electricity would be a better solution in every way. A higher price could cover the cost of reliable power provision and allow utility companies to pay both their operating costs and for capital investments [1]. This would also allow utilities to make the investments needed to improve reliability. Eventually, it is possible that consumers would no longer be forced to rely on loud, dirty, polluting generators at all. And if Nigeria priced electricity higher but increased reliability, the state might no longer be forced to bail out failing utilities, and the average consumer could *still* save money.

Furthermore, there is evidence that consumers would be willing to pay for more reliable power. Consumers in Senegal are willing to pay 10% more for 40% more reliable electricity, up to $0.44/kWh at peak hours [10]. This is well above what would be needed for Senegal's electricity sector to be financially viable [1].

Higher prices for some customers does not necessarily mean higher prices for all customers.

Sharply increasing prices for all customers might not be politically possible, particularly in countries where official prices are currently very low or where grid extension is a social or political objective. However, improving the financial viability of the electricity sector could be balanced with these other objectives through policy design. For instance:

- Steeply-tiered pricing structures, with a limited lifeline tariff for the poorest customers;
- Better delineation of new technology options, such as reaching remote low-income customers with off-grid systems to provide initial service without adding to financial pressure on the utility;
- Splitting institutional responsibilities for reaching poor communities from serving large commercial and industrial customers.

Uganda, which has one of the region's two viable utilities, does both. It uses a tiered pricing structure where a small amount of power is available (15 kWh / month) at a highly subsidized rate, to preserve access for low-income consumers, while prices rise for larger higher-income consumers [11]. At the same time, the main utility's mandate is to serve urban and industrial customers, while a separate agency is responsible for rural access.

Whatever structure countries use, it's clear that things must change for power reliability to improve. As long as utilities continue to lose money on both every marginal kWh provided and every marginal customer connected, there simply isn't the fiscal space for utilities to invest in reliability — or to expect that the power sector can drive economic growth and job creation.

Endnotes

1. Trimble, Kojima, Perez Arroyo and Mohammadzadeh, "Financial Viability of Electricity Sectors in Sub-Saharan Africa Quasi-Fiscal Deficits and Hidden Costs". World Bank Policy Working Paper 7788, 2016.
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