PUBLISHED: 9 MAY 2017 | VOLUME: 2 | ARTICLE NUMBER: 17078

research highlights

OFF-GRID ELECTRICITY

For comfort but not for work

Energy Sustain. Dev. **37,** 33–50 (2017)

The adoption of off-grid solar photovoltaic (PV) solutions in Africa is improving basic energy access, showing noteworthy sales volumes. The majority of this market (95%) is represented by small-scale solutions that can only power one or two LED bulbs and recharge a mobile phone. The remaining market is represented by solar home systems (SHSs) consisting of larger solar PV and an external battery that allows users to power up to five bulbs and several mobile phones. However, energy access projects, driven by development agencies and donor programmes, often overlook the needs and requirements of rural households in Africa. The literature also provides scarce understanding of populations' priorities that might diverge from those of sponsoring institutions that often focus on environmental and health concerns rather than households' requirements. Ognen Stojanovski, Mark Thurber and Frank Wolak from Stanford University analyse the results of an original survey conducted in two rural communities in Uganda and Kenya to explore precisely the usage patterns of SHSs.

The researchers use data from 375 and 190 customer interviews conducted at two sales points, in Uganda and Kenya, respectively. The interviews were conducted with new owners of SHSs at the time of purchase, the time of installation and three to six months after purchase. The evidence shows that SHS adoption immediately gives rise to an almost complete switch from kerosene lamps towards modern, high-quality lighting systems. In addition, out-of-the-house mobile charging fell dramatically in both countries with a reduction of over 70% after SHS adoption. However, the survey shows no increase in electricity usage for income-generating activities. This is mainly due to the incompatibility of the existing stock of appliances, including sewing machines, laptops and even TVs and radios, with SHS systems. These mixed results seem to challenge the assumption that off-grid PV might directly generate additional income streams for adopters and finds no evidence that SHSs are effective, aside from improving domestic comfort. Taken altogether these findings provide an important indication that efforts to increase PV penetration might still suffer from obstacles related to system design and an inability to operate existing appliances. ❐

Alessandro Rubino