Kenya's Distributed Generation Growth

Changing Utility Development

By Bailey Bearss

With nearly 1.1 billion people worldwide living without access to electricity, there is a global focus on increasing access to electricity in underserved areas of the world, especially in sub-Saharan Africa and South Asia.

Programs funded through government aid agencies and private sector investors are particularly invested in green energy solutions for rural populations in areas that are grossly underserved by the national grid. They have also been supported through global initiatives such as the United Nations Sustainable Development Goals. Investment in mini-grids and other sources of distributed generation is growing to meet such global electrification goals.

Distributed generation, utilizing smaller scale technologies to produce electricity closer to the end users of power, may be changing utility development in developing countries.

In many cases, distributed generators, often mini-grids powered by renewable energy or home solar power systems, can provide lower cost and higher reliability power with fewer environmental costs than traditional power generators.

In East Africa, small-scale mini-grids, typically powered by solar panels, directly link to distribution networks which can power a small village for vital electric needs. They involve drastically less investment in infrastructure than traditional grid expansion.

Mini-grids can be utilized for residential use, and they can also be used for local industry. Examples include agriculture, mining and small-scale manufacturing, as well as public services such as schools and health clinics.

This benefits rural populations by providing employment and changing the economy of villages in countries where most potential for economic growth has traditionally been held within areas served by the national grid.

Realizing the potential of mini-grids, a private Japanese company, Mitsui & Company, recently invested nearly one billion yen in OMC Power. OMC Power is an Indian mini-grid operator with plans to expand their business to sub-Saharan Africa and other areas of Asia where there is electricity demand from underserved populations.

Additional options in distributed generation are being developed by companies such as MKOPA Solar. Founded in Kenya, the company is a pay-as-you-go home solar energy system provider. It has grown to attain a regional East Africa presence.

Home energy systems are growing in popularity to address issues in rural electrification. Generally, a single user can pay a deposit fee for their own home solar system, which includes a solar panel to provide enough basic electricity to power a couple of lightbulbs, a phone charger and a radio.

Users pay off their system in installments. After completing the payment package, the customer owns the system. Users are then independent from any utility system and are able to start generating electricity immediately.

Small-scale mini-grids, typically powered by solar panels, directly link to distribution networks which can power a small village.

The increased success of distributed generation could change the way the world thinks about traditional brick and mortar utilities that serve thousands of customers through a large interconnected national grid.

In many East African countries, the largely vertically integrated government-owned utilities often struggle with a variety of issues. Those include stabilizing, determining cost reflective tariffs, and accessing investment in infrastructure to expand to rural populations.

Mini-grids and other distributed generation create a solution which, in some cases, allows customers to bypass the larger utilities altogether. There is a feeling of independence that comes with ownership of their own energy systems.

While private sector investment and community ownership of mini-grids is on the rise, some mini-grid development is being conducted by the government run utilities themselves. One example is in Kenya, where one of the main utilities, Kenya Power, is working to install its own mini-grids.

However, the lack of regulation surrounding the mini-grids makes the returns on project costs unclear and financial viability uncertain. An additional challenge with installations of distributed generation will be the future of national grid development as utilities plan to grow and expand.

Will the utilities eventually grow and interconnect with or between mini-grids? Will the investors or owners continue to function as independent power producers, or will they be swallowed up by the national utilities?

The need for regulatory and policy guidance makes the long-term future of mini-grids uncertain, though the short term economic and social benefits may outweigh that long-term ambiguity. PUF

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