

# Access to finance for renewable energy technologies

## Inclusive rural financial services



Photographer: Conrad Roedern  
Installation of a solar home system near Bukalo in the Zambezi Strip, Namibia.

## Introduction

Access to affordable, reliable and sustainable energy is often associated with economic development and considered as vital to alleviating extreme poverty. Yet access to clean sources of energy is still a challenge for many smallholder farmers, their families and other rural entrepreneurs. Recent advancements in renewable energy technologies (RETs) have started to make the achievement of Sustainable Development Goal 7 possible – “Ensure access to affordable, reliable, sustainable and modern energy for all”.

Beyond technology development, the challenge now is to make these technologies accessible to rural populations. As RETs require some upfront investment, access to end-user finance is a key component to facilitate their wider adoption. In recent years, donors and financial service providers (FSPs) have increasingly been investing in demonstration projects to facilitate access to financial services for RETs. Recent experimentation offers key lessons for the design and delivery of suitable renewable energy finance options for rural populations.

## Background and context

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 the lack of alternatives, these poor rural households still rely on kerosene-based solutions, candles or flashlights for lighting their house. These sources of energy, however, are costly, unreliable and harmful to health. Around 4.3 million deaths per 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.

A 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 intermittent. A lack of access to affordable energy can also prevent smallholder farmers from developing irrigation systems that could otherwise improve their yields and increase the area of their land that is cultivated.

RET solutions for these target groups do exist today: 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 smallholder farmers, their families and rural entrepreneurs. Their adoption remains limited, however, due to inappropriate policy frameworks, low awareness among these target groups, the lack of physical access to RETs in rural areas, and the lack of financial resources for target end-users to invest in them.

## Rationale

RETs usually have a positive return on investment, as they substitute more expensive traditional sources of energy and, when used productively, can generate additional sources of revenue. However, the upfront costs remain a key issue for most rural households, smallholder farmers and entrepreneurs.

Adapted financial services could help overcome this financial barrier and expand access to renewable energy in rural areas. FSPs can, for instance, offer specific loan products for access to RETs, adapted to the needs and constraints of rural clients. Technical solution providers (TSPs) that distribute RETs can also develop their own end-user financing schemes, for instance through pay-as-you-go (PAYG), a technology that allows end-users to pay digitally for renewable energy in small instalments, or through the commercialization of energy as a service (e.g. battery charging, renting solar lanterns, renewable energy service companies).

## Challenges, opportunities and benefits

Today, significant challenges constrain the expansion of renewable energy finance:

- **Dependence on the level of maturity of the RET supply chain:** Financing renewable energy solutions implies that adapted, high-quality renewable energy solutions and all related customer services are available on the local market. Even though the renewable energy 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 have significant weaknesses. In particular, existing RETs do not yet necessarily cover all types of need (in particular, productive energy needs) and are not distributed everywhere. Furthermore, in most countries, RET distributors are 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 though many rural people have already heard of some RETs, misunderstandings and misconceptions remain regarding these technologies, creating false expectations or low interest. A lack of information on RETs (e.g. their functioning, uses, capacities, limitations, maintenance) constitutes a key barrier to their adoption within rural communities. RETs remain “push” products that require significant promotional efforts to overcome the low awareness and risk aversion of rural populations.
- **Competition from low-quality, cheap solutions:** In places where RETs can be found easily in local markets or secondary towns, people are regularly confronted with problems of quality linked to cheap solutions: counterfeit and low-quality equipment with no warranty, among other issues. Bad experiences with low-quality solutions can generate significant distrust in RETs in some countries.
- **Inadequate policy frameworks:** Many countries still largely subsidize fossil fuels, which distorts the market for RET solution providers. They also lack conducive policies, such as net metering, which would make investments in RETs more compelling to grid-connected rural communities.
- **High-risk perception from FSPs:** Because of these challenges (low awareness levels, commercialization of low-quality solutions, lack of presence of TSPs in rural areas), the risk that customers are not happy with their renewable energy equipment is high. This can translate into a direct credit risk and/or reputational risk for FSPs. As a consequence, FSPs are often reluctant to engage in the renewable energy sector.
- **Limited capacity of renewable energy companies to provide payment solutions themselves:** Developing vendor finance solutions, such as PAYG, requires renewable energy companies to build internal competences related to credit management and to initiate a change of mindset and not look only at sales volumes but also at portfolio quality. Furthermore, selling RETs on PAYG or as a service (e.g. battery charging, renting, renewable energy service companies) also implies pre-financing of the renewable energy products. Renewable energy 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 requires using resources to build partnerships and ensure coordination with renewable energy solution providers. It also requires having sufficient funding available to finance a new type of portfolio. Not all FSPs are in a position to develop such innovative financial products

However, renewable energy finance still presents great opportunities:

- **Benefits for rural households, smallholder farmers and rural businesses:** RETs can help rural households reduce their energy expenditure and improve their living conditions (e.g. less indoor air pollution, better quality of lighting). They can enable smallholder farmers to increase the area of their land that is irrigated, increase their yield, diversify their sources of revenues (e.g. different crops, grain and fruit drying, cooling, storage, processing activities) and, as a consequence, increase their revenues and improve their resilience to climate change and shocks. Renewable energy solutions can foster the creation and development of rural businesses, which can 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 others. In addition, RETs provide access to energy while reducing pressure on natural resources and reducing greenhouse gas emissions.

- **Benefits for entities providing renewable energy finance:** For FSPs, engaging in renewable energy 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; improving their ratings in terms of social, environmental and climate assessment procedures; and attracting new sources of funding. FSPs with a social mission are also likely to be driven by the positive economic, social and environmental impacts that can be expected by facilitating access to renewable energy. For TSPs commercializing renewable energy technologies, developing their own financing solutions could bring some key benefits, such as significantly expanding their outreach to lower-income customers and rural areas, differentiating themselves from competitors, and avoiding a reliance on external partners such as FSPs.

## Summary of past experiences

- **Field experiences are developing and contributing to identify good practices.** A growing number of experiences are being gained, with a variety of models being tested: from FSPs setting partnerships with TSPs (the “two-hand model”) to TSPs developing their own financial solutions (PAYG, energy as a service) and FSPs creating their own subsidiary for RET distribution and financing. Exact modalities of implementation differ greatly from one project to another, providing a great source of learning on what works and what does not. Some success stories, such as Grameen Shakti (Bangladesh) and M-KOPA Solar (East Africa), confirm the high potential of renewable energy finance. Knowledge of good practices is also growing thanks to the increasing number of publications from practitioners on lessons learned from renewable energy finance projects.
- **Access to RETs generates positive impacts.** A growing body of literature demonstrates the positive changes that access to renewable energy can bring to the livelihoods of end-users, including reduced energy expenses, improved living conditions and reduced indoor air pollution. Many studies show that RETs used by households for domestic purpose also bring economic benefits to clients, as they replace traditional costlier sources of energy (such as kerosene lamps, flashlights and diesel-based generators).
- **There is a demand for FSP involvement.** This demand comes first from RET providers, which see various advantages to building partnerships with rural FSPs for end-user finance. These include: (1) relieving them from the burden of pre-financing RETs and managing repayments from customers; and (2) opening access to a new clientele and facilitating marketing and distribution, thanks to FSP networks of rural branches. Demand for FSPs’ involvement also comes from rural clients themselves. In rural areas where some FSPs have developed close relationships with their clients, it is not unusual for rural communities to ask their FSP for assistance in getting access to a renewable energy solution, as well as guidance regarding the type of RET they should choose.
- **Capacity-building efforts help FSPs get involved in energy financing.** Experience shows that FSPs which have received training related to renewable energy 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, and the potential risks they will take.

- **There are techniques to stimulate demand.** For instance, FSPs that provide financing for a variety of RETs usually experience a better uptake, as they have a better chance of matching the variety of needs of their target clients. Experience has also shown that it is most effective to use “below the line” sales techniques, such as door-to-door visits, exhibitions and displays, road shows or sponsorships, to promote RETs among rural “base of the pyramid” populations. Various FSPs have opted for offering “top-up” or “bundled” loans, in which clients can add a RET to their productive loan; this type of financial product has the advantage of increasing the uptake of RETs at a very low marginal cost for both the FSP and the client.
- **There are ways to mitigate credit risk.** These include selecting high-quality RETs and partnering with TSPs; aligning instalments to savings on energy expenditures and cash flows; sharing financial risks with RET providers by negotiating payment terms; offering financial education modules adapted to renewable energy debt management; setting effective client complaint mechanisms to ensure customer satisfaction; and developing networks of “last mile” agents to ensure customer education, installation and after-sales services.
- **There is a lack of business cases.** Despite the potentially important (decentralized) role that renewable energy systems can play in rural and regional electrification efforts, their commercial development still hinges on fundamentals such as proving a viable business model. Even though a growing number of actors are engaging in renewable energy finance projects, the vast majority seem to remain at a pilot phase, with only a few hundred renewable energy loans disbursed (and sometimes even fewer). Clear and transparent data are still lacking on the actual financial sustainability of financial products developed by FSPs, on the portfolio quality of PAYG models and their profitability, and on the financial sustainability of last-mile customer support services. The development of such business models could enrich the understanding of the various financing mechanisms available and on ways to manage project-level risks.
- **There are weaknesses in the rural finance and renewable energy sectors.** In many countries, the lack of maturity of the renewable energy supply chain (e.g. a lack of presence in rural areas, limited resources and capacities) can demotivate FSPs willing to engage in this market and make it difficult for them to find appropriate partners. At the same time, renewable energy solution providers that are looking for partner FSPs also face difficulties in finding adequate partners (e.g. due to a lack of presence of solid FSPs in rural areas, limited resources and capacities). The uneven development of digital finance also hinders the development of PAYG solutions. And, in some cases, inadequately subsidized schemes distort the local market, crowding out private sector actors like TSPs and FSPs.
- **Complex, multistakeholder projects.** The development of a renewable energy portfolio is usually the result of a complex, multistakeholder partnership. These stakeholders may decide to collaborate along similar objectives (e.g. improving access to RETs for low-income populations). However, their visions can sometimes differ greatly: where some stakeholders see opportunities, others may see risks. These two antagonistic approaches can make it difficult for partnerships to succeed. Experience shows that building strong, trustful partnerships between TSPs and FSPs is a long-term process and having a facilitator is key to successfully building long-lasting partnerships. A clear distribution of roles and responsibilities between partners is also critical.
- **A fast-evolving sector.** With very frequent innovations and the constant upgrading of technical solutions, the offers of renewable energy providers are constantly evolving. For FSPs engaging in renewable energy finance, keeping pace with innovations is critical to meeting demand and remaining competitive. However, FSPs and TSPs offering finance for high-quality certified solutions still face uneven competition from low-quality solutions owing to the general lack of standards and control of RET quality.



## Summary of key issues

### Preconditions for IFAD's engagement

Before supporting a project, IFAD's project design teams should evaluate the overall landscape for renewable energy financing:

- **Demand assessment:** identify and segment the target market, assess needs and estimate the market size.
- **Renewable energy landscape assessment:** assess the regulatory environment, the available RETs and the potential distribution networks in rural areas.
- **Financial services landscape assessment:** evaluate the coverage of formal and informal financial services in rural areas, including FSPs, PAYG providers and digital finance services.
- **Stakeholder identification and engagement:** identify and engage key stakeholders that can contribute to developing an ecosystem for inclusive renewable energy finance.

A thorough analysis of these multiple dimensions will ensure an appropriate match between demand and supply under the right conditions.

## Guidance on design and implementation

The design of renewable energy financial products for rural populations should consider the following key recommendations:

- **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 specifics of a renewable energy financial product, the associated risks and possible mitigation solutions.
- **Align with client protection principles.**

Key roles for IFAD in the implementation of renewable energy finance solutions include:

- building the capacities of FSPs and PAYG providers
- supporting non-governmental organizations that accompany stakeholders and act as facilitators
- encouraging below-the-line marketing strategies
- supporting the development of last-mile agent networks for high-quality, efficient renewable energy customer services in rural areas
- facilitating access to capital for FSPs and TSPs
- encouraging innovation in productive renewable energy solutions for the agricultural sector
- adopting a value-chain or ecosystem approach by providing financial and technical support simultaneously to all relevant actors in the renewable energy value chain
- digitizing rural FSPs to foster the development of PAYG financial solutions

- encouraging experience-sharing and developing business cases
- calling for more conducive national policy frameworks on energy subsidies and net metering
- supporting the development and adoption of quality standards for renewable energy solutions
- appealing for the endorsement of client protection principles by PAYG providers
- promoting end-of-life management for renewable energy products.

## Brief description of the Access to Finance for Renewable Energy Technologies toolkit

The toolkit 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 instruments or schemes, are not addressed.

**Teaser:** Sets out the scope (you are here).

**How To Do Note:** Conceptualizes the key issues and provides specific guidance on the design and implementation of renewable energy finance projects.

**Lessons Learned:** Analyses past and current experiences in renewable energy finance, with a focus on implications for smallholders and their families.



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Brazil - Rural Sustainable Development Project in the Semi-arid Region of Bahia (Pro-Semiárido)

Some members of the Kiriri tribe look at a biodigester, built four years ago, at a home of one tribesman, at Aldeia Marcação Kiriri, near Ribeira do Pombal, in the state of Bahia, Brazil, on Tuesday, April 12, 2016. The system breaks down cattle manure and converts it into methane gas to be used as energy for cooking stoves. The byproduct is then used as fertilizer.

## Originators

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