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Commercial & Industrial Solar PV: Threat or Opportunity for KPLC?

Privately owned distributed solar installations have been steadily growing amongst C&I customers in Kenya. Estimates of installed capacity range from 29 MW (UNEP-DTU) to 50 MW (Wood Mackenzie), and could reach 550 MW by 2025, driven primarily by cost savings and power reliability benefits to offtakers. The market is competitive and virtually unsubsidized, and most C&I projects in Kenya offer 15-35% Year 1 bill savings compared to current grid tariffs. Kenya Power (KPLC) has suffered significant losses and currently faces four fundamental problems with its revenue model:

1. **Declines in net income per customer** from connectivity campaigns focused on low-consumption users.
2. **Declining revenue from the roughly 700 anchor C&I customers**, who represent the majority **(54.8%)** of KPLC's sales revenue. These customers are increasingly favoring more cost-competitive and reliable captive power solutions like distributed solar.
3. **Low electricity demand growth**, estimated at 2.3% in 2019, far below the forecasted expectations of 7.3-9.6%.
4. **Cratering profitability** (net losses of nearly Sh3 billion in FY2020) driven by the issues noted above, as well as increasing debt burden, overpayment for idle generation capacity under take-or-pay contracts, and myriad technical and operational inefficiencies.

In the face of these challenges -- particularly C&I solar adoption among its anchor customers – KPLC recently pivoted to compete directly with private C&I installers. The Energy & Petroleum Regulatory Authority (EPRA) recently released the 2020 Draft Solar Regulations, which some perceive as red tape meant to slow distributed solar and protect KPLC and KenGen from losing further revenue, but EPRA maintains that it will encourage a more robust, sustainable sector.

How and to what extent Kenya's anchor electricity demand is ultimately met with C&I solar could be a bellwether for other regional utilities who may face similar questions in the future. Rather than paint itself into a corner beholden to revenues from a handful of captive customers, the Kenyan power sector can lead the way for utility evolution across sub-Saharan Africa. Based on experiences from electricity markets that have already incorporated and leveraged distributed generation, here are four considerations for state utilities in Sub-Saharan Africa facing distributed generation (DG)-enabled customer defection:

- **Utilities must either cooperate or compete with distributed generation.** Utilities and DG markets will inevitably intersect, but it is often up to the utility (and regulatory bodies) to set the terms. Most competition is for reliability of service and price, both areas where C&I solar and solar hybrids are often better positioned to offer attractive options.

    - State utilities should prioritize low, predictable costs, and strong reliability for anchor customers that underpin revenues. Business-friendly grid and net metering policies will reduce grid defection via fully captive projects.

- **Utilities should view DG markets as an opportunity, not a threat.** Most customers opting for solar are grid-tied without storage and are primarily trying to increase reliability and avoid daytime penalty charges, rather than completely defect from KPLC.
    - KPLC should see this as an important load shaving mechanism to help avoid expensive peaking fuel use or spinning reserve capacity investments. Many utilities now leverage customer generation and finance net metering or FiT policies. Healthy customer-side generation capacity also moderates future generation asset investments. This is important for KPLC given the current PPA freeze and the increased cost to customers from idle capacity under take-or-pay contracts.
- **Utilities need incentives to provide high-quality, low-cost, predictable service, particularly to anchor customers.** KPLC is rewarded based on volumetric sales, rather than the quality or reliability of that service. This is a primary reason why investments in system efficiency are limited, losses are on the rise (21% in 2019), and the resultant grid congestion means customers are charged steep penalties for higher day-time consumption (called "overconsumption"). In light of this, self-generation with solar PV is an increasingly attractive option for customers:
    - Quality and reliability are essential to growing industrial demand. Some of Kenya's neighbors, such as Uganda, have incentivized system loss reductions through penalty charges and efficiency rewards for the utility, which led to consistent reductions in system losses over the past 5 years.
- **Everyone can win.** KPLC is now looking to pivot into the C&I solar sector under a design-build-finance-operate model – it would own and operate the PV installation and sell power at the lower solar tariff to offtakers who would otherwise have procured a PV system privately. Though this will not solve the utility's fiscal woes, and competition with private C&I solar is steep, this is a strong market signal that KPLC intends to try and keep these critical anchor customers and prevent demand growth from slowing further.

The Kenyan power sector could lead the way for utility business model evolution in East Africa and beyond, and the growth of C&I solar procurements could either be a threat or an opportunity for KPLC. Prioritizing quality, low-cost service to anchor C&I customers, and influencing market conditions and regulatory incentives to foster mutual benefits from DG solar growth will pay dividends for the embattled state utility and power economic growth in new parts of the country.