Public Market Report:
Solar Mini-Grid Workshop: Regulatory Framework and Quality Assurance

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PUBLIC MARKET REPORT

Solar Mini-Grid Workshop: Regulatory Framework and Quality Assurance

September 29, 2016
8:30 AM – 5:00 PM
Safari Park Hotel
Nairobi, Kenya

BACKGROUND

Solar mini-grids have long served as an efficient means of electrifying rural areas in developing countries. In sub-Saharan Africa, more than 600 million people lack access to electricity, the majority of whom live in rural areas that will not gain access to national power grids in the foreseeable future. Energy deficiencies are particularly profound in East Africa, where less than 22 percent of the population had access to electricity in 2015 compared with the 33.5 percent SSA average.[1] To address this energy deficiency, Kenya has set an ambitious goal of nationwide electricity access by 2030.

For Kenyan populations residing in remote locations with rugged topography, solar mini-grids provide a practical alternative. Renewable energy mini-grids are less dependent on large-scale infrastructure and can be placed in service more quickly and economically than the national grid. For these reasons, energy experts estimate nearly one-quarter of Kenya's population will be best served by mini-grids in the near to medium term.[2]

Recognizing that the private sector will play an essential role in electrifying rural communities, Kenya has begun to create a more investment-friendly environment for renewable energy. This focus has helped the Kenyan energy sector become one of the most active in Africa. In 2015 alone, Kenya received $4 billion in renewable energy investments, the second most in Africa.

As investment in off-grid energy expands, the policy environment becomes a critical factor for solar mini-grid implementers and suppliers. Stakeholder engagement in the policy-making process and the establishment of clear rules for the off-grid sector by African governments is essential to ensure U.S. companies are included in the market. Policy conducive to private utility providers will also help to facilitate quality, off-grid energy access throughout Africa.

WORKSHOP SUMMARY

In this context, the American National Standards Institute (ANSI), through the support of the U.S. Trade and Development Agency (USTDA) initiative the U.S.-Africa Clean Energy Standards Program (CESP), held the "Solar Mini-Grid Workshop: Regulatory Framework and Quality Assurance" in Nairobi, Kenya on September 29, 2016. The workshop addressed three important topics pertaining to the solar mini-grid space: pricing and billing, quality assurance, and grid integration.

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[1] UNIDO. (2016). "2016 East African Community Renewable Energy and Energy Efficiency Regional Status Report."
[2] ESMAP. (May, 2016). Upscaling Mini Grids for Least Cost and Timely Access to Electricity Services." Retrieved from https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/9515-ESMAP_Mini%20Grids%20Progam%20Booklet_Web.pdf

The solar mini-grid workshop featured presentations by U.S. and Kenyan experts from both the public and private sectors. Presentations focused on key aspects of solar mini-grid system development with the objective of fostering discussions among U.S. and Kenyan experts regarding regulatory challenges and opportunities in the Kenyan market as well as crosscutting issues affecting other East African markets and beyond.

Seventeen speakers discussed varying aspects of the African solar off-grid standards and regulation. Three U.S. private sector speakers from MRIGlobal, PowerGen, and Renewvia provided expertise from field experience, while the remaining 14 speakers were composed of a variety of African, U.S., and international mini-grid experts including the Kenya Power and Lighting and the Energy Regulatory Commission (ERC).

Due to considerable support and suggestions from the U.S. Department of Energy, Power Africa, and the U.S. company, PowerGen, three European speakers were included in the workshop agenda. These organizations included: Economic Consulting Associates (ECA), GIZ, and Trama TechnoAmbiental (TTA). Together these three organizations added unique experience and value to the workshop agenda. In particular, ECA and TTA recently released a report analyzing the regulatory environment for renewable energy mini-grids in East Africa.

The workshop was attended by 85 participants from eight countries: Germany, Italy, Kenya, Liberia, South Africa, Spain, Tanzania, and the United States. Attendees included twelve U.S. companies, such as PowerHive and Electrical Power Design, and multiple foreign government officials from the Kenya Ministry of Energy and Petroleum and the Liberian Rural Renewable Energy Agency.

Links to a flyer, photos, the final agenda and presentations from the workshop are available for on the U.S.-Africa CESP web site: www.StandardsPortal.org/us-africacesp

MARKET OPPORTUNITY

Worldwide, an estimated 25 million households rely on off-grid solar as their primary or secondary energy source. By 2020, this number is expected to increase to 99 million. During this period, the retail value of the off-grid solar market is projected to grow to approximately $3.1 billion with the highest market potential in sub Saharan Africa (SSA).[3] Among SSA regions, East Africa is expected to emerge as a highly lucrative market for off-grid solar products due to low electrification rates, rising government intervention, and expanding product awareness among consumers.

Only 33.5 percent of the SSA population has access to electricity, with the majority living in rural areas that will not gain access to the national grid in the foreseeable future. Energy deficiencies are even greater in East Africa, where less than 22 percent of the population had access to electricity in 2015.[4] To address energy gaps, East African governments are shifting away from public ownership and management of energy distribution, generation, and transmission to meet the energy needs of rural communities. For example, in 2014, PowerHive became the first company to receive a utility concession from the Kenyan ERC to construct and operate 100 PV solar mini-grids across western Kenya.

[3] Lighting Global (February, 2016). "Off-Grid Solar Market Trends Report 2016." Retrieved from https://www.lightingglobal.org/launch-of-off-grid-solar-market-trends-report-2016/

[4] UNIDO. (2016). "2016 East African Community Renewable Energy and Energy Efficiency Regional Status Report."

Kenya has begun to incentivize private sector investment by removing its VAT tax on all solar products, implementing Feed-in-Tariffs, and developing a National Electrification Strategy. The nation's emphasis on renewables has made the Kenyan energy sector among the most active in Africa. In 2015 alone, Kenya received $4 billion in renewable energy investments, the second most in Africa. Further, Kenya ranks second for clean energy investment on the continent and is the world's 8th largest producer of geothermal energy.

Kenya has high potential for solar power generation receiving high daily insolation rates and more than 30 percent of Kenya's off-grid population already uses solar PV installations.[5] According to Transparency Market Research, the value of the off-grid solar lighting market in Kenya was more than $85 million in 2015.[6] Due to the growing government focus on renewable energies, more affordable pricing, and increased consumer awareness this market is likely to expand rapidly in the coming years. Transparency Market Research estimates that, by 2024, the addressable off-grid solar market in Africa will include 44 million households with a retail value of $2.12 billion.[7] However, while there is vast market potential, uncertainty surrounding the long term strategy for off-grid applications and consumer pricing expectations has slowed growth in the Kenyan solar energy sector.

The Kenyan Energy Regulatory Commission is in the process of adding clarity to the off-grid sector by writing sector-specific regulations and addendums. The pending Draft National Energy Policy (2015) and Energy Bill (2015) include provisions supporting the development of mini-grids; however neither explicitly defines mini-grids nor their expected role in national electrification strategies. These policies also create an implicit limitation on mini-grids to electrify isolated, off-grid areas where the most practical mini-grids could be either grid connected or serve as intermediaries to fast track electrification of areas to prepare for future grid connection. The limitations of current regulatory policy demonstrate the need for clear, off-grid specific policies and the adoption of internationally-accepted codes and standards to permit Kenyan and East African markets to expand electrification by gaining full access to U.S. manufacturers and service providers.

[5] Laurea (2009). "Kenya's Renewable Energy at a Glance." Retrieved from https://www.laurea.fi/en/document/Documents/Kenya%20Fact%20Sheet.pdf

[6] Transparency Market Research. (May, 2016). "Off-Grid Solar Lighting Market by Type and Geography - Global Industry Analysis, Size, Share, Growth Trends, and Forecast 2016 – 2024." Retrieved from http://www.prnewswire.com/news-releases/off-grid-solar-lighting-market-by-type--solar-home-systems--and-large-solar-home-systems--and-geography---global-industry-analysis-size-share-growth-trends-and-forecast-2016---2024-300289608.html

[7] Ibid