

Kenya microgrid design

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Kenya: The World's Microgrid Lab report shows the global microgrid market is ready for significant private investment. While there still remain some challenges - especially around the regulatory framework and aggregation of projects - there are now enough businesses with viable business models to provide early stage, strategic or even crowd investors with commercially attractive opportunities.

"The medium-term growth potential for the microgrid market in Kenya, as well as in other energy access markets including in Africa, South and Southeast Asia, is very high," TFE Consulting writes in the executive summary of its report. According to TFE, a \$1.5 billion microgrid market opportunity exists in Kenya over the next five years.

This case study tells the story behind a research project on the economics of rural electrification in Western Kenya. The chapter covers (1) aspects of the policy and technology environment that initially guided the course of the work; (2) how the project pivoted away from solar microgrids and focused instead on the expansion of the national electricity grid; (3) unexpected challenges encountered while implementing a randomized evaluation of electricity infrastructure; (4) how we interpreted the study findings in light of consequential, concurrent changes to Kenya's electrification policies; and (5) possible directions for further research, motivated by our project experience.

In 2012, we began a study on solar microgrids in rural Kenya. Over time, it evolved into an experiment that randomized the expansion of the national electricity grid instead. In this chapter, I tell the story behind this project, focusing on the pivots and iterations that shaped the path of our research on the economics of electrification over nearly a decade.

When we started our project, access to electricity was widely seen as a major driver of economic development, just as it remains today. Then-United Nations Secretary General Ban Ki Moon famously referred to it as the "golden thread" connecting economic growth, social equity, and an environment where people could thrive. Supporting this outlook was the well-known, near-perfect correlation between electricity consumption and GDP per capita, which is shown in Fig. 5.1.

The positive correlation between electricity consumption and GDP per capita

Notes: Both variables are presented on a logarithmic scale. 2014 data obtained from the World Bank DataBank Reprinted from Lee et al. (2020b)

At the time, over a billion people still lacked access to electricity. The question of how governments could best expand access to power remained front and center. Moreover, developing countries were expected to drive a considerable amount of growth in global energy consumption (Wolfram et al., 2012). As a result, expanding access in these countries using conventional fossil fuel technologies would certainly accelerate global warming. The development challenge was clear: In countries with high rates of energy poverty, how could electricity access be expanded while mitigating the consequences on the global environment?

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