

# The Sun Also Rises

First, Africa ditched landlines for mobile phones.

Now, thousands of families have rent-to-own OFF-GRID SOLAR SYSTEMS, which provide cheap, clean energy.

*text Andrea Dijkstra*

"THIS SOLAR PANEL has really changed our daily lives," says Massai woman Harriet Manga, who's pointing at a placemat-sized solar panel, which is attached to the tin roof of her home in Kajiado County, Kenya. "We didn't have any electricity before, so we used a kerosene lamp to illuminate our house. Now we have light bulbs in every room, my children can do their homework at night, and with the help of a rechargeable torch, we can milk our cows and get safely to our outhouse toilet."

## EMPOWERING THE POWERLESS

With renewable energy prices rapidly plunging – notably the cost of hardware such as solar panels and low-energy light bulbs – and old nickel cadmium batteries being replaced by high-performance lithium batteries, energy is becoming affordable for all. And this is significant because about a third of Africa's are still without any form of electricity.

Thanks to these developments, a growing number of start-ups are offering various off-grid solar systems to low-income consumers in remote areas where the grid has failed to reach. One of these so-called "pay-as-you-go" (PAYG) solar firms is M-KOPA Solar, which is the worldwide market leader of PAYG solar energy for off-grid customers. The company was founded by the same people behind M-Pesa (Kenya's transformational mobile money solution).

M-KOPA Solar's cheapest home kit includes a solar panel, a control unit (with a USB port for charging mobile phones), four low-energy LED light bulbs (one of which is a portable, rechargeable torch) and a rechargeable radio. >

## Seven Solar Businesses Lighting up The Continent

- **M-KOPA Solar** introduced the "pay-as-you-go" plan in Africa, and now has over 500,000 customers in Kenya, Tanzania, Uganda and Ghana.
- **Azuri Technologies** sells solar home systems and now operates in 11 countries across Sub-Saharan Africa.
- **Solynta Energy** installs solar systems in homes, businesses, schools and clinics, and opened the first solar-powered filling station in Abuja.
- **Powerhive** currently operates 20 solar micro-grids that serve 4,000 households in western Kenya, and is expanding to Uganda and Nigeria.
- **Off Grid Electric** powers over 100,000 homes and businesses across Tanzania, Rwanda and Côte d'Ivoire, and distributes thousands of new solar home systems.
- **Black Star Energy** currently operates six solar micro-grids, providing electricity to 1,750 people in Ghana.
- **SolarNow** has over 17,500 customers in Uganda and sells TVs and fridges that can be connected to its solar home systems.



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Buyers pay US\$30 upfront, and then settle the balance in daily payments of US\$0.48 (through mobile money system M-Pesa) for a year, bringing the overall costs to about US\$205. When all the payments have been made, the whole system belongs to the customer, who can also decide to upgrade it to a more sophisticated system that can even run Africa's first solar-powered digital TV, a small, power-efficient flatscreen unit. M-KOPA Solar has sold more than 70,000 of these TVs since February 2016.

Having connected over 500,000 homes in Kenya, Tanzania, Uganda and Ghana since launching in 2012, M-KOPA Solar claims to connect 500 new homes every day. According to a recent survey by the GSM Association, over 800,000 PAYG solar home systems have been sold worldwide, with 95 percent of these sales being in Kenya, Tanzania, Uganda and Rwanda. Many other PAYG solar companies are springing up across the continent – offering various solar home systems – such as Off Grid Electric, which is active in Tanzania, Rwanda and Côte d'Ivoire, and Azuri Technologies, which is present in 11 countries across Sub-Saharan Africa.

#### SOLAR REVOLUTION

"A solar revolution is coming to Africa that is comparable in scale and importance with the rapid surge in mobile phone use on the continent two decades ago," said Adnan Amin, Director-General of The International Renewable Energy Agency (IRENA), in a recent interview with the Thomson Reuters Foundation.

Utilising mobile money is extremely critical for these solar companies, because it allows them to track customer behaviour accurately, communicate directly via SMS with

customers about their payment, and remotely lock a device in the case of non-payment. And while, historically, mobile money users have been concentrated in East Africa, the GSM Association's latest data shows that user growth is now being driven by other markets – particularly West Africa – while the number of registered mobile money accounts has reached 280 million across Sub-Saharan Africa.

#### A GLOWING ECONOMY

While solar home systems can supply a few lights, a mobile-phone charger and a power-efficient TV, they can't

#### IRENA

**The International Renewable Energy Agency (IRENA) is an intergovernmental organisation that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international co-operation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy, in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity."**

Source: [irena.org](http://irena.org)

*'Africa's vast solar potential presents a huge opportunity for people to engage in a range of economic activities'*

– Adnan Amin –  
Director-General of IRENA

produce enough current for energy-sapping appliances such as fridges. For this reason, solar companies like Powerhive in Kenya and Black Star Energy in Ghana, take a different approach by building solar micro-grids that not only provide enough power for a fridge, but can even electrify a whole village. "Our approach is based on the idea that economic development depends on access to enough electricity to power productive activities, not merely lights and mobile-phone chargers," says Rik Wuts, co-founder of Powerhive. "So we provide enough capacity for homes, businesses, health clinics and schools to be productive at all times, and for as long as they need during any given day." The technology venture uses smart metres linked to a cloud-based server, which enables customers to pre-pay for electricity using M-Pesa, while allowing Powerhive to remotely monitor performance, consumption and cash flows.

#### ENABLING THE ENTREPRENEUR

Powerhive became the first private utility in Kenya's history to be licensed to sell electricity to the public. It now operates six micro-grids in Kisii, western Kenya, providing renewable energy to around 4,000 households and small businesses. "Thanks to this electricity, I now have light in my house, but I've also been able to start several small businesses, including a barber shop and a small kiosk where I sell items for the home and offer phone charging to customers," says Dismas Mosongo, while cutting hair in his rudimentary wooden salon. This farmer doubled his income thanks to the extra economic activities that were made possible by access to electricity.

#### PERSONAL FARMS

Powerhive has started a chicken hatchery and training programme pilot, which teaches customers to breed their own chickens using light bulbs and heat lamps to speed up the growth. This provider of off-grid utility solutions plans to expand to an additional 120 villages, resulting in a total of 100,000 household and business connections within a three-year period.

"Africa's vast solar potential presents a huge opportunity for people to engage in a range of economic activities, including all kinds of small businesses, irrigation and agro-processing," says Nairobi-born Amin, who believes that this will create jobs for millions of people across the continent. "It has never been more possible and less expensive for Africa to realise its solar potential."

**30%**

**of all Kenyans have access to electricity**

**15%**

**of annual sales are lost by businesses in Tanzania due to power outages**

**11 million**

**people in Sub-Saharan Africa use solar lighting. This might grow to 500 million by 2030**

**US\$40**

**was the price of a single compact fluorescent bulb and a lead-acid battery in 2009; now, using LED bulbs and lithium-ion batteries, you can get four times as much light for the same price**

**US\$56**

**is what it costs most African households – that are running solar systems – for a year of electricity**



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