

Shedding Light On Solar Lanterns in Uganda

A Spotlight on Solar Sister, MIT CITE Partner in Uganda

Innovators Connecting to Accelerate Global Development

The Story

Across rural Africa, millions of people lack access to electricity. Currently, many villagers use expensive and often dangerous kerosene lamps to fulfill their needs, but this solution is, at best, temporary. Unlike kerosene lamps, which can emit toxic fumes from burning fuel, solar-powered lanterns are a much safer, cleaner and more energy-efficient alternative. At MIT, the team behind the Comprehensive Initiative on Technology Evaluation (CITE) is working diligently to compare and evaluate the features of different solar-powered products in the market through testing both in Uganda and at MIT. The testing is part of the effort to refine CITE's methodology which aims to rank various products on suitability, sustainability and scalability, so that donors, and eventually consumers, can make informed decisions about the products they purchase.

Solar Sister, one of CITE's partners in Uganda, describes the lighting challenge and its vital relationship to economic stability. "In sub-Saharan Africa, where most of the rural population has access to electricity, solar is the perfect energy source to eliminate energy poverty, as it takes advantage of their most abundant resource, the hot African sun. By replacing the need to buy kerosene every week, families have a safer, cleaner, and brighter energy source, and they can save up to 30% of their household expenses. That money is then invested in children's education, the family's health, or new income opportunities. Giving access to solar technology has a tremendous ripple effect."

To understand the needs of lantern users, CITE conducted its first pilot evaluation by looking at how solar lanterns are chosen and used in Uganda. As there are many products available, it was important for the CITE team to understand

what features both consumers and donors value most when choosing which solar product to buy or invest in. This past summer, MIT researchers traveled to Uganda to better evaluate the lighting needs of the off grid communities with which Solar Sister works.





Among them were three MIT graduate students - Tess Skot, Amit Gandhi and Victor Lesniewski.

Working with partner organizations such as Solar Sister, (a USAID Development Innovation Ventures grantee), the team set out to learn more about how Ugandans use solar lanterns. They conducted interviews with Solar Sister employees and with end users, gathering extensive socioeconomic data and information on lighting use. At the same time the team left lantern samples instrumented with various sensors with 50 households to record actual lighting use patterns. This information was instrumental in designing laboratory testing back at MIT.

Field testing is difficult work, but it is an essential component of a complete evaluation. Jonars Spielberg, an MIT researcher who participated in the Uganda trip, had the opportunity to work with villagers in order to understand their needs. "With evaluation work, context is everything, which means there's no substitute for getting on the ground...For me, completing fieldwork in Uganda for this project was critical because it allowed me to observe details that weren't accessible any other way. Having this very local knowledge is a key ingredient in CITE's ability to provide insight on technology innovation."

A second team, based in Cambridge, MA and composed of graduate student Chris Pombrol; Professor of Mechanical Engineering, Dan Frey; former vice president and Technical Director of Consumer Reports, Dr. Jeffrey Asher; and CITE's Associate Director Derek Brine, engaged in a thorough technical analysis of 11 solar lantern models. The team developed technical tests based on the ways solar lanterns are used to determine which products would serve the needs of users in Uganda more effectively.

While setting up the proper protocols and processes for accurate testing takes time and resources, the experts working at CITE are confident that by the end of each testing exercise, they'll be able to provide valuable evaluations on available technologies to businesses, consumers and development practitioners who are seeking the most cost-effective tools to address the challenges facing emerging markets. CITE is looking forward to equipping development institutions, and ultimately consumers with the necessary tools to make the best purchasing decisions.

To learn more about Solar Sister, a CITE partner, visit their website at www.Solarsister.org.

For more information

www.usaid.gov/hesn