

InFOCUS

Ali Protik, Duncan Chaplin, Arif Mamun, John Schurrer, Divya Vohra, and Kristine Bos

Impacts of Actually Connecting to the Electric Grid in Tanzania

Actually connecting led to:

- increased use of electricity and electric appliances, including lights
- no clear impacts on use of liquid or solid fuels
- improvements in some educational outcomes: children studied 12 minutes longer at night, but also increased their TV watching by 73 minutes per day
- no clear impacts on health or safety outcomes, but increased electronic access to family planning and HIV information
- modest impacts on adult time use
- large positive impacts on various measures of economic well-being

The Millennium Challenge Corporation (MCC) recently invested in extending electricity lines in Tanzania. The impact of those extensions on a variety of household outcomes was limited, and this may be because fewer households than expected actually connected to the grid. We wanted to explore what the impacts might be if more households were to connect in the future. To do this, we compared outcomes of households that had connected to the electricity grid by 2015 with outcomes of similar non-connected households. We used baseline and follow-up survey data collected in 358 communities as part of an evaluation of a larger energy sector project funded by MCC and implemented in a large number of rural and peri-urban communities. The data came from about 8,900 households, almost none of which were connected to the grid at the time of the baseline survey in 2011. Because we used non-experimental methods, the results should be viewed with caution.

ENERGY USE

Connection to the grid had a large positive impact on the use of grid electricity while reducing the use of nongrid electricity. Connected households used about 82.7 kWh electricity per month from any source, which is about 70.5 kWh higher than usage among non-connected households (Figure 1). Being connected also increased the use of electric appliances and the amount of light consumed and reduced expenses for mobile phone charging. Unexpectedly, connection to the grid had no clear impacts on the use of liquid or solid fuels.

EDUCATION AND CHILD TIME USE

Connection to the grid increased the time that children spent on studying at night by about 12 minutes per day. However, impacts on the time that children watched television were much larger, at about 73 more minutes per day.

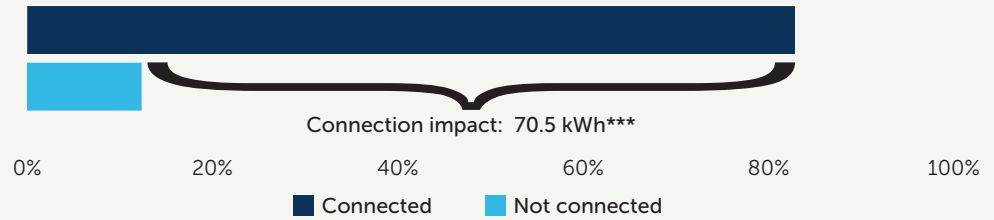
HEALTH AND SAFETY

Being connected to the grid had no clear impacts on health outcomes, perhaps because households continued to use about the same amount of liquid and solid fuel in the home. Nor did connection impact fires in the home, although those are rare to begin with. It did, however, increase by 10 percentage points the proportion of households that obtained family planning and HIV information electronically, compared with the figure of 50 percent for non-connected households.

BUSINESS AND ADULT TIME USE

Connection to the grid had only modest impacts on patterns of time use among women and men (reducing time spent on collecting water and fuel, but increasing time spent on socializing and resting, including watching television). Being connected did increase the share of households

Impacts of being connected to grid on electricity use in kWh



Source: Tanzania energy sector baseline and follow-up household surveys.

Notes: This analysis sample includes 8,897 households, with 1,189 in the connected group and 7,629 in the non-connected group. Impacts presented are regression-adjusted. Outcome is monthly amount of electricity used by household from any source in kilowatt hours (kWh).

*** Impact estimate is significantly different from zero at the 0.01 level using a two-tailed test.

Figure 1

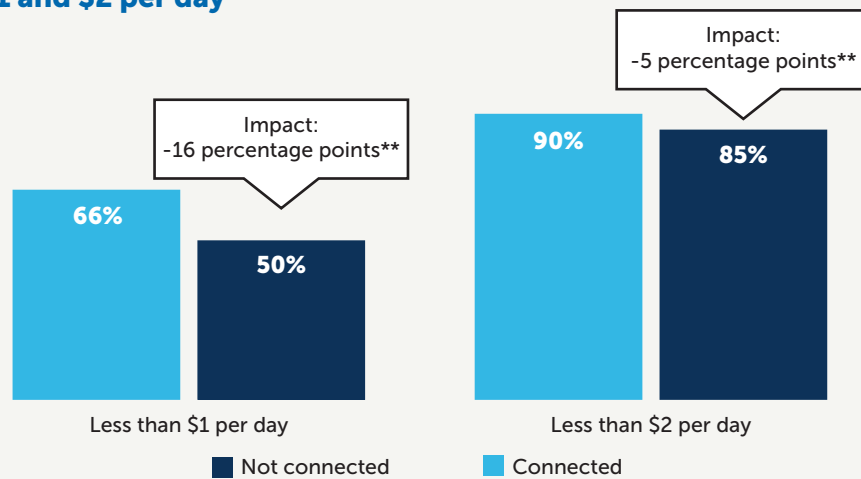
operating an electrified income-generating activity (IGA) by 26 percentage points. It also led to connected households having a higher revenue from their IGAs than non-connected households—58 to 83 percent higher, depending on whether the measure was monthly or annual.

ECONOMIC WELL-BEING AND COMPOSITION AND MOBILITY

We found large and consistent positive impacts of connection to the grid on various measures of

household economic well-being. Connection to the grid increased annual household non-electric consumption by 27 percent, annual household income by 49 percent, per capita daily consumption by 24 percent, and per capita daily income by 26 percent. Impacts were not only found for well-off households: the results showed that being connected reduced the percent of households with per capita consumption less than \$1 per day by 16 percentage points and the percent with less than \$2 per day by 5 percentage points (Figure 2).

Impacts of being connected on per capita consumption below \$1 and \$2 per day



Source: Tanzania energy sector baseline and follow-up household surveys.

Notes: The analysis sample includes 8,897 households, with 1,189 in the connected group and 7,629 in the non-connected group. Impacts presented are regression-adjusted.

** Impact estimate is significantly different from zero at the 0.05 level using a two-tailed test.

Figure 2

For more information, contact Duncan Chaplin at dchaplin@mathematica-mpr.com.

This brief is based on the report, "Grid Electricity Expansion in Tanzania by MCC: Findings from a Rigorous Impact Evaluation" by Duncan Chaplin, Arif Mamun, Ali Protik, John Schurrer, Divya Vohra, Kristine Bos, Hannah Burak, Laura Meyer, Anca Dumitrescu, Christopher Ksoll, and Thomas Cook. Washington, DC: Mathematica Policy Research, February 2017.

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