Decreasing Emissions by Increasing Energy Access? Evidence from a Randomized Field Experiment on Off Grid Solar Lights in Kenya, joint with Adina Rom and Isabel Günther

Both human-driven global climate change and the widespread energy poverty in low- and middle-income countries are among the most pressing challenges of our times. This paper analyzes an intervention that addresses both. Over 750 million people globally still lack access to electricity. Many of them use kerosene for lighting, a strong global warming pollutant. In addition, kerosene lights generate indoor air pollution and steep financial costs for the households. This paper presents experimental evidence from Kenya on the impact and cost-effectiveness of solar lighting in addressing these issues. We find that access to a solar light significantly reduces the use of kerosene-fueled lamps and thus CO2 and black carbon emissions. In addition, we find substantial private gains for households, of almost 59% lower total household energy expenditures, and health improvements of about 0.26 standard deviations. While households gain private returns to buying a solar light, subsidies have a strong impact on take-up. Given the environmental externalities, distribution of free solar lights in areas with high use for kerosene lamps may therefore be a cost-effective intervention for CO2 reduction, while at the same time increasing the welfare of the poor.