

Rural household lighting markets: Driving the energy ‘trilemma’ to an end

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Picture 1: Rural retailers of mobile phone airtime selling PicoPV within SNV's programme in Benin (Source: SNV)

Energy access has gained importance in the global development agenda, particularly in sub-Saharan Africa. Several delivery models have been and continue to be deployed by energy practitioners to address this issue. One such model looks at market-based solutions to reach households at the Bottom of the Pyramid (BoP) with small solar systems (PicoPV). However, in order for families to be able to access energy services, the affordability aspect must be taken into consideration across the entire distribution chain. Despite efforts towards this goal having been undertaken throughout sub-Saharan Africa, there is still a lot more to be done to achieve not only mere energy access but energy security. Concerns remain about the sustainability of delivery models and the chances of survival beyond a project's life. The Netherlands Development Organisation (SNV) has developed PicoPV distribution models which, by forming links between businesses and promoting mutually beneficial relations, facilitate flexible payment methods for end-users and therefore enable financing along the value chain, ultimately allowing people to access affordable products.

Introduction

Africa has experienced explosive growth in the off-grid solar lighting sector with between 100-300% growth in sales at company level since 2010. Despite this impressive performance, the lighting situation in Africa remains almost as immediate and urgent as it was few years ago. In fact, by

2030, Africa's un-electrified population is projected to grow to almost 700 million people (Lighting Africa Report, 2013).

Key to this issue are three elements that sit at the nexus of rural Africa's top priorities: energy access, its sustainability, and its affordability. The Netherlands Development Organisation (SNV) has developed interventions to appropriately link up energy and business, and SNV

experience since 2013 demonstrates some key lessons to address this 'trilemma' and achieve sustainability. In 2014, SNV operated 13 solar projects globally with more than 60 000 PicoPV products having been disseminated. Through the following programmes, around 200 000 people have improved their living conditions:

Picture 2, 3 and 4: A 'bibliomoto' used in a distribution channel to disseminate PicoPV items under a SNV initiative in Burkina Faso
(Source: SNV)

- Burkina Faso, Uganda and Democratic Republic of Congo: PicoPV Four Africa Programme
- Niger, Benin, Mali and Ghana: Solar Lamp Value Chain Development, Power out of Poverty Partnership, Energie solaire, and the Solar Lantern Saving scheme respectively
- Kenya: the Solar PicoPV Energising Development Programme
- Zimbabwe: Rural Solar Market Development
- Uganda, Rwanda and Tanzania: The Integrated Renewable Energy Services (IRES) Programme
- Tanzania: Result Based Financing (RBF) for PicoPV

The common aims amongst these projects is to catalyse awareness, to create relevant linkages and to build up robust distribution channels from manufacturers down to Bottom of the Pyramid (BoP) users with comprehensive financial mechanisms. While the approach is similar for all countries, the solutions are contextualised to the local market contexts. SNV's added-value is the focus on and skills in contextualising the interventions to reach last mile customers with affordable quality products without distorting the market.

In Burkina Faso, SNV has supported (creating connections with importers and training) local NGOs to incorporate PicoPV items into their services based on complementary missions. For example, if the core business of a NGO is education, people are encouraged to continue to read and lectures are provided to remote rural areas with the 'bibliomoto' - a small mobile library selling and lending books (Picture 2, 3 and 4). By adding the PicoPV to the current commercial activity and channels, solar products are effectively reaching people who require light to reach these education goals. In addition, the income generated by these retailers is increased.

The Power out of Poverty Partnership project in Benin aligns PicoPV distribution to one of the most outreaching technology supply chains in Africa, those of mobile telephone products. SNV and MTN, a local telephone company, have strengthened the company's pre-paid recharge card



Picture 5: A rent-to-own scheme experience by SNV in rural Cameroon (Source: SNV)



distribution network with the skills, finance and tools to run a profitable business in rural villages by selling mobile phone charging services, PicoPV and MTN products (Picture 1). The solar micro-entrepreneurs operate a solar powered cart, which is a highly visible example at village level of solar power at work. The mobile kiosk provides rural people the chance to interact first-hand with solar power to get their phone recharged and, at the same time, the opportunity to purchase a lantern. Acknowledging the potential of this initiative, MTN invested in the manufacturing of the carts for their MTN agents and SNV provided capacity building with regards to quality criteria and after-sales services.

In Zimbabwe, a partnership with the International Labour Office enabled SNV to unlock the potential of youth enterprises to supply the rural market. Combined with group-guarantees, provided through the agro-retailers network, the partnership was able to supply over 25 000 products to rural markets in 2014.

Although each intervention was tailored to specific market conditions, they all created connections to existing efficient rural product distribution networks, end-user appropriate payment mechanisms and chain financing. This article does not describe a one-size-fits-all business model but rather emphasises the strategic components that can be considered to design viable models.

Component 1: Building the distribution channel for access

SNV have been working in the development sector for more than four decades, in over 40 countries and in various sectors including agriculture, WASH and renewable energy. Regardless of the sector, 'inclusive business' has always been the corner stone of all interventions. PicoPV distribution strategies, that are currently being used, utilise two channels built several years ago by SNV from agriculture and WASH sectors as well as new ones. While using pre-existing channels is a natural approach, setting up new ones out of nothing is more challenging. In order to

build new channels, SNV has conducted fairs, workshops, road-shows and carried out studies to further inform and better direct its actions (SNV, 2011-2014). These activities were conducted by SNV to create strong linkages on a business-to-business basis. As a consequence, suppliers struggling to distribute their products have identified retailers and end-users have gained awareness about quality products and where to find them. The Switch to Clean Energy campaign in Uganda has reached over 19 000 people including end-users, retailers, and potential distributors. Similarly SNV in Burkina Faso helped Total reach the last mile. Total's distribution strategy was based on their fuel station network, but after a few months the product sales dropped due to market saturation as many potential clients, usually going to fuel-up, had already purchased at least one lantern and its network did not reach the BoP at the last mile.

To address this problem, SNV set up a first line of facilitators including local NGOs, village associations and rural entrepreneurs that filled the distribution gap between the gas stations and the end-users at the last mile. As a consequence, sales for this specific intervention rose by 20% in rural areas. Moreover, trust with rural enterprises was established and, for the first time, stock on consignment was granted.

Component 2: Appropriate finance for affordability

In rural markets, the key player is the rural distributor who must be able to have enough stock to sell to clients in a way that does not disrupt his/her business. Therefore, to have and keep the flow of stock going, access to finance is needed upstream, by rural retailers to stock their

goods, and downstream, by end-users to purchase with a payment method that matches their usual expenditure patterns.

Looking in more detail into the upstream and downstream flow around rural retailers, it is clear that upfront finance to purchase goods remains among the top issues in developing rural markets. The reality on the ground is that banks and often even micro-finance institutions, are not prepared to provide loans directly. Therefore, dedicated efforts from organisations like SNV are required.

As another example, in Niger, SNV's successful interventions have allowed retailers to access in-kind loans. A micro-finance institution (MFI) used its capital to invest when entering the market of solar products as an importer. This MFI has an active presence in around 3000 villages across the country and uses the base of its micro-finance clients to sell solar products. The MFI keeps full ownership of the stock until it is paid back and maintains the right to collect the items back, selling them directly within its network. In this case, SNV's role has been that of advocating for tax exemption at the government level (SNV Niger, 2014), elaborating a business case to convince the MFI to sell the items within its network, and negotiating the terms of loans to potential distributors.

In another case, SNV has used Result Based Finance (RBF) schemes to provide an incentive for companies to move into specific otherwise less interesting market segments. An incentive is provided to solar companies upon the verified sales of certified pico-solar products to clients in the Lake Zone, in the form of a product bonus to retailers or capital bonus to suppliers (based on sales volumes).

Neither of these RBF incentives payments can be earned without proof of sale and, unlike loans that give a fixed one-time payment bearing interest,

it is therefore linked to performance. Moreover, suppliers and retailers are incentivised to support each other because products' sales grant financial incentives to both parties, and if one party fails to deliver, both will bear the consequences. In order to ensure sufficient understanding around the use of RBF funds as a post-finance tool for distribution chain development, SNV supports suppliers that were admitted to the fund with capacity building services around pre- and post-RBF planning.

One clear characteristic of BoP markets is that clients want to buy items the way they've always done it. In many cases, this can be using pay-as-you-go (PAYG) systems. The primary way of mimicking this payment system is rent-to-own schemes (Picture 5) or leasing schemes whereby end-users pay on a daily, weekly, or monthly basis, a fee to use the product until the product has been fully repaid. A second method is to link the PicoPV product to a PAYG system where end-users pay an initial modest deposit and continue to purchase energy units, by scratch card or mobile payment, until the item is fully repaid. Given the abundance of mobile payments systems in Africa (Mc Kinsey, 2014) there are good reasons to state that the PAYG system is a viable match with expenditure patterns of rural populations.

In Kenya, SNV is piloting a project focusing on PAYG systems integrated at the manufacturer's end for Philips PicoPV products and stoves. PAYG technology allows consumers to purchase PAYG-ready products over time, in affordable increments, just as they purchase cellular airtime or kerosene fuel in a 'business as usual' scenario.

Component 3: Undertake a rehearsal for sustainability

Every organisation is, or should be, concerned with the sustainability of its initiatives when programmes come to an end. In a sense, what is being advocated here, is the idea of using a proper exit strategy for involved players.

To illustrate this, it is useful to look at the PicoPV RBF programme developed by SNV in Tanzania. The programme allocates some incentives, that are regressive over time, to well defined players in the value chain. This encourages them to operate in areas where they would otherwise have no plans of expansion in the near future. From the earliest stage of designing the scheme, all stakeholders, such as financial institution and importers amongst others, are well informed of the process and the timeline before joining the programme. The value of the RBF incentive applied to each unit of pico-solar is determined annually by SNV based on the performance of each product (in terms of brightness and run time duration) with an annual product incentive cap that limits over-subsidisation. As the market develops and economies of scale are achieved, the annual product incentive value decreases by 25% per annum. This intervention is on-going and has demonstrated very good results so far, with importers opening permanent offices with permanent jobs in the targeted region. On the other side, the involved finance institution also acquires the practice of mastering risk management in PicoPV markets and this allows it to continue when the SNV programme comes to an end. The intention is to have all these players endorse the activity and run it as an ordinary business.

Conclusion

Having analysed the components that must all be properly addressed in designing a viable model for lighting markets, it has been illustrated that a good combination of strategies is far more effective than each of these issues addressed separately. In such, addressing the 'trilemma'-energy access, its affordability, and its sustainability- encompasses at least three well-tailored responses.

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