

Country briefing



Accelerating access to electricity in Africa with off-grid solar

Off-grid solar country briefing: Tanzania

This country briefing is one of 13 prepared as part of a background study for the Energy Africa campaign launched by the Department for International Development (DFID) on 22 October 2015. The study was undertaken by the Overseas Development Institute (ODI), the Global Off-Grid Lighting Association (GOGLA) with SolarAid, and Practical Action.

The analysis and conclusions in this briefing, and other reports from study, are those of the authors and do not necessarily reflect the views of their organisations, ODI, GOGLA, Practical Action and SolarAid, nor those of DFID.

All project reports are available at: www.odi.org/publications/10200-accelerating-access-electricity-off-grid-solar



Background

Tanzania has a population of about 53.5 million.¹ This is expected to grow by 30 million people, to 83 million, by 2030.² In 2012, only 24% of the population had access to electricity. In urban areas 71% had access, while in rural areas the proportion was only 7%.³ Recognising the importance of energy for continued economic advancement, the Tanzanian government worked with NORAD to set out a National Electrification Program Prospectus, detailing plans to increase electrification rates to 50% by 2020 and 75% by 2035.⁴

The off-grid sector already provides 2MW of power, largely solar, to around 15% of the population, according to interviewees. One also noted that there is emerging evidence of a 'clean energy ladder' where those who purchase small solar products begin to add additional purchases or buy larger systems. The Tanzanian pico-solar market has grown rapidly and is one of the largest in Africa with several mature players, such as Off Grid: Electric, Mobisol, d.light and Greenlight Planet. This rapid growth has led to a huge influx of low quality products entering the market. Addressing this product quality challenge, enabling capital finance and raising awareness of solar in remote regions and with local government leaders, could accelerate the off-grid market and ensure that solar home systems become a more fundamental part of Tanzania's electrification plans.

Policy environment

Policy around off-grid energy is still under development. The foundations for the National Electrification Program Prospectus have been put in place, including the establishment of the Rural Energy Agency, the creation of a Rural Energy Fund and by establishing an enabling environment for private enterprises. In respect of off-grid solar, the Prospectus highlights the potential of solar home systems but does not estimate the number of households which might be electrified in this way

due to lack of available data. It also notes that the government aims to "mainly electrify customers by connection to the main grid," in particular, those settlements "within 10 km of the main grid and having at least 500 inhabitants".⁵ The government's focus on larger energy solutions to energy access issues was also noted by interviewees.

Nevertheless, several steps have been taken which support the sector. VAT and tariff exemptions have been applied to imports of small solar products. The previous Tanzanian President lent his voice to Off Grid: Electric's high profile plans to create 1 million solar homes,⁶ and two projects to promote and raise awareness have been implemented. Moreover, the National Electrification Program Prospectus notes that, even if all of the interventions outlined in it are realised, it will not meet targets unless "access to electricity" is re-defined. This would need to be extended to encompass those who do not have electricity within their own home (i.e. by including those who have access to central services, such as a dispensary with a fridge). This suggests that solar home systems could fill significant gaps within the programme.

Interviewees advised that greater dialogue between the public and private sector, to increase understanding of the potential and needs of the off-grid industry, would be a valuable way to drive practical policy design and implementation. Interviewees also indicated that more awareness of the development potential of solar home systems and lights at the district council level could drive engagement with the sector. One stakeholder advised that the Tanzanian Renewable Energy Association (TAREA) has begun a programme to train district councillors on the benefits of solar energy, and the importance of quality, in order to increase local government support. They have worked with officials in six regions but have not yet found funds to engage in other districts.

Access to finance for the private sector

Finding locally available financing at competitive rates is a significant challenge. Interest rates from a commercial bank are around 16-18% at good rate, and are more likely to be around 20-21%.

¹ United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision.

² UN World Population Division (2015) Available from: <http://esa.un.org/unpd/wpp/DataQuery/>

³ IEA World Energy Outlook (2014). The SE4All Global Tracking Framework (2015) estimated that only 15% of the total population had access to electricity in 2012.

⁴ United Republic of Tanzania (2014) *National Electrification Programme Prospectus* Available from: <http://bit.ly/1kx305k>

⁵ United Republic of Tanzania (2014) *National Electrification Programme Prospectus* Available from: <http://bit.ly/1kx305k>

⁶ Cleantechnica (2015) *1 Million Solar Homes Project Announced by President of Tanzania* Available from: <http://bit.ly/1LcWJnz>

Interviewees advised that the government is creating grants for off-grid energy, but these seem to be targeted at mini-grid developers. Therefore, while it is possible to get finance, this is often prohibitively expensive.

Currency stability also has a significant influence on cash flow as stocks have to be purchased in US dollars but sold in Shillings. Fluctuations in exchange rates can quickly undermine small operators. One stakeholder advised that there is a “missing middle” in Tanzania when it comes to capital finance and that the market could be significantly accelerated through support for viable credit lines, overdraft facilities and de-risking instruments. A stakeholder from SNV advised that, although they had seen success with results-based financing schemes and early funding mechanisms, funds to mitigate the impact of rapid market change are also needed, as “if you don’t [have such mechanisms] you can have all the RBF in the world but no one will be there to make the most of it.”

Import of solar household related equipment and fiscal barriers

Solar products are largely exempt from VAT and duties. These fiscal incentives were seen by interviewees as a key reason for the growth of the off-grid sector in Tanzania. Indeed, the exemptions seen across East African countries were seen as central to bringing solar into the region. However, batteries are not exempted from VAT, which causes particular issues for operators selling solar home systems where component parts of the product are separate.

Consumer protection and quality assurance

Low quality products entering the Tanzanian market have become a critical problem. Interviewees estimated that around 60-75% of the pico-solar products available are of poor quality. The Regulator is aware of the problem, leading the Tanzania Bureau of Standards to undertake a market surveillance exercise. Of 17 shops in Dar Es Salaam they visited, all were found to be selling substandard products. One interviewee advised that, once products reach a certain scale, they may also be imitated. They advised that they had seen seven different poor quality copies of the d.light S2 alone. In cases where operators selling good quality products have not been able to meet market

demand, a supply of cheaper, low quality products have been able to proliferate.

Although there are regulations around standards for solar energy in Tanzania, as well as pre-verification of shipments, these are only applicable to traditional home solar arrays and often prove ineffective. In some cases, shipments of good quality products have been stopped while low quality products have been able to enter the country. One interviewee advised that the government is likely to move towards setting standards on pico-products following the Lighting Global standard. However, concerns were raised that local enforcement of these regulations might prove challenging for customs officials. Various suggestions were made as to how the problem might be addressed on both the demand and supply side.

On the supply side, there is a good framework in place including PIVO, a pre-shipment inspection where a customs official verifies products at the point of origin before a container is shipped to Dar Es Salaam. Even though the regulator has agents overseas verifying the quality of goods, poor products are still being imported. Tighter regulatory controls could help to limit the supply of low quality products. Supply side issues could also be addressed through increased financial support for those organisations providing good quality products and services which are being undercut by operators selling poor quality products with no warranty or after sales service.

On the demand side, the Tanzania Renewable Energy Association (TAREA) has run campaigns around quality awareness in Mwanza, Morogoro, Dar Es Salaam and Pwani, and is working with the Tanzanian Bureau of Standards to educate people through radio, live talks and roadshows. These activities showcase how customers can recognise low-quality panels, explain the importance of a warranty and provide more specific specifications on technology. More of these campaigns and a stronger focus on quality in other awareness raising activities could help protect consumers from purchasing low quality products. Unless well-designed and monitored, however, such campaigns could also have a negative impact on demand for high quality products.

Consumer awareness

Interviewees advised that awareness of solar lights and home systems in the Northern Crescent and Coastal Areas is very high as a lot of programme work has taken place in this region. In the Lake Zone, however, there is a lot of promotion but not much investment in firms so that they can provide long-term supply. Consumers are therefore very aware of solar products but may not know where to get them. From the centre of the country and southwards the level of awareness is low.

There is an opportunity to address the issue of quality, as well as raising awareness in new areas, through well-designed educational campaigns. District Councils in Tanzania are also big consumers of renewable technologies and have a significant level of influence on local development planning. More community leaders could be trained on the benefits of solar energy, for local planning as well as to benefit constituents, and engaged with education plans.

Providing a level playing field

Two-thirds of households use kerosene for lighting, which is not directly subsidised but has at times had a lower excise duty than other petroleum products. It has also been VAT exempt. In 2011 the duty differential was all but eliminated, removing the indirect subsidy.⁷ Interviewees saw the removal of the kerosene subsidy as one of the critical success factors for the growth of the Tanzanian solar market. Although there is now a subsidy for people to connect to the grid as this expands, the number of connections made is still low. In some areas subsidies can reduce a connection charge to as low as \$ 20, though this is prohibitively expensive for many families and additional upfront payments are also required to cover the cost of hardware.

Concerns were also raised about large giveaways of solar products becoming attractive to governments and donors (a response to the concern about giveaways as part of a large infrastructure deal in neighbouring Kenya). Interviewees suggested that a considered view should be taken by government and donors on the systemic impact of giveaways. One also suggested that the private sector should work more closely with civil society as, on a smaller scale, giveaways by NGOs and church charities have

already created some price instability in the country.

Availability of consumer financing

In Tanzania, traditional microfinance loans are quite localised. In rural areas, small localised credit facilities can be used to provide finance but as these microfinance institutions need to buy their own capital locally at high interest rates, adding operational costs and default risk, this sets interest rates at between 40% and 100% per annum.

To help address this, pay-as-you-go financing schemes are now becoming available for solar home systems, including mobile-enabled pay-as-you-go. About 32 million people in Tanzania have mobile phones, though some areas of the country do not have a strong mobile phone network. According to interviewees, solar pay-as-you-go companies are lobbying mobile phone companies to improve connectivity in areas where this is impeding operations.

One interviewee advised that generic business models may not work in agriculture-based environments where most people do not have a steady income – 70% of the population in Tanzania do not receive any income for a quarter of the year. Pay-as-you-go technologies and business models are very capital intensive and creating finance mechanisms which integrate volatility in customer income is even more of a challenge. More mechanisms which provide finance for companies that offer pay-as-you-go customer finance would ultimately help affordability. Other solutions for those who cannot afford pay-as-you-go home systems are also needed, as 28% of the population live in extreme poverty.⁸

Level of local skills

While the level of literacy is relatively high at 67.8%,⁹ one interviewee advised that organisations have trouble finding people with finance and marketing skills, the “guts” of the administration. People with practical skills sets can, and have, been trained in solar technology, but keeping these technicians engaged with the sector was also

⁸ World Bank (2011) Available from: <http://data.worldbank.org/country/tanzania>

⁹ UNDP (2013) *Human Development Reports* Available from: <http://bit.ly/1Q7pzLe>

⁷ https://energypedia.info/wiki/Fuel_Prices_Tanzania

highlighted as a challenge. Many organisations are too small to keep technicians in full-time employment. Given the increase in pay-as-you-go technologies, a skills gap in IT might also become a constraint.

Although TAREA has trained some individuals for 1-2 weeks in some solar technologies, there is no formal vocational training of young people for renewable jobs in the country. More vocational training, and training in key organisational skills, are needed to provide strong foundations for the sector.

Summary and recommendations

Tanzania's explosive off-grid energy success has laid strong foundations for the sector. It has also led to the problem of low quality and fake goods proliferating in the market. More work on both the supply and demand side, such as closer monitoring of pre-verified goods entering the market and well-designed education campaigns, could help address this. Additionally, more finance for high quality product and service providers could both accelerate the growth of the market and enable higher quality players to regain market share from those selling poor quality.

Area	Situation	Opportunities
Policy Framework	Strong foundations are in place with specific plans for rural areas. These do not include off-grid targets, and most of the focus is on on-grid and mini-grids solutions which, even before anticipated population growth, will not reach all un-electrified Tanzanians	As on-grid and mini-grids cannot meet electrification targets to achieve 100% energy access, off-grid solutions will be needed. Integration of off-grid targets into Energy Policy will help drive greater focus on, and financial support for, the sector.
Access to Finance	Although relatively well established, the market is still undercapitalised and vulnerable to exchange rate volatility. Finance for established players is slowly beginning to flow, but there is a "missing middle" in available support.	Viable credit lines and overdraft facilities will help provide security and flexibility to small or early stage organisations. Enabling finance and de-risking mechanisms are needed for larger players.
Fiscal Barriers	Quality solar products are largely exempt from VAT and tariffs, but batteries are not.	Extending VAT exemptions for solar batteries would help support SHS suppliers.
Consumer Protection and Quality Assurance	A huge challenge has been created by a large influx of low quality and fake solar products into the market.	Supply side: support government efforts to monitor customs verification and increase capital finance for those supplying high quality products. Demand side: well-designed programmes for consumer education on quality with close monitoring of impacts to ensure efforts do not reduce demand for high quality products.
Consumer Awareness	Consumer awareness in the Northern Crescent and Coastal areas is very high. There is low awareness of solar products in some other areas of the country.	Undertake awareness campaigns - i.e. via schools and local networks in areas not yet reached, ensure these integrate awareness around quality. Make sure campaigns are swiftly followed by supply of good quality solar products to limit the market share taken by those selling low quality products.
Providing a Level Playing Field	Kerosene is not directly subsidised. Subsidisation of grid access and giveaways may affect the solar market.	More communication between private and public sector stakeholders will raise awareness of the impacts of subsidies and giveaways on market dynamics.
Consumer Financing	Pay-as-you-go financing for solar home systems is now common in many regions.	Increased finance for those selling products to low-income consumers as well as capital for PAYG operators will help meet consumer financing needs.
Level of Local Skills	There is a relatively high level of human capital and some training has been undertaken by TAREA, as well training by market actors.	More training is needed in all areas, from technical to soft skills. TAREA provide a good body through which to extend and enhance sector training programmes.



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