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Does Providing Electricity To The Poor Reduce Poverty? Research Suggests Not Quite



Energy Policy Institute at the University of Chicago

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Informal settlement or shantytown outside Cape Town

Edward Miguel and Catherine Wolfram, both from UC Berkeley, contributed to this post.

The head of Swedfund, the development finance group, [recently summarized](#) a widely-held belief: “Access to reliable electricity drives development and is essential for job creation, women’s empowerment and combating poverty.” This view has

been the driving force behind a number of [efforts](#) to provide electricity to the 1.1 billion people around the world living in energy poverty.

But does electricity really help lift households out of poverty? My co-authors and I set out to answer this question. We designed [an experiment](#) in which we first identified a [sample of “under grid” households](#) in Western Kenya—structures that were located close to but not connected to a grid. These households were then randomly divided into treatment and control groups. In the treatment group, we worked closely with the rural electrification agency to connect the households to the grid for free or at various discounts. In the control group, we made no changes. After eighteen months, we surveyed people from both groups and collected data on an assortment of outcomes, including whether they were employed outside of subsistence agriculture (the most common type of work in the region) and how many assets they owned. We even gave children basic tests, as a frequent assertion is that electricity helps children perform better in school since they are able to study at night.

When we analyzed the data, [we found no differences between the treatment and control groups](#). The rural electrification agency had spent more than \$1,000 to connect each household. Yet eighteen months later, the households we connected seemed to be no better off. Even the children’s test scores were more or less the same. The results of our experiment were discouraging, and at odds with the popular view that supplying households with access to electricity will drive economic development. Lifting people out of poverty may require a more comprehensive approach to ensure that electricity is not only affordable, but is also reliable, useable, and available to the whole community, paired with other important investments.

For instance, in many low-income countries, the [grid has frequent blackouts and maintenance problems](#), making electricity unreliable. Even if the grid were reliable, poor households may not be able to afford the appliances that would allow for more than just lighting and cell phone charging. In our data, households barely bought any appliances and they used just 3 kilowatt-hours per month. Compare that to the [U.S. average of 900 kilowatt-hours per month](#).

There are also other factors to consider. After all, correlation does not equal causation. There is no doubt that the 1.1 billion people without power are the world’s poorest citizens. But this is not the only challenge they face. The poor may also lack running water, basic sanitation, consistent food supplies, quality education, sufficient health care, political influence, and a host of other factors that may be harder to measure but are no less important to well-being. Prioritizing investments in some of these other factors may lead to higher immediate returns. [Previous work](#)

by one of my co-authors, for example, shows substantial economic gains from government spending on treatment for intestinal worms in children.

It's possible that our results don't generalize. They certainly don't apply to enhancing electricity services for non-residential customers, like factories, hospitals, and schools. Perhaps the households we studied in Western Kenya are particularly poor (although measures of well-being suggest they are comparable to rural households across Sub-Saharan Africa) or politically disenfranchised. Perhaps if we had waited longer, or if we had electrified an entire region, the household impacts we measured would have been much greater. But others who have studied this question have found similar results. [One study](#), also conducted in Western Kenya, found that subsidizing solar lamps helped families save on kerosene, but did not lead children to study more. [Another study](#) found that installing solar-powered microgrids in Indian villages resulted in no socioeconomic benefits.