A First Step up the Energy Ladder? Low Cost Solar Kits and Household’s Welfare in Rural Rwanda

Michael Grimm, Anicet Munyehirwe, Jörg Peters, and Maximiliane Sievert

Abstract

More than 1.3 billion people in developing countries are lacking access to electricity. Based on the assumption that electricity is a prerequisite for human development, the United Nations initiative Sustainable Energy for All (SE4All) has proclaimed the goal of providing modern energy to all by 2030. In recent years, Pico-Photovoltaic kits have become a lower cost alternative to investment intensive grid electrification. Using a randomized controlled trial we examine uptake and impacts of a simple Pico-Photovoltaic kit that barely exceeds the benchmark of what the UN considers as modern energy. We find significant effects on households’ budget, productivity and convenience but also the environment. Since only parts of these effects are internalized, underinvestment into the technology will be the consequence. In addition, our data shows that adoption will be impeded by affordability, suggesting that policy would have to consider more direct promotion strategies such as subsidies or financing schemes to reach the UN goal.

JEL: O13, O18, Q41, D13, I31.

Keywords: Energy access, household productivity, household technology adoption, Sub-Saharan Africa, Randomized Controlled Trial.

---

1 Michael Grimm, University of Passau, Erasmus University of Rotterdam, and IZA; Anicet Munyehirwe, IB&C Rwanda; Jörg Peters, RWI and AMERU, University of the Witwatersrand, Johannesburg, South Africa; Maximiliane Sievert, RWI.

Christoph M. Schmidt and participants of the Centre for the Studies of African Economies conference in Oxford/United Kingdom in March 2015 provided valuable comments. The data underlying this research was collected for an impact evaluation commissioned by the Policy and Evaluation Department of the Ministry of Foreign Affairs of the Netherlands (IOB). Peters and Sievert gratefully acknowledge the support of a special grant (Sondertatbestand) from the German Federal Ministry for Economic Affairs and Energy and the Ministry of Innovation, Science, and Research of the State of North Rhine-Westphalia. All correspondence to: Maximiliane Sievert, RWI, Hohenzollernstraße 1-3, 45128 Essen, Germany, e-mail: sievert@rwi-essen.de, phone: ++49-201-8149-323