Microgrid development lusaka

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Standing in the bustling peri-urban settlement of Ngwerere, where nearly 1,000 Zambians live on the outskirts of Lusaka, you can see the power lines that follow the main road. But the residents here have never had access to grid electricity. That has not stopped enterprising business owners from setting up three video arcades and a movie theater, thanks to a 12-kilowatt solar array and battery bank installed by Standard Microgrid, which also provides power to grocery stores, hair salons, and nearly 100 homes.

Another experiment evaluates the effects of subsidies on consumer choice, to see if developers might increase revenues by lowering the price for power. The first results from this study found that for every dollar that customers saved in prices, they spent $0.93 on increasing their energy consumption. That is, despite substantial price reductions, developers saw revenues fall by just 7 percent.

Other interventions in progress will evaluate the effects of high-speed wireless internet, choosing between different metering technologies, and proactively connecting customers to the microgrid rather than waiting for households to sign up.

Results from the first experiment--market-rate loans for households and microenterprises to purchase appliances--also offer important insights. Among the nearly 2,000 customers in the program, about one in six bought at least one appliance, the most popular being televisions, refrigerators, speaker systems, and "decoders" set up to receive satellite television signals. Somewhat surprisingly, differences in income or wealth have little to do with the choice to buy appliances. Instead, prior electricity consumption has the largest impact, and having a bank account also helps. Among residential customers, larger households are more likely to purchase appliances, up to a point: The very largest households are less likely to do so.

Among the households that buy new appliances, median consumption more than doubles immediately (see Figure 1), though the long-run response is more measured. The consumption pattern suggests households may initially use the new appliances heavily, scale back somewhat as they adjust to higher bills, and then eventually readjust to a "new normal" level of usage that is moderately higher than before the intervention.

Most importantly, the results suggest there is latent demand among even poor households to use more electricity-intensive appliances, provided they can finance the purchases and have access to electricity at an affordable cost. In our current research, along with P.P. Krishnapriya, we are studying consumption patterns after the appliance loans are repaid, which may help to relieve household budget constraints.

Notably, the increase in consumption is far from uniform, and depends a lot on the appliances that people buy. The biggest increases are among customers who buy refrigerators and speaker systems--average consumption more than triples when the appliances are delivered. By contrast, customers who buy televisions, decoders, and hair clippers increase their daily consumption by much less. People who don"t buy any appliances also

consume more. This may be because of spillover effects; customers can still buy appliances from other sources even if they did not under the original program. Alternatively, it may represent consumption growth that would have happened without the program.

A number of questions remain to be answered, not least of which is whether the economics would work out in communities where developers lack access to grants to pay the upfront costs of appliances; for this program, these capital costs were covered by a generous grant from the Rockefeller Foundation. In the absence of a similar grant, it is not clear if developers should divert precious capital to customer loans instead of building more microgrids, or connecting more households. Another unanswered question is whether microgrids enable the creation or expansion of micro and small enterprises.

Nonetheless, the initial results are promising. Programs to increase average revenue per user can bring value for developers seeking to prove their business models in thin markets. Demonstrating the viability of these business models can also help convince policymakers that microgrids are economically sustainable and worthy candidates for supportive policies and programs. The mix of private profit and public support can help developers, funders, and governments build better infrastructure. That, in turn, can serve customers starved of the services that power provides, and improve the development prospects of communities such as Ngwerere.

Honorable Mathew Nkhuwa, Minister of EnergyHer Excellency Anna Maj Hultgard, Ambassador of Sweden to ZambiaMs. Langiwe Lungu, Executive Director, Energy Regulation BoardMr. Clement Silavwe, Chief Executive Officer, Rural Electrification AuthorityMr. Brian Somers, Standard Microgrid Chief Executive OfficerMr. Aaron Leopold, Chief Executive Officer, Africa Minigrid Developers AssociationSenior Government Officials presentFriends in the MediaDistinguished GuestsLadies and Gentlemen

It is a pleasure to be here this morning to participate in the ribbon cutting for Standard Microgrid"s 10th solar microgrid in Zambia.