

RENEWABLE ENERGY TRENDS

An East African Quarterly Newsletter Tracking the Sector

Quarter 1, 2014



Opening Thoughts



Greetings from Nairobi!

2013 saw some exciting trends in the global and African renewable sectors. 2014 promises to be even more exciting and ASD is thrilled to be involved in renewables in this region.

In 2013, with Marge, ASD finalized work on a national solar PV project in Rwanda that built vocational training capacity and formed a solar energy association. With the East African Community, we studied solar and

biomass value chains and identified investment opportunities in the region. We continue to conduct energy audits and design solar energy systems, with active clients in Kenya, Somaliland, Tanzania and Djibouti.

ASD continues its pioneering mini-grid work. We are paying careful attention to 'green' mini-grids for off-grid energy supply, as governments, private sector and

donors look to build business models and policy environments to provide energy access in remote locations. We look forward to installing several mini-grid pilots in northern Kenya this year.

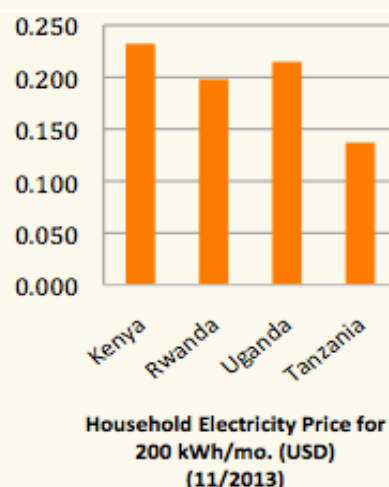
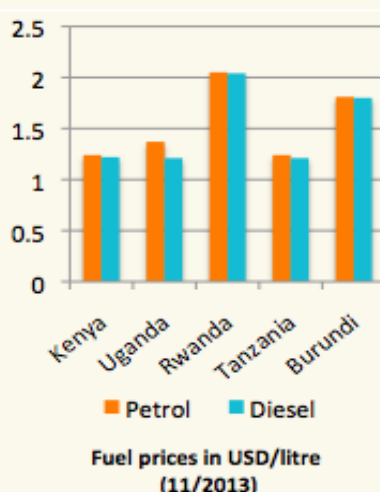
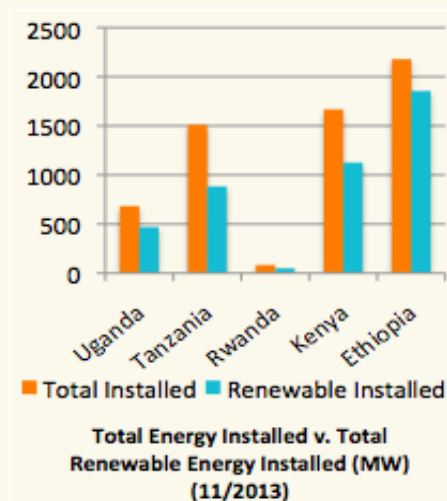
We are keen to develop ways to help on- and off-grid consumers lower their electricity bills -using energy efficiency, solar PV or solar water heating. Going forward, we see corporate and middle class use of renewables becoming as important as the use of renewables in energy access for rural areas. ASD sees a private sector driven renewable energy future.

Three years old, ASD now has 10 staff working at our Life Ministries office in Kilimani. Please do get in touch if we can help you! And check out our new logo!

Mark Hankins

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Energy Numbers



SunCulture's Solar Irrigation Product

Upon securing KES 20 Million (\$230,000) in seed capital, Charles Nichols and Samir Ibrahim left their jobs in New York City in 2012 and relocated to Nairobi to start a company making use of solar energy to irrigate farms in Kenya.

SunCulture designs and sells solar-powered irrigation systems and agricultural extension services that make it cheaper and easier for farmers in Kenya to grow high-value fresh fruits and vegetables. SunCulture's AgroSolar Irrigation Kit delivers water directly to crop



installed 26 additional AgroSolar Irrigation Kits. They have seen significant demand for the product from farmers and organizations around Kenya and greater Africa. The company aims to have 1,500 acres irrigated using the AgroSolar

“Kenyan farmers rely on petrol water pumps that are costly and ineffective”

roots, resulting in yield gains of up to 300% and water savings of up to 80%. The Kit also uses a system called *venturi fertigation* to distribute fertilizer via the drip system.

Co-founder Charles Nichols says they decided to introduce a product that will tap solar energy to power irrigation after realizing 83% of the 5.4 million hectares of arable land in Kenya is unsuitable for rain-fed agriculture and needs irrigation and pumping technology. “Many Kenyan farmers currently rely on petrol water pumps and flood irrigation methods. This is both costly and ineffective,” says Nichols. “By utilizing SunCulture's AgroSolar Irrigation Kit, the typical farmer saves KES 94,000 (USD \$1,100) on fuel, labour, and fertilizer per growing season while increasing revenues by KES 301,000 (USD \$3,500) per season due to increased crop yield.”

Since concluding the pilot phase in May 2013, SunCulture has sold and

Irrigation Kit by the end of 2015.

Currently, farmers using the AgroSolar Irrigation Kit are growing 1.7 million kgs of high-value fresh produce per year — worth over KES 34 Million (USD \$395,000). Agriculture is the largest contributor to Kenya's gross domestic product, accounting for 24% of the GDP, as well as for 74% of employment and 50% of revenue from exports. SunCulture's AgroSolar Irrigation Kits are benefiting the agriculture sector by increasing smallholder production efficiency through reduced input costs and increased yields, thus enhancing food security and national growth.

The AgroSolar Kit shows how renewable energy can be used to stimulate agriculture, boost economic growth and support community development.

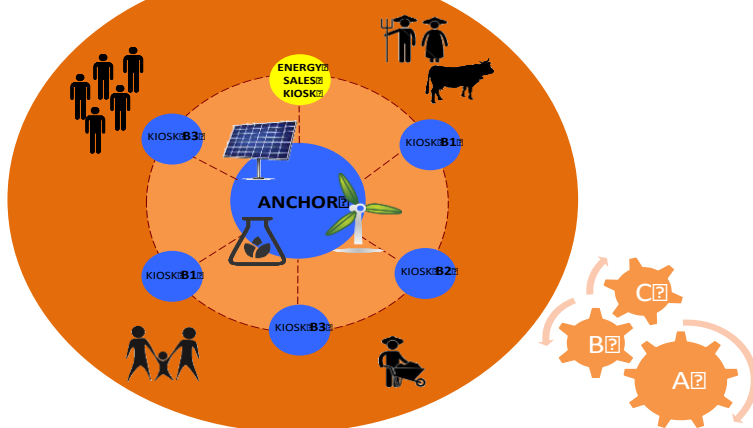
For more information check out the SunCulture website at www.sunculture.com.

Nuggets

- [Tea farmers set to gain from cheaper solar solutions](#)
- [Kenya set record straight on solar goals](#)
- [Top ten solar PV manufacturers from 2000 to present: A pictorial retrospective](#)
- [E.U sets 40% carbon target for 2030 and bidding renewable energy target](#)
- [Kenya Postpones Renewable Energy Drive to Reduce Power Costs](#)
- [Paula Mints: The First Solar Energy Top Ten List of Things to Remember as We Exit 2013](#)
- [KPLC to raise prices to 13% to large-scale power users](#)
- [Ethiopia way ahead of East Africa in wind uptake. 120MW opening up](#)
- [Rwanda: Rural Communities to Get Solar Power](#)
- [Malawi committed to renewable forms of energy - opens 830kW solar farm](#)
- [Coca Cola gets into the solar kiosk business](#)
- [Africa's Largest Hydroelectric Project May Hit the Rocks](#)
- [Leave aside corruption. Kenya's green energy future does not need coal!!](#)

Designing Mini-grids for Off-grid Energy

The A-B-C Mini-grid Model



With the electricity access gap in Africa still being a huge challenge to development, mini-grids are being used as a tool to make electricity accessible to the many people living in the off-grid areas. Some studies have estimated that mini-grids would be able to reach as much as 25% of the currently off-grid population in the region. In recognition of this potential, many government rural electrification programmes in East Africa have been supporting the roll out of mini-grids. Tanzania is supporting this through its Rural Energy Agency (REA) with 30-40 mini-grids in the pipeline, while the Kenyan government is planning the rollout of scores of mini-grids in rural areas. In Uganda the trend is the same where the government has been supporting the use of mini-grids to make electricity more accessible.

The donor community has shown strong interest in supporting governments to roll out mini-grids in East Africa. Organisations such as

DFID, Power Africa, the EU, the Norwegian Government, AFD and KfW are active in this space, funding feasibility studies, business model development, market assessments and more for both hybridisation of existing mini-grids and implementation of new sites. Between USD 150-200 million is likely to be spent on mini-grid projects across the region over the next 4 years, with a number of donor-funded projects already underway.

Hybridisation of two or more technologies is also becoming more common, as governments and project developers see economic and environmental benefits to use of renewable energy. Solar PV-diesel hybrid and biomass-fueled 'green' mini-grids are seeing particular growth, while small hydro continues to be a first choice because of its low costs. These are gradually being combined with or replacing conventional diesel engines, which are costly to run and highly polluting.

The A-B-C operating model (see figure) is currently being tested for economic and technical viability across the region. An Anchor load is provided by a large power consumer, and nearby Businesses and the local Community off-take smaller amounts to round out the business model.

Mini-grids are not only for rural energy access; they have applications for private sector clients in off-grid tourism, telecoms, agriculture and more. ASD believes that there is as much potential for private sector managed mini-grids that directly supply business as there is in mini-grids for community energy access. This market may be easier to develop because it needs less policy development and regulation.

African Solar Designs is involved in several projects involving green mini-grids from both a technical angle and looking at the market and regulatory context. We believe in their potential and are working to understand the viability of different operational, business and hybridisation models on the ground. Last year, with Basecamp Foundation, African Solar Designs commissioned an 11.25kW solar PV-diesel mini-grid facility at Naboisho Conservancy in Maasai Mara.

For more information, questions and comments, send us a note at info@africansolardesigns.com. We'd love to hear from you.

About this newsletter

Renewable Energy Trends is a quarterly newsletter produced by ASD in a deliberate move to share its knowledge and expertise of the East African region that spans over 25 years. We cover emerging innovations and technologies and showcase energy trends in the region to paint a picture of the sector and the direction it is taking.

At ASD we provide a range of technical, consultancy and capacity building assistance in the renewable energy sector with a focus on commercial and rural energy solutions.

We have just launched our new logo as we continue strengthening our brand in the renewable energy sector. Also keep an eye out for our new website, coming soon at www.africansolardesigns.com!