

Lessons learned

Access to finance for renewable energy technologies

Inclusive rural financial services



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These notes are “living” documents and will be updated periodically based on new experiences and feedback. If you have any comments or suggestions, please contact the originators.

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List of acronyms

BTL – below the line

FSP – financial services provider

IFAD – International Fund for Agricultural Development

MFI – microfinance institution

MGA – Malagasy Ariary

MSME – micro, small and medium enterprise

NGO – non-governmental organization

PAMIGA – Participatory Microfinance Group for Africa

PAYG – pay-as-you-go

RE – renewable energy

RENACA – Réseau National des Caisses villageoises d'Épargne et de Crédit Autogérées

RET – renewable energy technology

SACCO – savings and credit cooperative

SHS – solar home system

SMS – short message service (or text message)

TSP – technical solution provider

USAID – United States Agency for International Development

WPS – Wakenya Pamoja SACCO

Introduction

Access to affordable, reliable and sustainable energy is often associated with economic development and considered vital to alleviating extreme poverty (World Bank, 2018). Yet access to clean sources of energy is still a challenge for many smallholder farmers, their families and rural entrepreneurs. In recent years, great advances in renewable energy technologies (RETs) have started to make more tangible the achievement of Sustainable Development Goal 7: “Ensure access to affordable, reliable, sustainable and modern energy for all”.

Beyond technology development, the current challenge is to make these technologies accessible to rural populations. As RETs require some upfront investment, access to finance is a key component to facilitating their wider adoption. Recently, donors and financial services providers (FSPs) have increasingly invested in demonstration projects to facilitate access to financial services for RETs.

The purpose of this note is to: (1) share what has been learned worldwide in inclusive rural finance projects focused on renewable energy (RE) and highlight implications for rural areas; and (2) synthesize the lessons learned in the innovation and development of access to finance for RETs, focusing on how these are meeting the needs of smallholder households and how these households can access financial services to finance RETs.

This note focuses on end-user finance for individual/stand-alone RETs for rural households, smallholder farmers and rural micro, small and medium enterprises; RETs for communities, which require very different types of financial instrument or scheme, are not addressed here. The authors offer examples of smallholder-specific financial solutions as well as mainstream ones – in each case highlighting the implications for smallholder farmers and their households. The note also elaborates on the opportunities and challenges that FSPs face when providing finance for access to RETs.

Building on these lessons learned, the final section outlines strategic recommendations that IFAD country programme managers, Project Design Teams and implementing partners can carry out to promote access to finance for RETs. The lessons learned discussed in this note complement the guidance on design and implementation presented in the How To Do Note that is part of the IFAD Toolkit for Access to Finance for Renewable Energy Technologies.

Context and challenges

Key issues

Today, an estimated 1.2 billion people (around 16 per cent of the global population) do not have access to electricity, and over 2.7 billion people (38 per cent of the global population) still rely on the traditional use of solid biomass for cooking (IEA, 2016). Most of them are concentrated in sub-Saharan Africa and developing Asia, and in rural areas. Owing to a lack of alternatives, these poor rural households still rely on kerosene-based solutions, candles or flashlights to light their house. However, these energy sources are costly, unreliable and harmful to health. Around 4.3 million deaths each year are due to illnesses attributable to the inefficient use of solid fuels for cooking (WHO, 2016). The burden is particularly heavy on women, who spend the most time indoors taking care of household chores.

The lack of access to reliable sources of energy hinders the productivity and development potential of micro, small and medium enterprises in rural areas by making the use of electrical machines too expensive or impossible. A lack of access to affordable energy also prevents many smallholder farmers from developing irrigation systems that could improve their yields and increase the area of their land that is cultivated.

RET solutions for these target groups do exist: solar lanterns, solar photovoltaic systems, solar water heaters, solar dryers, solar water pumps, biogas digesters, wind turbines and micro-hydro systems can all address some of the most acute energy needs of rural populations. Such RETs usually have a positive return on investment, as they replace more expensive, traditional sources of energy and, if used productively, can generate additional sources of revenue. However, the upfront costs involved remain a key issue for most rural households, smallholder farmers and entrepreneurs. Could access to finance for RETs help them to overcome this financial barrier and expand access to RE in rural areas?

Opportunities

Benefits for rural households, smallholder farmers and rural businesses

Financial services to facilitate investments in RETs could bring significant benefits. RETs can help rural households reduce their energy expenditure and improve their living conditions (e.g. less indoor air pollution, better quality lighting). They can enable smallholder farmers to increase the area of their land that is irrigated, increase their yields, diversify their sources of revenue (e.g. different crops, grain and fruit drying, cooling, storage, processing activities) and, as a result, increase their revenues and improve their resilience to climate change and shocks.

Furthermore, RE solutions can foster the creation and development of rural businesses, enabling them to reduce their energy expenses and improve their productivity. RETs also improve access to information and communication (e.g. through mobile phone charging, radio, TV), opening up new opportunities for rural populations in terms of access to markets and education, among other benefits. In addition to these economic and social benefits, RETs provide access to energy while reducing pressure on natural resources and reducing greenhouse gas emissions.

Benefits for entities providing RE finance

There are two main categories of entity providing end-user financial solutions for RETs:

1. FSPs, as part of a diversified offer of financial products: mainly through loan products (e.g. group or individual loans, stand-alone or bundled loans), but possibly through programmed savings accounts as well.
2. Technical solution providers (TSPs) that distribute RETs and offer vendor finance solutions to their clients: for instance through pay-as-you-go (PAYG) technology that allows end-users to digitally pay for RE in small instalments,¹ or through the commercialization of energy as a service (e.g. battery charging, renting solar lanterns, renewable energy service companies).²

For FSPs, engaging in RE financing could bring clear strategic and financial benefits, such as differentiating themselves from competitors, attracting new clients and retaining existing ones, diversifying their offers and portfolio, building a positive image as a socially and environmentally responsible institution, or attracting new sources of funding.³ FSPs with a social mission will also be driven by the positive economic, social and environmental impacts that can be expected from facilitating access to RE (Allet, 2014).

For TSPs commercializing RETs, developing their own financing solutions could help them to significantly expand their outreach to lower-income customers and those in rural areas, differentiate from competitors, and avoid a reliance on external partners such as FSPs, among other benefits.

¹ After paying a down payment, the customer gets its solar solution installed. To be able to use the solar solution, the customer needs to make regular payments, either through mobile money or through agents. For each payment, the technology gets unlocked (either digitally or by entering a code received by text message) for a certain period of time or for a certain power consumption. When payments are not made, the system gets locked and the customer cannot use it until the next payment is done.

² Please refer to the How To Do Note for more details about the various financial solutions.

³ This is similar to findings by Allderice and Rogers, 2000; Allet, 2014; and Levai, Rippey and Rhyne, 2011.

Challenges

Despite these opportunities, significant challenges continue to constrain the expansion of RE finance:

- **Dependence on the RET supply chain.** Financing RE solutions implies that adapted, quality RE solutions and all related customer services are available on the local market. Even though the RE sector has been developing rapidly in recent decades, the supply chain does not have the same level of maturity in all countries and may still present significant weaknesses. In particular, existing RETs do not yet cover all types of need (especially productive energy needs) and are not distributed everywhere. Furthermore, in most countries, distributors of RETs remain based in urban and peri-urban areas and fail to provide adequate customer services to rural areas (e.g. delivery, installation, maintenance).
- **RETs as “push” products.** Even if rural people have already heard of some RETs, misunderstandings and misconceptions can persist regarding these technologies, creating false expectations or low interest. A lack of information on RETs (e.g. their functioning, uses, capacities, limitations, maintenance) is a key barrier to their adoption within rural communities. RETs therefore remain “push” products that require significant promotion to overcome the low awareness and risk aversion of rural populations.
- **Competition by low-quality, cheap solutions.** In places where RETs can be found easily on local markets or in secondary towns, people are confronted with problems of quality linked to “cheap” solutions: for example those that are counterfeit, of low quality, or have no warranty. Bad experiences with low-quality solutions can generate significant distrust in RETs in some countries.
- **Inadequate policy frameworks.** Many countries still heavily subsidize fossil fuels, distorting the market for RET solution providers. Some countries also lack conducive policies, such as net metering, which would make investment in RETs more compelling to grid-connected rural communities.
- **High-risk perceptions among FSPs.** Because of all challenges mentioned, the risk that customers are unhappy with their RE equipment appears high. This can translate into a direct credit and/or reputational risk for FSPs. As a result, FSPs often remain reluctant to engage in the RE sector.
- **Limited capacity of RE companies to provide payment solutions themselves.** Developing vendor finance solutions, such as PAYG, requires RE companies to build internal competences related to credit management, and initiate a change of mindset to look not only at sales volumes but also at portfolio quality. Furthermore, selling RETs on PAYG or as a service (e.g. renting, battery charging, renewable energy service companies) also implies a need to pre-finance RE products. RE companies may not always have the resources needed to engage in vendor finance or PAYG in an adequate way. When they do, their development is often constrained by limited pre-financing capacities.
- **Limited capacity of FSPs to develop innovative financial products.** Entering into energy financing requires FSPs to develop a minimum level of internal skills related to RETs. It implies a need to engage resources, build partnerships and ensure coordination with TSPs. It also requires having sufficient funding to finance a new type of portfolio. Many FSPs are not always in a position to develop such innovative financial products.

Lessons learned

Experimentation with access to finance for RE has resulted in significant lessons learned on what works and what does not work well. The lessons learned in this section are divided into two main categories: strengths and challenges.

Strengths

Field experiences are developing and contributing to the identification of good practices

A growing number of FSPs are engaging in RE financing. Even though there is no exhaustive record of the number of FSPs involved in RE finance, several studies show a positive trend. Schuite and Forcella (2015) identified that the number of FSPs that self-report to the MIX Market⁴ and provide “green” loans to their clients grew consistently from 2008: in 2014, 177 FSPs (out of 1,107) reported offering loans specifically linked to RE. This number is likely to be an underestimate: for Latin America alone, the Inter-American Development Bank (forthcoming) has identified 59 FSPs that provided energy-related loans during the 2012-2014 period, whereas only 35 FSPs reported doing so to the MIX (IDB). Furthermore, these data do not take into account the RE financial services that may be provided by actors other than FSPs.

A variety of models are being tested. One model that has been increasingly adopted is the “one-hand model”, in which a unique actor offers both the RETs and the financing solutions. This is the case for RE companies providing vendor finance solutions, such as PAYG (see Box 1), or selling energy as a service (see Box 2). It can also be adopted by FSPs that decide to set up their own subsidiary or sister company to handle RET distribution (see Box 3). Within each model, the exact modalities of implementation greatly differ from one project to the other. Such variety can be a great source of information on what works and what does not.

One of the most common models is the so-called “two-hand model”, in which a TSP and a FSP enter into a partnership and bring their respective competences to overcome the main barriers to access to RE. The TSP offers high-quality technologies, together with crucial customer services (e.g. delivery, installation, customer education, warranty, after-sales services), while the FSP facilitates access to its client base and offers financial products to facilitate investment in the RE solution (see Boxes 5-11 for examples of such models).

⁴ The MIX Market is a platform that provides instant access to data on the financial, operational and social performance of FSPs. See: www.themix.org.

Box 1. Pay-as-you-go: the case of Azuri Technologies, Rwanda

According to World Energy Outlook 2014, only 17 per cent of Rwanda's 10 million people have access to grid electricity. In rural areas, the electrification rate is 5 per cent, one of the lowest in sub-Saharan Africa. In May 2013, the company Azuri Technologies entered the Rwanda market with financial support from the United States Agency for International Development's (USAID) Development Innovation Ventures programme.

Azuri is headquartered in the United Kingdom and provides pay-as-you-go solar photovoltaic home lighting products to customers in off-grid areas of sub-Saharan Africa. One product provided by Azuri is the Indigo Duo, a power unit that uses a lithium iron phosphate battery, a 2.5-watt solar panel, two light points (using light-emitting diodes), and adapters to enable the user to charge a phone. Customers pay an installation fee of 6,600 Rwandan francs (RWF) (approximately US\$8.80, although currency degradation was a factor throughout the project) and the rest of the cost in regular 28-day instalments of RWF 3,500 (approximately US\$4.70).

Each Indigo Duo has a key pad, which is used to enter a code provided to customers when they make a payment. If payments are not made, the unit switches itself off. After an agreed payment period (21 instalments or 84 weeks), the customer can unlock and own the system by paying a single "unlock fee" of RWF 6,600.

Because of the limited development of mobile money services in Rwanda, the project initially utilized physical "top-up" cards – scratch cards available from the distributor's sales agents – as a mechanism for customer payment and validation. The customer purchases a top-up card, then scratches off the covering to reveal a code that is sent, along with the customer's unit serial number, via text message (SMS) to an in-country gateway. The gateway then contacts the Azuri server, which validates the numbers and generates a top-up code that is unique to the customer's system. This is sent back to the customer via SMS.

This payment validation method has the advantage that it is broadly similar to airtime purchase, so does not require extensive modification of customer behaviour, can be readily set up and requires limited in-country infrastructure to execute. This allows relatively rapid business development and does not tie the technology to a specific mobile service provider. As the product does not have an integrated mobile phone module, the build cost is lower. The deployment location is also less constrained, as customers do not need to have a mobile signal inside the house at the point where the unit is installed; they merely need to be able to send a text message once a week.

However, a number of disadvantages to a physical top-up card system exist and, in extreme situations, limit its effectiveness and long-term scalability. The major issue is the in-country logistics needed to manage and distribute physical top-up cards to the target rural communities. In Rwanda, which has a reasonably dispersed population in mountainous terrain, this can require considerable time and expense. Local agent networks also need to be sufficiently integrated into the distributor's organization to manage physical cash and flow this back to the distributor (and onwards to Azuri).

In the case of this project, there were significant challenges in ensuring the adequate and timely disbursement of funds from agents back to the distributor. While this can be mitigated by a debit approach (i.e. agents must first purchase the cards themselves), this introduces a cash-flow element as another layer in the distribution chain. These issues proved to be problematic for the local distribution partner, despite significant intervention attempts by the project partners, and hence led to an intermittent supply of top-up cards to agents and end-users in some areas.

Source: Adapted from Collings and Munyehirwe (2016).

Box 2. Energy as a service: the case of HERi Madagascar

HERi Madagascar is a social enterprise, established in 2011, that builds and manages a network of solar energy kiosks (centres for electricity production and the supply of energy services powered by solar photovoltaic panels) in the heart of remote, non-electrified villages. The HERi energy kiosks are franchised and managed by local businesswomen (women entrepreneurs). Currently, HERi Madagascar has 44 kiosks in seven regions.

There are three categories of service offered by each kiosk:

- **Charging** includes recharging lamps (which are only rechargeable at the kiosk), built-in battery radios (commonly referred to as “card radios”) and mobile phones.
- **Sales** covers a range of devices, such as autonomous solar lamps (often with a built-in panel), mobile phones, FM radios, solar home systems and energy-saving stoves.
- **Service provision** involves the provision of products and services selected by women entrepreneurs to develop commercial activities useful to the community. These include printing and copying services, refrigeration of fresh products (e.g. yoghurt, fruit juice) for community use or commercial use, and video projection for entertainment or dissemination of news programmes.

The rental and home delivery of rechargeable lamps are the commonest services available from every kiosk. These are also the priority services, since the prime objective of HERi is to increase access to clean, high-quality lighting for isolated rural populations. They benefit all consumers, including those who generally cannot afford modern solar products. The rental of rechargeable lamps is the main source of income for women entrepreneurs, providing approximately 75 per cent of revenue from the kiosks.

Two types of lamps are currently available for rent from the kiosk network, and home delivery is free for customers registered on a monthly subscription. The costs are shown in the table.

Models available through the HERi kiosks

Brand/ model	Lumens	Autonomy	Daily rental price	Monthly subscription	Aims to replace
FOSERA Scandle	160	8 hours	MGA 300 (€0.10)	MGA 7,500 (€2.30)	Candles
SUNKING Solo	50	12 hours	MGA 200 (€0.06)	MGA 4,500 (€1.40)	Kerosene

Given the important impact that seasonal incomes have on the cash flows of customers in rural areas, the development of tailored, easily comprehensible payment methods is key for the viability of energy service provision at the kiosks. The monthly subscription constrains households from “cashing out” the rental fee at the end of each month before renting the lamps for the following month. But people do not always have money at that time, which results in recurring collection problems for entrepreneurs.

To address this, HERi’s sales representatives and entrepreneurs set up various payment methods: subscriptions can be weekly, biweekly or monthly; consumers have the possibility of paying during the harvest season; and a prepayment model has been developed (i.e. the user pays at the start of the rental period rather than at the end). Prepayment involves specific cash flow management, limits the risk of outstanding payments and gives entrepreneurs a clearer overview of their monthly income. Flexibility remains the best way to deal with these challenges, which are typical of rural areas in Madagascar, and this has allowed HERi to report collection rates of approximately 85 per cent (payment of monthly subscriptions by lamp-rental customers).

Source: Adapted from Tavernier and Rakotoniaina (2016).

Note: MGA = Malagasy ariary.

Some success stories confirm the high potential of RE finance. Initiatives such as Grameen Shakti in Bangladesh (see Box 3) and M-KOPA Solar in East Africa have facilitated access to hundreds of thousands of RETs by providing adapted financial services for RE. They stand as exemplary projects, confirming the relevance of RE finance and the potential for its development.

Box 3. The success story of Grameen Shakti, Bangladesh

Inspired by the success and methodology of Grameen Bank, which provides microcredit to poor women, Grameen Shakti was established in 1996 to facilitate access to renewable energy solutions to rural populations in Bangladesh. Originally established as a not-for-profit, it is currently a social business and part of the Grameen family of companies.

At the heart of its core activities is the dissemination of renewable energy technologies in areas where there is no source of conventional electricity, or in rural areas where there is low electrification coverage. The company commercializes solar home systems (SHSs), small-scale biogas digesters, and improved cookstoves in particular.

Grameen Shakti has adopted a one-hand model, as the company commercializes renewable energy solutions, provides technical services (e.g. installation, after-sales support) and offers various instalment-based financing schemes (see table). It also offers free maintenance during the entire loan period and trains interested clients in maintenance and operation at no extra cost.

Available payment schemes for SHSs, 2015

Mode of Repayment	Down payment	Instalments	Service charge
Option 1	15%	36 months	6% (flat rate)
Option 2	25%	24 months	4% (flat rate)

The company was started with a US\$750,000 loan from the International Finance Corporation, as well as around US\$6 million in grants and loans from USAID, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, and other donors. Since 2003, it has been a key partner of the Infrastructure Development Company Limited solar home system programme, a national programme of the Government of Bangladesh that provides refinancing, grant support and technical assistance to selected partner organizations in charge of installing SHSs, extending loans to end-users and providing after-sales services.

Since then, the company has experienced impressive growth, achieving the following results:

Achievements as of June 2015

	In 2015	Since inception
No. of SHSs	65 311	1 615 446
No. of biogas plants	1 151	31 442
No. of improved cookstoves	43 295	932 200
No. of trained customers	n/a	1 001 784
No. of trained technicians	n/a	22 889

Since 2003, Grameen Shakti has reached self-sustainability and today receives more than 90 per cent of its revenues directly from sales. It reports that 97 per cent of SHS customers pay back their loans on time. The company now operates through 16 divisional offices, 165 regional offices, and 1,108 completely decentralized branch offices. It has a total of 10,507 employees, including engineers, sales agents, technicians and trainers.

Sources: Barua (2001); Grameen Shakti (2015); Sovacool and Drupady (2011).

Knowledge of good practices is growing. Publications from practitioners on lessons learned from RE finance projects are increasingly available, allowing others to build on previous experiences. A few toolkits, such as USAID's Clean Energy Lending Toolkit (2014), are freely available to stakeholders wanting to develop RE finance projects.

Access to RETs generates positive impacts

A growing body of literature demonstrates the positive changes that access to RE can bring to the lives and livelihoods of end-users. Even though the effects on poverty reduction, business development or education are still rather uncertain, according to scientific literature, many studies show that access to RE does generate some positive, local and direct impacts for rural populations.

An extensive review of the literature (IOB, 2013) reveals that access to photovoltaic solutions enables a decrease in energy expenditure for lighting and a reduction in indoor air pollution. Adapted financial services, as an instrument to facilitate access to RE solutions, can then contribute to generating such positive changes for rural populations. A study by PAMIGA (2016) on two microfinance institutions (MFIs) in Ethiopia, Buusaa Gonofaa and Wasasa, shows interesting results in this regard. Using a “difference-in-differences” methodology,⁵ with 215 “solar loan” clients and 61 control clients, the study demonstrates that the provision of solar loans has been instrumental in: (1) facilitating access to solar lamps for 92 per cent of concerned households; (2) completely stopping the use of kerosene lamps for 40 per cent of households; (3) extending the average number of hours of lighting per day from 4 to 5; (4) reducing energy expenditure by 64 per cent on average; and (5) making 68 per cent of concerned households perceive that they have better access to energy in terms of cost, power, healthiness and/or safety. Evidence of such positive impacts can be a strong driver for engaging socially oriented stakeholders into promoting and implementing RE finance projects (see Box 4).

Box 4. Positive impacts from financing RE

Zaynaba is an Ethiopian farmer and the mother of five children. She lives in Tijo Kerensa, a village with no access to the electricity grid. In June 2015, through her microfinance institution, Zaynaba was able to purchase a solar lantern on credit. Her household stopped using kerosene lamps, which Zaynaba saw as costly, unhealthy and not bright enough for her children to study.

Thanks to the solar kit, the family has significantly reduced its monthly energy expenses, from 120 to 40 Ethiopian birr. Zaynaba has now finished repaying her solar loan and is thinking of applying for a second loan to invest in a larger solar solution.

Source: Allet (2016a).

Domestic solutions bring economic benefits to clients. Some RETs can be applied to productive uses, and therefore contribute to developing small businesses and generating additional revenues. However, most loans provided to finance the purchase of RETs are for consumption purposes, such as pico solar solutions, SHSs or biogas digesters, which provide households' basic energy needs (e.g. lighting, mobile phone charging, radios, cooking, small appliances).

These RETs are usually not expected to generate additional revenues for the clients – revenues which could be used to repay the loan. Nevertheless, they often replace traditional, costly sources of energy (e.g. kerosene lamps, flashlights, diesel-based generators) and can help clients make savings on their monthly energy expenditure. A number of scientific studies have proved these positive effects, with an average reduction of 10-12 per cent in expenditures for lighting (IOB, 2013), and sometimes as much as 64 per cent (PAMIGA, 2016). This creates an opportunity for FSPs to offer financial services for domestic RETs without taking additional risks, by aligning the loan instalment amounts to the expected savings in energy expenditure, so that the loan repayment does not become an additional burden for target clients.

⁵ This methodology compares results from a treatment group and a control group, both on a baseline and an endline survey, to identify changes that can be attributed to the action.

There is demand for FSP involvement

RE solutions providers are looking for financial partners. The RE market in developing countries is young, with many TSPs still in their development phase. These providers are looking for financial partners to accompany their growth and cover their liquidity needs. They are looking for different types of financial partner: traditional banks and investors for debt and equity, but also MFIs to provide financial solutions to end-users.

TSPs often see various advantages in building partnerships with rural MFIs. In particular, it relieves them of the burden of pre-financing the RETs and managing repayments from customers. It also opens access to a new clientele and facilitates marketing and distribution thanks to MFI networks of rural branches. Even PAYG companies that have developed their own financial solutions through digital payments now tend to look for financial partners to pre-finance their RETs and manage credit (from assessment to reimbursement) in order to support their growth.

Box 5. How renewable energy solution providers want to work with financial services providers: the case of ARESS, Benin

ARESS, based in Benin, specializes in the installation and distribution of high-quality solar products, certified by Lighting Global. Over five years, ARESS sold over 8,000 pico solar solutions, benefitting more than 56,000 people. However, the company quickly realized that its growth was limited by the fact that the target rural populations could not afford the upfront costs of the solar solution and were not bankable.

In 2016, ARESS decided to sign a partnership agreement with Association des Caisses de Financement à la Base, a local microfinance institution (MFI) that focuses on women in peri-urban and rural areas. This partnership allowed ARESS to commercialize solar solutions for clients using credit, while being paid 50 per cent up front by the MFI, 25 per cent after three months, and the remaining 25 per cent after another three months. This approach allowed ARESS to expand its client base.

In parallel, ARESS decided to pioneer a pay-as-you-go (PAYG) solution in Benin. Since 2016, the company has distributed over 3,000 PAYG solar lanterns and 100 PAYG SHSs in remote off-grid areas. Even if the uptake of such solutions is good, this scheme puts a lot of pressure on ARESS's liquidity. The company is facing challenges to pre-finance the larger SHSs (costing €500-€1,000) and to handle the credit side of the PAYG offer (i.e. loan assessment and follow-up).

This is why ARESS is now building a partnership with RENACA, another MFI, to take over the credit management of their PAYG products. Customers willing to purchase a PAYG solar solution will be appraised by the MFI. If their creditworthiness is confirmed, the MFI will sign a PAYG loan agreement with the client and provide direct payment to ARESS. Customers will then repay the PAYG loan through digital payments made through ARESS's PAYG platform. All payments received will be transferred directly to the MFI. In cases of non-repayment, the ARESS PAYG platform will be able to remotely disconnect the solar solution, while the MFI will take care of recovery processes.

Such partnerships will reduce the pressure on ARESS's liquidity, support the growth of the company, and allow it to focus on the provision of technical services while financial partners take care of credit management. For financial services providers, the advantage is that they can benefit from the digital PAYG payment platform developed by ARESS, as well as from the solar solution remote disconnection functionality, which helps reduce the credit risk.

Clients trust their FSPs and are looking for guidance on the choice of RE solutions. In rural areas where some FSPs have developed close relationships with their clients, in particular savings and credit cooperatives (SACCOs) and rural MFIs, it is common for communities to ask their FSP for assistance in getting access to a RE solution. In contexts where people have had bad experiences with low-quality devices, they are even keener for FSPs to provide guidance regarding the type of RE solution they should opt for. This level of trust is, of course, directly related to the knowledge of RETs that FSPs have been able to develop. Provided adequate capacity-building has been conducted, there is a role for rural FSPs to play, not only as providers of adapted financial products, but often also as advisers or guides on the choice of RE solution.

Capacity-building helps FSPs get involved in energy financing. Experience shows that FSPs that have received training related to RE and energy financing often feel more comfortable and willing to engage in this sector, as they better understand the needs of rural populations, the benefits that their institution can expect from getting into energy financing, as well as the potential risks they will take. They are also better equipped to engage in this area with a clear risk management approach.

Box 6. How capacity-building supports FSP engagement in renewable energy financing: the case of Syndicate Bank and the SELCO Family in India

Syndicate Bank and the SELCO Family (SELCO Solar Light Private Ltd and the SELCO Foundation) have been strong partners since 1994, when Mr K.M. Udupa, the Chairman of Malaprabha Grameen Bank (a regional rural bank sponsored by Syndicate Bank), sanctioned 1.5 million Indian rupees (US\$30,000) for financing 100 solar lights. The bank informed its branches about the decision to finance solar lights – the first financing in Asia for solar for rural households. Since Malaprabha Grameen Bank was viewed as a progressive bank in rural Karnataka, other rural banks did not hesitate to emulate it. Syndicate Bank, seeing the success of this effort, went to great lengths to ensure solar lighting became a strong portfolio within the bank.

In 2002, the USAID-supported Solar Finance Capacity Building Initiative was implemented by Winrock International in partnership with Bharatiya Vikas Trust and SELCO. Syndicate Bank was a major partner in designing the training strategy and courses, preparing course materials, and in organizing and executing the training programme, in which over 1,000 managers from the bank participated. This initiative benefited the bank immensely in institutionalizing financing for solar, so that its managers understood the tenets of the techno-commercial viability of solar solutions.

Following this leap of faith in the technology, and with their confidence strengthened by the steady repayments from the underserved rural population, Syndicate Bank and its Regional Rural Bank made solar a major portfolio. In 2003, the United Nations Environment Programme went into a formal fund support agreement with Syndicate Bank and its regional rural banks to implement the United Nations Environment Programme Loan Programme to provide end-users with the benefits of interest subsidies and reduced down payments, while the bank received funding to conduct an awareness programme and offset the transaction costs of processing small loans. SELCO was an important partner in the programme, which ensured that end-users were provided with high-quality solar solutions and strong servicing and maintenance.

SELCO launched the Tribal Energy Access Project with Syndicate Bank in 2016, which aimed to provide energy to remote unelectrified households in Thuamul Rampur Block of Kalahandi District in Odisha. Despite the branch of Syndicate Bank being situated over 70 kilometres away from end-users, the bank financed 500 households through the formation of joint liability groups. SELCO placed a fixed sum in the bank as a risk guarantee fund to cover defaults. The solar solutions were provided by Prabhat Pradhan, the founder of Mukti Solar, who was selected by the SELCO Incubation Programme. This project is currently being replicated by SELCO and Syndicate Bank in other parts of Odisha and northeast India (i.e. Meghalaya and Assam) to benefit rural households and solar enterprises.

In 2016, Syndicate Bank launched an innovative financing programme aimed at facilitating loans for solar-powered livelihoods. It issued a circular memo to its branches, encouraging them to finance solar-powered livelihood investments, such as sewing machines, roti/papad rolling machines, photocopiers, photography equipment, milking machines, green looms and blacksmith blowers. The programme was the first attempt by any bank in the country to finance solar-powered livelihoods in a robust manner.

Syndicate Bank has played a key role in building the ecosystem for energy access and, in recognition of this, it was awarded the Suryamitra Award in 2016 by SELCO for its continued efforts to promote clean energy for rural communities.

Currently, SELCO is working closely with Syndicate Bank to develop innovative financing programmes tailored to the needs of different underserved households/entrepreneurs for sustainable energy for, among others, livelihoods, lighting and low-income housing.

There are ways to stimulate demand

Offering a variety of solutions helps to meet different needs. The type of RE solution in which a rural household, a smallholder farmer or a small rural enterprise is willing to invest varies greatly, according to their energy needs; cultural and social expectations; previous experience with RETs and level of trust; capacity to pay; investment priorities; and consumer behaviour (early adopter or follower), among other factors. Moreover, the needs of rural clients in terms of access to clean energy can also quickly evolve. Clients often prefer to start small (for instance with pico solar solutions) and then move up the “energy ladder” to larger solar solutions that supply power to a wider range of domestic or productive appliances. FSPs that provide financing for a variety of RETs usually experience a better uptake, as they have a better chance of matching the various needs of their target clients.

Box 7. Adapting financial services to a variety of energy needs: the case of Wasasa, Ethiopia

Wasasa is a microfinance institution (MFI) operating in Oromia region, Ethiopia. Since its creation in 2000, Wasasa has been providing poor communities with savings and credit services. It has over 118,000 clients today, with 78 per cent being in rural areas.

In response to high demand from its target clients, Wasasa decided to engage in renewable energy (RE) financing in 2013. It developed a specific loan product for this purpose, the “Liqaa Solaarii”. Based on a group lending methodology, this “Solar Loan” can finance up to 90 per cent of the cost of a solar solution, with amounts ranging between 500 and 15,000 Ethiopian birr for a duration of 4 to 12 months. Repayments are made through monthly instalments with different amounts that adapt to the seasonality of the cash flow of target clients. An interest rate of 13-18 per cent flat per annum is charged, according to the size of the loan.

Wasasa first entered into a partnership with a local distributor and started by offering loans for solar lanterns, deemed more affordable for target customers. Very quickly, Wasasa realized that its clients had a variety of needs and that solar lanterns were only addressing a small market segment. To better qualify the demand, Wasasa conducted a short survey with over 1,000 rural clients and discovered that demand was spread over more than 12 different types of solar solutions, ranging from 1.5 to 45 watt peak. One solution met 30 per cent of the demand, while eight other solutions saw 5-12 per cent of respondents expressing an interest. In addition, the preferences for one solution over another significantly varied from one rural branch to another.

Based on these results, Wasasa decided to offer a wider range of solar solutions to its clients and set up partnerships with three additional providers. In addition to solar solutions, Wasasa now also finances access to biogas solutions. It has been contacted by a government agency to join the National Biogas Programme, implemented in Ethiopia since 2008. As part of this programme, the Ethiopian Government provides a financial incentive for the construction of biogas digesters. The incentive is paid to construction companies upon completion, on the basis of user satisfaction, construction completion reports, and quality control reports produced by a monitoring entity. For clients, the amount of the financial incentive is directly deducted from the cost charged by the construction company. Wasasa then provides end-users with access to loans for financing the remaining cost of construction. Even though the pilot phase has shown very positive results, deployment has been challenging so far owing to the lengthy procedures needed to get the financial incentive from government agencies.

To finance its RE portfolio, for both biogas and solar, Wasasa managed to secure funding from a World Bank programme through the Development Bank of Ethiopia. The latter has allocated a credit line for MFIs to “lend on” to poor people to invest in clean energy solutions. This scheme has facilitated Wasasa’s engagement in RE financing.

Use “below-the-line” (BTL) marketing strategies. Even though the needs for improved energy solutions are real, experience shows that demand for energy loans may remain low at the beginning. This is because RETs are innovative technologies that are still not well known among rural populations, which remain risk-averse in their investment decisions, particularly when the purchase of a RE solution would be made through a loan. Having a financial product available is usually not sufficient to trigger the target populations’ decision to invest in a RE solution. Promotional activities have proved to be key to fostering such demand.

Experience has shown that it is most effective to use BTL sales techniques to promote RETs among rural base-of-the-pyramid populations. BTL sales techniques encompass all types of promotion that do not involve the use of mass media (e.g. radio, television, newspapers), but rather involve more tangible and local marketing techniques, such as door-to-door visits, exhibitions and displays, road shows and sponsorships. In the RE sector, many companies have opted for demonstration sessions organized at the community level, during market days, at microfinance group meetings, or other community-based group meetings and events. People like to see, touch and test a new technology before buying it. Showing pictures of the promoted solution (on flyers or posters) is usually not enough.

Offer top-up loans. Offering adapted financial products to clients willing to invest in RE solutions can stimulate demand. For risk management reasons, most FSPs do not provide two loans simultaneously to the same client. In this context, developing a dedicated loan product for RE solutions might not be the best way to stimulate demand: it would place the dedicated RE loan in competition with productive loans (e.g. agricultural or business loans), with a high likelihood that clients prioritize their productive loan, which is critical for their revenue streams.

A solution that has been successfully used by various FSPs, such as RENACA (see Box 8), is offering top-up or “bundled” loans in which the client can add a RE solution to its productive loan. Part of the loan is then disbursed in cash (for the productive activity), while the other part is disbursed “in kind” through the delivery of the selected RE solution. This type of financial product has the advantage of increasing the uptake of RE solutions at a very low marginal cost for both the FSP and the client since all loan processes (application, approval, contract, repayment) are combined, with only a few additional procedures.

Box 8. Top-up loans: the case of RENACA, Benin

The Réseau National des Caisses villageoises d’Epargne et de Crédit Autogérées (RENACA) is the Beninese national apex of the Self-managed Village Savings and Credit Associations (Caisses Villageoises d’Epargne et de Crédit Autogérées). The network is composed of eight associations and 24 service outlets, mostly set up in rural and peri-urban areas. RENACA reaches out to over 120,000 clients, of which 60 per cent are women.

RENACA got involved in RE lending in 2015. It built a partnership with two RE solution distributors to provide them with high-quality solar solutions, after-sale services and marketing support. Next, RENACA designed a dedicated loan product for solar solutions and adapted its bylaw to allow clients to have two loans simultaneously, provided they have the capacity to repay. However, a lack of communication on this possibility and constraints on processing two loan applications curbed the development of the RE portfolio.

RENACA then decided to introduce a top-up loan facility for solar solutions. For all clients with sufficient capacity to repay, loan officers and branch managers were asked to systematically offer RE solutions as a top-up during each loan application. This approach quickly had a positive impact on the development of the RE portfolio and, at the same time, facilitated communication and administrative procedures.

Building on this, RENACA decided to introduce this top-up loan approach for its own staff, allowing them to purchase solar solutions at credit in the frame of their employee loan facility. At the branch level, elected leaders were provided with special payment solutions to facilitate the purchase of RE products for local leaders, showing the way to the entire clientele.

There are ways to mitigate credit risk

FSPs that have been experimenting with RE financing have developed and tested various strategies to mitigate the risks related to this type of credit. Some have proven very effective in maintaining a high portfolio quality and client satisfaction level, and are now identified as good practices in the sector. A more exhaustive list of possible mitigation solutions is presented in the How To Do publication on this theme. Some of the key solutions tested in the field are discussed below.

Select quality RETs and partnering with TSPs. Promoting high-quality RE solutions is critical to ensuring customer satisfaction and mitigating the risk of default in the case of defective RE equipment. To make sure that their clients will only invest in high-quality solutions, some FSPs only promote RETs that have passed some national or international standards (such as Lighting Global's standards for pico solar solutions), when available.

A good practice often adopted is to require the RE solution to come with an effective warranty, for a duration at least equivalent to the term of the loan. For RE solutions that are not easily accessible on the local market, or for which quality levels may vary greatly, many FSPs also opt for a two-hand approach: the FSPs partner with selected distributors that provide high-quality technical solutions. In this case, clients can only get a loan for a RE solution offered by one of the partner providers of the FSP. The advantage of this approach is that, through such partnerships, FSPs can make high-quality solutions accessible to target clients in rural areas. Furthermore, they can control the use of the loan by disbursing the money directly to selected partners for the selected solutions, and therefore mitigating credit risks linked to equipment breakdown.

The two-hand model, however, also implies a key constraint for FSPs: clients are likely to hold them directly responsible in case of problems with the technology, as they will consider it to have been promoted by the FSP and may stop repaying their loans. When opting for a two-hand approach, FSPs have to select solutions and partners rigorously to truly mitigate the reputational and credit risks. One recommendation is to avoid exclusive partnerships with a single TSP, but opt for more open and flexible partnerships with several TSPs to limit the risk of abusive pricing due to a monopoly situation.

Box 9. Selection of RETs and partner TSPs: the case of FONDESURCO, Peru

FONDESURCO, a microfinance institution created in 1994, offers financial services to over 12,000 clients living in remote rural areas of Peru. In 2010, with support from Appui au Développement Autonome (ADA) and MicroEnergy International, it started a programme of access to renewable energy (RE) and energy-efficient solutions, with a focus on solar water heaters, solar dryers and efficient ovens. FONDESURCO wanted to make sure that its clients would get access to reliable, high-quality technologies. No certification existed for the type of technologies that it targeted, though. To help select adequate solutions, FONDESURCO decided to set up a partnership with a local university, which conducted evaluations and certifications of TSPs that wanted to be part of the project.

FONDESURCO opted for a two-hand approach and signed very detailed contracts with each TSP, specifying issues such as the characteristics of the equipment, the warranty duration (two years), and the obligation to always have spare parts and provide maintenance services. It designed a loan product with direct disbursement to the selected TSPs to ensure that the loan would not be diverted to low-quality RE solutions or other purposes.

This approach made the microfinance institution feel confident to disburse around US\$500,000 in RE loans to almost 1,000 customers – representing over 8 per cent of their client base – within three years.

Sources: ADA (2011); Casal Ribeiro (2012); Realpe Carrillo (2015).

Align instalments to savings on energy expenditures and cash flows. There is growing evidence that RE solutions can substitute traditional, costly sources of energy (such as kerosene lamps, flashlights, diesel-based generators) and can thereby help clients make savings on their monthly energy expenditure. In response, some FSPs have decided to design loan products in which the loan instalment amounts are aligned to the expected savings on energy expenditure. In such cases, the loan repayment does not come as an additional burden for target clients. This approach is also adopted by most PAYG companies. Aligning to expected savings on energy expenditure is not always possible, however, as in some case it would require very long loan terms. At the very least, financial products need to take into account the cash flows of customers to make sure that they will have the capacity to repay their loan from existing revenue sources.

Share financial risks with renewable energy TSPs. FSPs that decide to partner with selected TSPs sometimes manage to negotiate payment terms that allow them to share part of the financial risk. They agree, for instance, that 50 per cent of the price of the RE solution will be paid upon the loan approval, 25 per cent after three months, and the remaining 25 per cent after another three months. For the FSP, this procedure is not only a way to manage its liquidity, but also a way to make the TSP remain accountable in case of defective RE solutions.

Offer financial education modules adapted to RE debt management. In recent decades, a growing number of FSPs have been training their clients in debt management, with a clear objective to build their capacities to choose the type of loan adapted to their needs and capacity to pay, understand fully all conditions and requirements implied in borrowing, manage their revenues and expenses in a rationale way, and reduce risks of default and over-indebtedness. Some FSPs involved in RE financing, such as WPS in Kenya (see Box 10), are going one step further and adapting financial education modules to the specificities of RE loans (linked to equipment, possibly non-productive, generating savings) and systematically offering training to RE loan customers.

Box 10. Financial education for renewable energy debt management: the case of Wakenya Pamoja SACCO, Kenya

The Wakenya Pamoja SACCO (WPS) operates in western Kenya, serving over 120,000 clients who are mostly involved in tea and coffee production and in rural microenterprises. With most of its members having no or limited access to electricity, it was natural that WPS decided to start offering loans for access to solar energy in 2015.

After a careful selection process, the cooperative engaged in partnerships with two solar solution providers and designed specific financial products:

- A group-based solar loan product targeting lower-income clients. The loan ranges between 1,200 and 60,000 Kenyan shillings for a term of 6 to 12 months with monthly instalments. According to the capacity to pay and aspiration of clients, the loan can be taken as a stand-alone, parallel or top-up loan.
- An individual solar loan product with a similar loan range and duration for clients who do not want to engage in joint-liability loans and who can meet stricter eligibility criteria.
- A programmed savings account dedicated to clients who want to progressively build their savings with the objective of investing in a domestic or productive asset, such as a solar solution. This product can be used to invest in a solar kit or to build the cash collateral needed to apply for a solar loan. At the time of opening the account, the client defines the target amount that he or she wants to save (equal to the planned investment cost), the duration of the savings plan, and the monthly deposits that they will make. When reaching the target amount, they can then decide whether to use it to purchase the desired renewable energy technology.

WPS was already used to providing financial education training to its members (on debt management and savings) and was convinced that these sessions had a positive effect on its portfolio quality and savings mobilization. As most of its solar loans were used to invest in solar solutions for domestic use, it soon saw the need to train its members on how to manage non-productive loans.

With support from the Participatory Microfinance Group for Africa (PAMIGA), WPS developed a specific financial education module on RE debt management and made it a requirement for all members applying for a solar loan. This approach contributed to maintaining a higher portfolio quality for solar loans than for the other financial products it offered. Since 2015, WPS has provided financing for the purchase of over 3,000 solar solutions, with an average of 100-150 solar loans disbursed each month.

Set up an effective client-complaint mechanism to ensure customer satisfaction. Even if the RE solutions promoted have been carefully selected for their quality, there is always a risk of problems with the technology. Sometimes these are due to manufacturing defects, but most often they are caused by misuse by inexperienced end-users. FSPs with an effective mechanism to collect client complaints and respond to them diligently, in coordination with the concerned TSPs, often maintain higher levels of customer satisfaction, and therefore have a lower credit risk. Even if they face an issue with their equipment or loan, clients tend to remain satisfied as long as their problem is taken seriously and resolved efficiently.

Develop networks of “last mile” agents to ensure customer education, installation and after-sales services. TSPs, generally located in urban areas, do not always have decentralized representatives in rural areas to perform marketing tasks and after-sales services. Experience shows that they often tend to assimilate rural FSPs to retailers of technical solutions, expecting them to actively promote the RE solutions and distribute them on their behalf. As a consequence, FSPs’ field staff often have to assume a variety of additional activities, ranging from delivery of the RE solutions to educating clients on the use of the solution and the management of after-sales services. This goes far beyond what FSPs usually do and could lead to “mission drift”.

Quite often, this situation has a direct impact on staff motivation: because of all the extra customer services required around RE solutions, loan officers often perceive RE financing as too time-consuming. Experience has made it clear that FSPs alone cannot do it all: they are not in a position to act as a retailer and handle all technical services (i.e. marketing, delivery, installation, customer education, after-sales services). To bridge the gap between urban-based RE solution distributors and their rural target clients, a good practice is to set up networks of “last mile” agents in villages (see Box 11). These agents can be mobilized to promote RE solutions and offer high-quality local services to clients, which are critical to maintaining high satisfaction levels and contribute to reduced credit risk. FSPs can then focus on the financing aspects, which is more in line with their mission and capacities.



©IFAD/Nana Kofi Acquah
Ghana - Root and Tuber improvement and marketing Programme
Drying Gari in a solar dryer at Josma Farms. RTIMP and REP help provide Solar Dryers to their clients.

Box 11. Developing “last mile” agent networks: the case of MIFED, Cameroon

MIFED is a Cameroonian non-governmental organization that has been providing support services to rural microfinance institutions and self-managed village savings and credit associations in Cameroon, a country where 83 per cent of the rural population does not have access to the electricity grid. In February 2013, MIFED conducted a survey among rural microfinance clients to better understand their needs and expectations in terms of access to energy and finance. The findings confirmed a high demand for solar solutions.

In collaboration with the Participatory Microfinance Group for Africa (PAMIGA), MIFED started to support three rural financial services providers (FSPs) to offer microcredit for solar solutions to rural households and microenterprises. The model chosen was a partnership between the rural FSPs and selected solar solution providers. In this model, each partner was to bring its respective competencies: knowledge of rural clients, trustful relationships with them, and the offer of financial services on the FSPs’ side; and technical skills, the distribution of solar solutions, and after-sales services on the technical solution providers’ (TSPs) side.

The partner FSPs developed a specific loan product, “Crédit Lumière”, based on an individual lending methodology, with amounts ranging between 10,000 and 90,000 CFA francs, the duration between 3 and 12 months, and flexible instalment frequency to adapt to the seasonality of incomes of rural clients (monthly, quarterly, biannually or term repayments).

However, very quickly, the issue of distribution in remote rural areas – the well-known “last mile” challenge – came out. Partners realized that, on their own, loan officers were not in a position to manage all activities linked to sales, delivery, installation and after-sales services. They could not take the time required without affecting their microfinance activities. Furthermore, despite the training received, they were not sufficiently specialized in the business of solar solutions.

At the same time, solar solution providers remained reluctant to invest in their own networks of last-mile technical and sales agents. This represented a costly and risky investment in the eyes of TSPs due to their lack of knowledge of the rural market and their limited capacity to supervise such a network.

In 2014, MIFED and its partners decided to set up a team of “energy entrepreneurs”. These were co-opted by village savings and credit associations, in charge of identifying potential clients, orienting them to the FSPs, and ensuring the delivery, installation and maintenance of solar solutions. These entrepreneurs, who are all engaged in other activities as well, earn a commission for each sale and installation. They play the role of the “missing link” between TSPs, FSPs and end-users. Thanks to donor support, MIFED was able to recruit, train and supervise this network. By September 2017, 39 energy entrepreneurs were operational in the north, central, south and southwest regions of Cameroon.

The introduction of this model quickly brought several tangible results: (1) the uptake of solar solutions significantly increased as the energy entrepreneurs were actively engaged in promotional activities; (2) the burden on loan officers was reduced, resulting in higher motivation to engage in solar lending; (3) the rate of client complaints due to misuse of the solar solution decreased, thanks to the entrepreneurs’ efforts to educate clients on the good use of solar solutions; and (4) client satisfaction increased, contributing to building a positive image around the renewable energy finance programme.

Convinced of the relevance of the energy entrepreneur model and willing to ensure its sustainability, MIFED and PAMIGA are now planning to set up a formal social enterprise specializing in the distribution of solar solutions to the last mile in rural Cameroon.

Sources: Allet (2016a, 2016b).

Challenges

Lack of business cases

Despite the potentially important role that decentralized RE systems can play in rural and regional electrification efforts, their commercial development still hinges on fundamentals such as proving a viable business model. The development of such business models could enrich understanding of the various financing mechanisms available and how to manage project-level risks.

Lots of pilots, few success stories. Even though a growing number of actors are engaging in RE finance projects, the vast majority seem to remain at the pilot phase, with only a few hundred RE loans disbursed (and sometimes even fewer). There are a few success stories, such as Grameen Shakti in Bangladesh and M-KOPA in East Africa. However, they seem to have developed in very specific contexts (e.g. a favourable environment with a high level of subsidies and support in Bangladesh, the string development of digital finance in East Africa, strong leadership and capacity to mobilize financing). Most other RE finance programmes face clear difficulties in scaling up.

A lack of data on the profitability of financial products for FSPs. Many FSPs started to finance RE based on portfolio and income projections built by technical partners. Beyond such ex ante projections, there is a clear lack of data on the financial sustainability of such products. These portfolios are young and, in many cases, still in a pilot phase at the level of the FSPs, making sustainability analysis difficult. Moreover, many FSPs receive technical support and/or subsidies to cover initial costs like market studies, product development or training, and do not necessarily feel the need to perform a specific profitability analysis for the RE portfolio. Having clear business cases would, however, be helpful in engaging FSPs in this sector.

A lack of knowledge on the portfolio quality of PAYG models and their profitability. PAYG companies often communicate extensively on their outreach in terms of sales volumes and numbers of clients – but they remain quiet regarding the quality of their portfolio or the profitability of their business model. Furthermore, many PAYG companies received subsidies from donors to start their activities or to finance their scaling phase. It seems that PAYG companies need to be at scale to be profitable, but the lack of transparency and data on their activities does not allow analysis of their actual profitability, making it difficult to forecast their sustainability over longer time periods.

A lack of data on the financial sustainability of last-mile customer support activities. A variety of last-mile distribution models have been tested in recent years by RE solution providers, such as developing their own network of last-mile agents (the proprietary distribution model); “piggybacking” on existing networks (e.g. gas stations, telecom retailers); and fostering local entrepreneurship. However, no “miracle” solution has yet been found and all these models still face important challenges in terms of effectiveness and financial sustainability.

When such networks are developed by RE providers themselves, there is often little access to data related to the financial sustainability of such models. When networks of last-mile agents are set up within subsidized projects, financial analysis is not systematically performed and post-project continuation often remains a challenge. Key challenges still remain, including to develop cost-efficient models, to set up networks of last-mile agents with the required skills, to ensure their close monitoring, and to keep them motivated over time.

Weaknesses in the rural finance and RE sectors

Weakness in the RE supply chain makes it difficult to keep FSPs engaged and motivated. When rural FSPs start offering RE finance services, they often find out very quickly that most RE solution providers are not familiar with the rural, base-of-the-pyramid market; many traditional RE providers are used to bulk sales of RE products and calls for proposals for public markets. They do not always have RE solutions that are adapted to the needs of their clients, do not get involved in BTL marketing activities as initially planned, do not have the local presence to perform efficient after-sales services, and often have limited financial resources which constrains their capacity to deliver (e.g. their stock is too small to meet demand, long delays in importing). In many countries, the lack of maturity in the RE supply chain can demotivate FSPs willing to engage in this market and make it difficult for them to find appropriate partners.

Weaknesses in the rural finance sector constrain the growth of renewable energy TSPs. RE solution providers that are looking for partner FSPs can face difficulties in finding adequate partners. In many countries, the largest, more solid FSPs are often focused on urban or peri-urban areas only. Those operating in rural areas, such as SACCOs, may often be quite small and have limited resources. Furthermore, FSPs tend to prioritize what they consider to be their core business activities over developing a RE portfolio. Even when they engage in RE finance, FSPs are not always able or willing to dedicate the human and financial resources required to develop their RE portfolio at the pace expected by TSPs. Because of these weaknesses, several RE companies have decided to develop in-house financing solutions (in particular through PAYG).

Uneven development of digital finance hinders the development of PAYG solutions. PAYG companies have based their business model on the availability of digital financial services. It is no surprise, then, to see that PAYG has developed fastest in East Africa, where digital finance services are widely available and adopted; in West Africa, where digital finance is still at an early stage of development, PAYG initiatives remain scarce. In countries where digital finance is not well developed, offering RE finance through a PAYG solution represents a double burden for the RE company, which needs to educate customers on digital finance services before being able to use the PAYG system.

Inadequately subsidized schemes can distort the market for both TSPs and FSPs. In some countries, such as Viet Nam, existing subsidies on fossil fuels⁶ make investment in RETs less attractive and can hinder the development of the RE supply chain, as well as RE financing offers. At the same time, largely subsidized programmes of access to RETs have the disadvantage of crowding out private sector players (both TSPs and FSPs) while reaching only a limited number of beneficiaries.

Used in a smart way, public subsidies can play a positive role in promoting access to RETs and RE finance. But subsidized schemes need to support the creation of a more level playing field for private sector actors to engage in a sustainable way and for RETs to be more competitive in rural energy markets. Subsidies can be used to support the activities listed in the recommendation section of this Note, such as capacity-building for key stakeholders; developing distribution channels at the last mile; promoting BTL marketing techniques; increasing access to affordable sources of funding for TSPs and FSPs; digitizing rural FSPs; and research and development into productive RETs for the agricultural sector.

⁶ In 2013, the International Energy Agency estimated that subsidies for fossil fuels amounted to US\$548 billion (IEA, 2014).

Complex, multistakeholder projects

A common goal but different visions. The development of a RE portfolio is usually the result of complex, multistakeholder partnerships. These stakeholders may decide to collaborate towards similar objectives (e.g. improving access to RE solutions for low-income populations). However, their visions may greatly differ: where some stakeholders see opportunities, others see risks.

RE providers sell RE solutions as their core activity. They see partnerships with FSPs as a great opportunity to expand their outreach. Their attitude is to push demand as much as possible in order to maximize their sales volumes. On the other hand, FSPs usually perceive RE financing as just one financial product among many others and have to balance their level of effort towards developing the RE portfolio according to their strategic priorities. Moreover, FSPs have the dual objectives of increasing outreach while also maintaining good customer relationships and managing their credit risk. When engaging in RE finance, FSPs need to go through a learning curve, and integrate new products and practices, in addition to careful appraisal processes that can appear lengthy and inefficient in the eyes of TSPs. These two antagonistic approaches – risks versus opportunities – can make it difficult for partnerships to succeed.

Building strong, trustful partnerships is a long-term process. When the approach chosen is to build local partnerships between FSPs and TSPs (the two-hand model), experience shows that it is important not to underestimate the time needed to build understanding and trust between the different actors. FSPs and TSPs come from two different sectors that are not used to working together. They each have their own vision, procedures and technical language. Furthermore, FSPs and TSPs do not always fully understand the constraints faced by their partners (such as minimum volumes for delivery for distributors, or the seasonality of loan applications in rural areas for FSPs).

These differences in expectations, and misunderstandings about each other's constraints, have sometimes led to tensions between the partners, which require frequent and honest discussions to overcome. One cannot expect two-hand model approaches to be fully functional and sustainable from the beginning: building partnerships between FSPs and TSPs remains a learning process that requires strong motivation, commitment, patience and perseverance from all partners. Furthermore, there is often a time mismatch between the average duration of RE finance support projects (two-three years) and the actual time needed to build sustainable partnerships.

Having a facilitator is key to building strong partnerships between FSPs and TSPs. For the two sectors to understand each other, communicate and work together effectively, experience shows that it is essential to have an organization that can act as a facilitator during the start-up phase, to ease the tensions and progressively enable partners to better understand each other (e.g. through regular workshops, exchange visits, adjustments of detailed procedures, moderation). Projects that have a non-governmental organization (NGO) or other entity actively playing the role of facilitator are usually more successful in building long-lasting partnerships.

Box 12. The role of the facilitator: the case of the Participatory Microfinance Group for Africa (PAMIGA)

PAMIGA is a non-profit organization that aims to unlock the economic potential of rural areas in sub-Saharan Africa. Since 2013, it has been implementing a programme of access to solar energy through microfinance in various countries, including Benin, Cameroon, Ethiopia, Kenya and Senegal. As part of this programme, PAMIGA assisted partner financial services providers (FSPs) in assessing the energy needs of their clients, developing adapted financial products, and building internal capacities to engage in energy lending. PAMIGA also facilitated the set-up of partnerships between rural microfinance institutions (MFIs) and solar solution providers, organizing workshops to introduce the partners to each other, and facilitating discussions around the signature of a partnership agreement and the development of common procedures.

Yet very quickly, misperceptions, misunderstandings and tensions arose among the new partners. In Kenya, field staff from the solar solutions company complained that the partner savings and credit cooperative (SACCO) was approving very few loan applications for solar equipment. They felt that it was not actually interested in this sector, and was wasting their time and marketing efforts. They also argued that SACCO's procedures were inefficient and should be changed to collect and validate loan applications right after a demonstration session. On the other side, the SACCO felt that the solar company was too aggressive commercially with their clients and did not respect their criteria and procedures.

As a facilitator, PAMIGA tried to make each partner understand the perceptions of the other. In particular, it explained to the solar company why the SACCO cannot be driven by sales volumes alone, but has to adopt a more cautious approach to manage its credit risk and follow eligibility criteria and rigorous procedures. PAMIGA also raised awareness on client protection principles and why some time for reflection has to be given to customers before making a loan demand.

As a result, the SACCO and the solar solutions company decided to coordinate better ahead of field demonstration sessions in order to focus marketing efforts on preselected clients who were eligible for a solar loan.

At the beginning of a partnership in Cameroon, the renewable energy (RE) solution distributor faced an unexpected delay in delivering the first batch of solar solutions to rural microfinance clients. Because of the lack of clear communication, its partner MFIs did not understand the reasons for this delay and started to question the reliability of the distributor, refusing to disburse additional solar loans. Tensions were very high and the possibility of a clash was likely.

PAMIGA investigated and learned that the RE solution providers had not anticipated demand sufficiently. The MFIs' promotional actions were more effective than the distributor had expected. Demand was suddenly high, the existing stock insufficient, and the larger batch of imported solar solutions was still going through the lengthy process of customs clearance. PAMIGA had to sensitize the MFIs on the constraints linked to the importation and stock management of solar solutions (e.g. stock size is limited by liquidity constraints, as well as the fact that store solar kits cannot be stored for more than six months without damaging the batteries). As a consequence, the MFIs decided to regularly share the forecast demand for the next three to four months, based on their planned promotional actions, in order to help the solar solution provider better anticipate demand and manage its local stock.

Through such experiences, PAMIGA understands that its role is key to facilitating not only the set-up of partnerships between rural FSPs and solar solution providers, but also their implementation and strengthening over time.

A clear distribution of roles between partners is needed. When opting for a two-hand model, lessons learned from field experiences emphasize the importance of defining a clear distribution of roles and responsibilities between partners (Levai, Rippey and Rhyne, 2011; Morris et al. 2007; Rippey, 2009; Winiiecki et al., 2008). In this model, the general idea is that each actor brings its respective competences and collaborates to jointly overcome the main barriers to access to clean energy. The TSP provides high-quality technologies, together with crucial customer services such as delivery, installation, customer education, warranty and after-sales services. The FSP gives access to its client base and offers financial services to facilitate investment in the solar solution.

However, in each case, the exact demarcation of roles can differ slightly in order to find the most efficient model according to the capacities and expectations of each partner, as well as the context of the intervention. For instance, in some contexts, the FSP may be willing to take over responsibility for delivering the solar solutions from their branches to end-users; in other contexts, this task will be performed by the TSP. Experiences from the field show that RE finance projects are more successful when the exact roles are formalized in a partnership agreement or memorandum of understanding.

A fast-evolving sector

Keeping pace with RE innovations is critical for meeting demand and remaining competitive. With very frequent innovations and upgrades to technical solutions, the offers of RE providers are constantly evolving. For FSPs engaging in RE finance, it appears quite challenging to follow this dynamic market closely and always be in a position to provide the most up-to-date, cost-effective solutions to their clients. Moreover, the needs of rural clients, in terms of access to clean energy, can also quickly evolve. Clients with little experience of RE tend to start small (i.e. with pico solar solutions) and then move up the energy ladder to larger solar solutions that can power a wider range of domestic or productive appliances. This context of technological innovation and changing needs requires a high capacity to review and adapt constantly to offer appropriate RE finance solutions and remain competitive.

Uneven competition from low-quality solutions affects the uptake of RE finance solutions. The fast development of the RE sector in recent years has resulted in a growing number of low-quality or counterfeit products being distributed on local markets. Controlling the quality of RE solutions is a real challenge in developing countries. Some certifications, like Lighting Global (developed by the World Bank Group) exist, but the lack of large-scale awareness of these means they are not very useful for end-users. Moreover, certification is not yet available for all types of RET: at present, only pico solar and small SHSs benefit from internationally recognized certification.

FSPs and TSPs that offer financial solutions for RETs typically favour better quality or certified solutions, which present a lower credit risk for them. But these are usually more expensive, making their marketing more difficult to base-of-the-pyramid clients, who are extremely price-sensitive. The general lack of control of RET quality makes the competition uneven for FSPs and TSPs that offer financing for high-quality certified solutions.

Follow-up and strategic recommendations

The key recommendations based on the lessons learned from field experiences are briefly presented below. These recommendations are further detailed in IFAD's Note "How To Do: Access to Finance for Renewable Energy Technologies".

Recommendations for project design

Preconditions for IFAD to support RE finance projects

Although innovations in RETs are growing at a rapid pace, not all countries or regions are at the same stage of readiness for the successful deployment of RE financial solutions. Prior to supporting a project, IFAD's project design teams should collaborate with stakeholders to evaluate the overall landscape for RE financing. Specifically, this assessment should inform IFAD and its partners about the following dimensions:

- **Demand assessment.** The energy and financial needs of rural populations can be varied. Identifying and understanding the specific characteristics of the target market is critical to ensure the successful uptake and use of both RE and financial solutions. Market segmentation, in-depth needs assessments and market sizing are critical exercises for project design.
- **RE landscape assessment.** The level of maturity of the RE supply chain varies greatly from one country or region to another. Mapping the RE landscape is essential to gauge the feasibility, viability and scalability of a RE finance project. This mapping task should include an assessment of the regulatory environment, the available RE solutions, and the potential distribution networks in rural areas.
- **Financial services landscape assessment.** Evaluating the coverage of formal and informal financial services in rural areas is critical for identifying the gaps faced by rural populations. These gaps can inform the direction and prioritization of IFAD's support and engagement, as well as the role of FSPs or PAYG providers. Assessments in rural areas should include the availability of FSPs, the availability of vendor finance and PAYG solutions, and the availability and usage of digital finance services.
- **Stakeholder identification and engagement.** Before launching a RE finance project, it is essential to identify and engage key stakeholders, in particular FSPs that want to offer financial services for access to RE; TSPs that are willing to partner with FSPs or develop their own financial services; service providers (e.g. NGOs, public bodies) that can provide support services, such as general awareness-raising on RETs, capacity-building to FSPs and TSPs, and facilitation for the development of partnerships.

Guidance for FSPs on the design of financial products

For a FSP willing to offer RE finance, there is no need to design a financial product from scratch. A good approach is to start with a financial product that is already working well, and identify which features need to be adapted to fully fit the specificities of RE financing. For this purpose, we recommend that FSPs or RE companies willing to develop their own finance solutions:

- **adopt a client-centric mindset** by keeping target clients at the centre of the whole design process;
- **use a risk-management approach** by identifying the specificities of a RE financial product (i.e. what makes it different to other financial products already offered by the FSP?); the risks associated with these specificities (e.g. credit risk, reputation risk, operational risk, liquidity risk, financial risk); and the possible mitigation solutions for each of these risks;

- **align with client protection principles**, the “minimum standards that clients should expect to receive when doing business with a microfinance institution” (SMART, 2014). When designing RE financial products, specific attention should be given to transparency, in particular to the “hidden costs” of RETs (e.g. installation or maintenance costs, financial terms for PAYG providers), and mechanisms for resolving client complaints.

Recommendations for project implementation and scaling up

Recommendations for implementation

- **Build the capacities of FSPs and PAYG providers.** Capacity-building is critical given FSPs’ lack of experience in the RE sector and the lack of experience of PAYG providers in financial product design and management.
- **Support NGOs that accompany stakeholders and act as facilitators.** When the approach chosen is that of building local partnerships between FSPs and TSPs, experience shows that having a facilitator is of significant help in terms of building trust among partners. A specialized NGO playing the role of facilitator can help FSPs and TSPs overcome misunderstandings and tensions, improve their understanding of each other, facilitate negotiations to achieve balanced “win-win” agreements, and keep motivation up.
- **Encourage BTL marketing strategies.** To foster uptake in rural areas, BTL marketing strategies should be encouraged, such as displaying RETs in demonstration sites, organizing demonstration sessions during group meetings or market days, and setting up sponsorships programmes.
- **Support the development of last-mile agent networks in rural areas.** The limited capacity of the RE supply chain to reach remote rural areas remains the most critical challenge faced by RE finance projects. There is a clear need to support the development of decentralized networks of sales agents and technicians for greater outreach and high-quality, efficient and sustainable customer services in rural areas.
- **Facilitate access to capital for FSPs and TSPs.** FSPs operating in rural areas often have limited financial resources and may lack capital to develop a RE portfolio. TSPs face financial constraints to develop their local presence in rural areas and/or to expand offers of PAYG services. Facilitating access to capital (e.g. through matching grants, equity, credit lines, guarantee facilities) is instrumental in developing RE finance.



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Recommendations for scaling up

- **Encourage innovation in productive RE solutions.** There is still a lack of adapted, efficient and affordable RE solutions to respond to the productive needs of smallholder farmers and rural businesses. Having a broader variety of RE solutions to fit these needs would significantly increase the uptake of RE solutions. Innovations to develop such solutions should be further supported.
- **Adopt a value-chain or ecosystem approach.** To have more impact, the right approach is to provide financial and technical support simultaneously to all relevant actors in the RE value-chain (in particular FSPs and TSPs), with a vision to build complete, efficient ecosystems for access to RE solutions in rural areas.
- **Digitize rural FSPs.** Using digital channels could enhance the outreach and uptake of loans for RE solutions, for instance by integrating some features of the PAYG model into the current microfinance model.
- **Encourage experience-sharing and develop business cases.** Even though experiences in RE finance have multiplied in recent years, knowledge of lessons learned and best practices have not been widely disseminated. National networks of FSPs and RE TSPs, which are starting to develop, could be supported to facilitate experience-sharing among local stakeholders and develop business cases useful for the industry

- **Call for more conducive national policy frameworks.** To support both TSPs and FSPs in their efforts to promote access to RETs, more conducive national policies are needed, such as: (1) shifting the allocation of national subsidies from fossil fuels to RETs to help develop the RE market in rural areas where transaction costs are high; (2) defining net-metering policies, which ensure that excess energy can be sold back to the grid, allowing grid-connected rural communities to make a profit from investing in RETs.
- **Support the development and adoption of quality standards for RE solutions.** In places where there is a proliferation of counterfeit and cheap RE solutions, standards are critical to help FSPs and rural clients differentiate low-quality technologies from high-quality ones. Helping governments to develop their certification capacities for various types of RE solution would be useful in preventing the further proliferation of low-quality technologies, as well as encouraging the local production and/or assembling of high-quality solutions.
- **Appeal for the endorsement of client protection principles by PAYG providers.** TSPs that are providing financial solutions through PAYG have been doing so under very vague regulations in most countries. Overall, there is a clear lack of transparency in the PAYG sector, as well as sometimes rather aggressive commercial strategies that leave end-users unprotected. Mainstreaming client protection principles into PAYG providers' practices is crucial for avoiding crises similar to those faced by the microfinance sector.
- **Promote "end-of-life" management for RE products.** So far, little attention has been paid to the negative impacts that will be generated by RETs when they reach the end of their life. However, if RE solutions reach a large scale, all stakeholders will soon be confronted with a waste management issue. It is essential that all stakeholders start reflecting more actively on possible strategies for RET waste collection, disposal and recycling.

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