

How to do

Access to finance for renewable energy technologies

Inclusive rural financial services



How To Do Notes are prepared by the IFAD's **Sustainable Production, Markets and Institutions Division** and provide practical suggestions and guidelines for country programme managers, project design teams and implementing partners to help them design and implement programmes and projects.

They present technical and practical aspects of specific approaches, methodologies, models or project components that have been tested and can be recommended for implementation and scaling up, including best practices and case studies that work and can be used as a model in a particular field.

How To Do Notes provide tools for project design based on best practices collected at the field level. They guide teams on how to implement specific recommendations of IFAD's Operational Policies, standard project requirements or financing tools.

The **How To Do Notes** are "living" documents and will be updated periodically based on new experiences and on feedback. If you have any comments and suggestions, please contact the originator:

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Acknowledgements

This toolkit has been prepared by Marion Allet and Kerman Wildberger of the Participatory Microfinance Group for Africa (PAMIGA) as a final outcome of the joint Responsible and Sustainable Growth for Rural Microfinance Project, under the supervision of Michael Hamp. We are grateful for all the efforts by the authors to make this toolkit happen. Thanks are due to the peer reviewers from IFAD: Guido Rutten, Karan Sehgal, Robert Delve and Kathy Zissimopoulos, and to Maria-Elena Mangiafico, who provided coordination support throughout the publication process.

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May 2018

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List of acronyms

BoP	base of the pyramid
FSP	financial services provider
MFI	microfinance institution
MSME	micro, small and medium enterprise
PAYG	pay-as-you-go
PV	photovoltaic
RE	renewable energy
RESCO	renewable energy services company
RET	renewable energy technology
TSP	technical solutions provider

Introduction

In the context of population growth, increasing inequality and natural resource depletion, universal access to energy – specifically to renewable energy (RE) – now has high importance on political agendas. Sustainable Development Goal 7 – Ensure access to affordable, reliable, sustainable and modern energy for all – sets two key targets in this regard:

- 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services.
- 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.

With great advances in the development of renewable energy technologies (RETs), the promise of universal access to clean, safe and affordable energy, in particular for remote rural populations, has never seemed so tangible. The development of local skilled expertise, local production capacities, distribution networks and after-sales services are instrumental to making RETs more widely available. Furthermore, as these technologies require some upfront investment, access to finance is a key component to facilitate their wider adoption.

In recent years, donors and financial services providers (FSPs) have increasingly invested in demonstration projects to facilitate access to financial services for RETs. Building on the lessons learned from these projects, the purpose of this How To Do Note is to provide guidance to IFAD country programme managers, project design teams, and implementing partners on how to develop financial services for access to RETs in rural areas. It focuses on end-user finance for individual/stand-alone RETs for rural households, smallholder farmers, and rural micro, small and medium enterprises (MSMEs); RETs for communities require very different types of financial instruments or schemes, so they are not addressed here. This note also provides specific recommendations for product design and project implementation.

Key issues

Energy is a key part of people's livelihoods. Access to affordable, reliable and sustainable energy is proven to be 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. Today, an estimated 1.2 billion people, around 16 per cent of the global population, do not have access to electricity (IEA, 2016). Among them, over 95 per cent are in sub-Saharan Africa and developing Asia, and around 80 per cent live in rural areas. Furthermore, over 2.7 billion people, representing 38 per cent of the world's population, still rely on the traditional practice of using solid biomass for cooking, using inefficient cookstoves or open fires in poorly ventilated spaces (IEA, 2016). Again, the majority of people living without clean cooking facilities are in sub-Saharan Africa and developing Asia, and in rural areas.

Owing to the lack of alternatives, these poor rural households usually rely on kerosene-based devices, candles or flashlights for domestic lighting. These energy sources place a financial burden on them, however: Lighting Africa estimates show that poor African households face recurring expenditures on fuel, ranging from 10 to 25 per cent of their monthly household budgets (IFC, 2010). Access to kerosene or batteries is often unreliable in remote areas and many poor households are unable to provide regular lighting for their children to study at home in the evening.

Moreover, the use of kerosene-based lighting devices, as well as solid biomass for cooking, is harmful to health, with chronic illnesses resulting from indoor air pollution and the risk of injury due to the flammable nature of the fuel used. It is estimated that nearly 2 million people die each year from pneumonia and chronic lung disease caused by using traditional fuels such as coal and wood for home cooking (GEF, 2018); the World Health Organization estimates that around 4.3 million deaths each year are due to illnesses attributable to the inefficient use of solid fuels for cooking (WHO, 2018). 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 also hinders the productivity and development potential of MSMEs in rural areas. Lighting Africa research shows that many African businesses close early in the evening because poor lighting creates a feeling of insecurity and prevents customers from staying out (IFC, 2010). Furthermore, supplying power to productive machines (e.g. milling machines) through diesel-based generators is very expensive: MSMEs that do so make only very limited profits on their activities, and the majority give up on the idea of using electrical machines that could improve their productivity. 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, though. Thanks to rapid technical progress, the price of such solutions has been falling significantly in recent years, especially for solar photovoltaic (PV) solutions. This makes them – at least in theory – more affordable for off-grid populations. RETs usually have a positive return on investment, as they replace more expensive, traditional sources of energy and, in case of productive use of the RET, can generate additional sources of revenue. The payback period, which varies according to the type of technology, the type and price of fuel replaced, and the possible productive use of the equipment, can range from as little as two months (for solar lanterns) to around four to five years (for larger productive RETs).

However, apart from small solar lanterns which are more affordable, the upfront cost of RETs remains a key issue for most rural households, smallholder farmers and entrepreneurs. Could access to finance for RETs help 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 RE solutions 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 of lighting). They can enable smallholder farmers to increase the area of their land that is irrigated, increase their yield, diversify their revenue sources (e.g. different crops, grain and fruit drying, cooling, storage, processing activities) and, through increased revenues, enhance their resilience to climate change and other shocks.

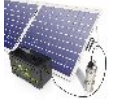
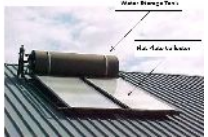


RE solutions can foster the creation and development of rural businesses, which can reduce their energy expenses and improve their productivity. RETs also improve access to information and communication (e.g. through charging mobile phones, radios, TVs), opening up new opportunities for rural populations in terms of access to markets and access to education, among others. In addition to these economic and social benefits, RE solutions have the advantage of increasing access to energy while reducing pressure on natural resources and the emission of greenhouse gases. Table 1 provides more details of the benefits of selected RETs.



Table 1. Examples of RE solutions and expected benefits

Type of RE solution ¹	Expected benefits
<p>Solar lanterns and pico-PV solutions 1-10 Wp² US\$10-US\$150 Lighting (1-4 lamps) Mobile phone charging</p> 	<p><i>For rural households:</i></p> <ul style="list-style-type: none"> ✓ More hours of lighting ✓ Better quality of lighting (brightness), especially for home study for children ✓ Reduced consumption of kerosene, as solar kits replace kerosene lamps ✓ Reduced indoor air pollution ✓ Reduced energy expenditure ✓ Better access to communication (e.g. mobile phone charging)
<p>Solar home systems/stand-alone PV systems 10-1,500 Wp or more US\$150-US\$6,000 Lighting Mobile phone charging Small electrical appliances (e.g. radios, fans, TVs, DVD players, clippers); refrigerators for larger systems</p> 	<p><i>For rural households:</i></p> <ul style="list-style-type: none"> ✓ Similar to solar lanterns ✓ Increased access to information and communication <p><i>For small rural businesses (e.g. grocery shops, small restaurants, small retailers, agrotourism):</i></p> <ul style="list-style-type: none"> ✓ More hours of lighting and electricity ✓ Better quality of lighting (brightness) and improved reliability of energy supply ✓ Reduced energy expenditure ✓ Increased revenues, thanks to reduction in energy expenditures, extended hours of business and/or improved productivity ✓ Diversification of income-generating activities ✓ More safety when working at night ✓ More comfort in the work environment (e.g. less noise than from diesel-powered generators)
<p>Solar hybrid systems (PV + diesel) 30,000-300,000 Wp or more US\$40,000-US\$250,000 Powering machines</p> 	<p><i>For rural businesses (food processing):</i></p> <ul style="list-style-type: none"> ✓ Reduced energy expenditures (compared to 100% diesel-powered generators) ✓ More power available ✓ More hours of power available ✓ Diversification of income-generating activities ✓ Increased productivity ✓ Increased revenues

¹ For more information on the different types of RE solutions, see: www.e-mfp.eu/actions-groups/microfinance-environment.

² Wp = Watt peak, a unit expressing the maximum electrical power that can be produced by a PV system under standard conditions of solar lighting and temperature.

Type of RE solution ¹	Expected benefits
<p>Solar water pumps 100-4,000 Wp or more US\$500-US\$20,000 or more Pumping water (especially for irrigation)</p> 	<p><i>For smallholder farmers:</i></p> <ul style="list-style-type: none"> ✓ Increased area of irrigated land ✓ Increased yields ✓ Diversification of crops cultivated ✓ Better climate resilience ✓ Reduced energy expenditure (compared to diesel-powered water pumps) ✓ Increased revenues <p><i>For dairy collection centres:</i></p> <ul style="list-style-type: none"> ✓ Reduced water and energy expenditure
<p>Solar water heaters US\$460-US\$1,050 for households (30 litres per person per day) US\$600-US\$7,000 for small businesses (e.g. hotels) US\$20,000-US\$40,000 for dairy collection centres Heating water</p> 	<p><i>For rural households and businesses (e.g. hotels, restaurants, dairy collection centres):</i></p> <ul style="list-style-type: none"> ✓ Increased amount of hot water available ✓ Better health and hygiene ✓ Replaces solid and fossil fuels ✓ Reduced household and small enterprise expenses
<p>Solar tunnel dryers US\$100 (portable mini-dryer) to US\$1,500 Drying grains or fruits</p> 	<p><i>For smallholder farmers:</i></p> <ul style="list-style-type: none"> ✓ Diversification of income-generating activities ✓ Reduced crop losses ✓ Better quality of dried grains/fruits ✓ Increased revenues
<p>Biogas digesters US\$500-US\$2,000 Cooking Lighting</p> 	<p><i>For rural households/smallholder farmers:</i></p> <ul style="list-style-type: none"> ✓ Reduced use of firewood and charcoal for cooking ✓ Reduced indoor air pollution ✓ Reduced energy expenditure ✓ More efficient organic fertilizer through use of biogas digester residue ✓ Reduced deforestation ✓ Reduced household labour ✓ Reduced risks (e.g. young girls are susceptible to sexual violence when collecting firewood) ✓ Reduced waste

Type of RE solution ¹	Expected benefits
<p>Micro-hydro systems US\$1,000-US\$20,000 Powering machines</p> 	<p><i>For rural businesses (e.g. milling, grinding):</i></p> <ul style="list-style-type: none"> ✓ Reduced energy expenditure, compared to diesel-powered generators ✓ More power available ✓ More hours of power available ✓ Diversification of income-generating activities ✓ Increased productivity ✓ Increased revenues
<p>Wind turbines For 1 kilowatt US\$4,000-US\$10,000 Powering machines</p> 	<p><i>For rural businesses (e.g. milling, grinding):</i></p> <ul style="list-style-type: none"> ✓ Reduced energy expenditure, compared to diesel-powered generators ✓ More power available ✓ More hours of power available ✓ Diversification of income-generating activities ✓ Increased productivity ✓ Increased revenues

Opportunities for entities providing end-user RE finance

There are two main categories of entities providing end-user financial solutions for individual RETs: (1) FSPs, as part of a diversified offer of financial products (see Box 1); and (2) technical solutions providers (TSPs) that distribute RETs and offer vendor finance solutions to their clients (see Box 2).

Opportunities for FSPs

For FSPs, getting engaged in RE financing could bring clear, strategic and financial benefits, such as:

- differentiating 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
- attracting new sources of funding.³

Additionally, FSPs with a social mission will be driven by the positive economic, social and environmental impacts that can be expected: By facilitating access to RE, they could contribute to improving the living conditions of their clients and foster local economic development (Allet, 2014; Levai, Rippey and Rhyne, 2011). For IFAD's partner FSPs, engaging in RE financing would contribute to improving their ratings in terms of Social, Environmental and Climate Assessment Procedures.

³ Similar to findings from Allderice and Rogers, 2000; Allet, 2014; and Levai, Rippey and Rhyne, 2011.

Box 1. Examples of financial solutions offered by financial service providers (FSPs)

Loans

The most common and evident financial solution to invest in a renewable energy technology (RET) is through a loan. There is no one-size-fits-all, standardized loan product for renewable energy (RE) financing, but rather a variety of financial solutions adapted to local contexts. They can be provided as group loans, individual loans, stand-alone loans, parallel loans, top-up or bundled loans, and short- and medium-term loans, among others.

Programmed savings accounts

Another financial option, although one that is less frequently adopted, is offering programmed savings accounts dedicated to clients who want to build their savings progressively with the objective of investing in a domestic or productive asset, such as a RET. Programmed savings accounts can be used to invest in a RET or to build the cash collateral needed to apply for a RE loan. When opening an account, the client has to define the target amount that they want to save (equal to the planned investment cost), the duration of the savings plan, and the monthly deposits that they will make. The savings product gives the client the flexibility to define at the start their own target amounts (final amount plus monthly deposits) and to choose between various durations. These commitments are specified in the contract signed by the client with an FSP, and then act as an incentive for disciplined saving.

Box 2. Examples of financial solutions offered by technical solutions providers (TSPs)

Pay-as-you-go

Pay-as-you go (PAYG) is a technology that allows end-users to pay for renewable energy (RE) in small digital instalments. It has been increasingly used in the past decade to facilitate access to solar energy in particular.

After making a down payment, the customer's RE device is installed. To be able to use it, the customer needs to make regular payments, either through mobile money technology 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 made.

Most PAYG systems use a lease-purchase model, where the solar device gets permanently unlocked after a certain payment level is reached. Furthermore, PAYG technology often includes a system for remote monitoring and detection of any defects, which improves the efficiency of after-sales services.

Some TSPs offering this financial solution include M-KOPA Solar, Azuri Technologies, Mobisol, PEG Ghana, Simpa Networks, Fenix International, SunTransfer, Greenlight Planet, Fosera, Pollinate Energy and Kamworks.

Energy as a service

Customers do not purchase the technology itself, but rather pay for the service provided by the RET in terms of access to energy. For small solar solutions, selling energy as a service is done through battery charging (e.g. clients purchase a battery-powered lamp and regularly pay a local entrepreneur to charge the battery with solar power) or through the rental of solar lanterns (this model is used by HERI Madagascar).

For larger systems, especially those used by MSMEs, another financing option is to contract a renewable energy services company (RESCO). With this system, the customer does not buy the RET, but rather provides roof space for a TSP to install solar panels and subsequently pays the RESCO for the electricity generated. Depending on the type of RESCO agreement, the customer either pays for electricity (leasing construction) or slowly pays off the installation costs as well.

Opportunities for TSPs offering financial solutions

For companies commercializing RETs, developing their own financing solutions could bring some key benefits, such as:

- significantly expanding outreach to lower-income customers and rural areas
- differentiating themselves from competitors
- avoiding reliance on external partners such as FSPs.

Challenges

Despite such opportunities, access to RE finance still remains limited, and there are significant challenges that constrain its expansion.

Dependence on the RET supply chain

Financing RE solutions implies that adaptable, high-quality RE solutions and all related customer services are available on the local market. Even though the RET sector has developed rapidly in recent decades, supply chains do not have the same level of maturity in all countries and may still present significant weaknesses:

- **Lack of RE solutions to meet demand.** Great technological progresses have been made in recent years, providing RE solutions that perform well and are efficient, affordable and respond to a wide variety of needs. However, not all RETs are available everywhere and not all RETs can cover all types of needs. For example, rural entrepreneurs willing to invest in RE for milling or grinding may not find a RE solution adapted to their needs: solar will usually be much too expensive to provide the required capacity, while micro-hydro systems or wind turbines may not be adapted to areas with limited water or wind resources. Additionally, many promising technologies linked to agriculture-related productive use are still at a prototype level and not ready yet for wider distribution.
- **Lack of physical presence in rural areas.** Distributors of RE solutions are usually based in urban or peri-urban areas and do not always reach out to more remote rural areas, where needs are most acute: the “last mile” problem. Rural populations, even if they have heard of some solutions, do not know where to get them, or find it too complicated to go to larger cities or markets. Furthermore, there is a clear lack of customer services at the last-mile level: no easily accessible technicians to help with installation, educate clients on good operation and maintenance, or provide after-sales services. Rural clients are often left on their own and do not know what to do in case of problems with their RET. When basic customer services are not properly provided, there are clear risks that clients are not satisfied (because delays in handling after-sales services are too long, because they lack information on how to use their technology, etc.) and that RETs break down rather quickly (e.g. through misuse and/or a lack of maintenance). As a result, many breakdowns are not fixed, which directly affects the rural clients who have invested money in such solutions.

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. For example, low-income rural people sometimes believe that solar energy does not work at night or during the rainy season; they may think that RE can only supply small lanterns, not larger machines; they sometimes assume that RETs are only adapted to the needs of rich people or that they are complex to manage. A lack of information on RETs (e.g. their functioning, uses, capacities, limitations, maintenance, payback periods) 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.



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Ecuador - Upper Basin of the Cañar River Rural Development Project

Competition by low quality, cheap solutions

In places where RETs are more easily found on local markets or nearby towns, people are confronted with regular problems of quality, such as counterfeit solutions and low-quality equipment with no warranty. Clients are often attracted by low prices, but can end up with solutions that break down very quickly. Bad experiences with low-quality solutions can lead to significant distrust in RETs in some countries.

Inadequate policy frameworks

In 2013, subsidies for fossil fuels amounted to an estimated US\$548 billion (IEA, 2014). Such levels of national subsidy, quite obviously, strongly deter RET companies from entering rural markets where transaction costs are high. Many countries also still lack conducive policies, such as net metering and feed-in tariffs. In the absence of such regulations, many rural communities expect that they will soon be connected to the electric grid, which hinders investments in RETs.

High-risk perception from FSPs

FSPs often perceive RE lending as high risk, especially in terms of credit risk and reputational risk. The quality of a RE loan portfolio is directly related to the level of satisfaction of clients with their equipment. Because of all the challenges mentioned (e.g. low awareness levels, commercialization of low-quality solutions, a lack of presence of TSPs in rural areas), the risk that customers are not happy with their RE equipment appears to be high – either because the RET does not fulfill expectations or because it is not working properly (due to defect, misuse, lack of maintenance services, etc.). Consequently, FSPs are often reluctant to engage in the RE sector.

Limited capacity of RE companies to provide payment solutions

Developing vendor finance solutions, such as PAYG, requires RE companies to build internal competences related to credit management (e.g. scoring/appraisal, monitoring, recovery), either by recruiting qualified staff or training current employees on financial aspects. If they opt for digital payments through a PAYG approach, they also need to invest in the necessary hardware, software and platform development, as well as develop partnerships with mobile network operators. Engaging in vendor finance would also imply a change in mindset: The company will no longer just look at sales volumes, but will also have to manage portfolio quality. Finally, selling RETs on PAYG or as a service (e.g. renting, battery charging, RESCO) also implies pre-financing of the 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: at the management level, in order to make informed decisions in terms of product choice and partnership strategies; and at the field staff level, in order to be able to answer the most frequent questions asked by their customers regarding RETs. It implies engaging resources to build partnerships and ensure coordination with RE solution providers. It also requires having enough funding available to finance a new type of portfolio. Many FSPs are not always in a position to develop such innovative financial products. This could be because they have not reached financial self-sufficiency and are constrained in terms of human and financial resources; or because they are engaged in other innovation processes more essential to their business (e.g. digitalizing, savings mobilization); or they are facing crucial challenges (e.g. fraud cases, portfolio degradation, economic shocks), as they work in highly volatile environments.

Lessons learned

Experimentation with access to finance for RE has resulted in significant lessons learned on what works and what does not work well. Key lessons are presented below; more details are available in IFAD's Lessons Learned Note on Access to Finance for Renewable Energy Technologies.

Strengths

- **Field experiences are developing and contributing to the identification of good practices.** A growing number of experiences are being gained, with a variety of models being tested: from FSPs setting up partnerships with TSPs (the “two-hand model”) to TSPs developing their own financial solutions (e.g. PAYG, energy as a service) and FSPs creating their own subsidiary for RET distribution and financing. The 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 that of Grameen Shakti (Bangladesh) or M-KOPA Solar (East Africa) confirm the high potential of RE finance. Knowledge of good practices is also growing thanks to the increasing number of publications from practitioners on lessons learned from 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 livelihoods of end-users, such as a reduction in energy costs, improvements in living conditions, and a reduction in indoor air pollution. Many studies also show that RETs used by households for domestic purposes bring economic benefits to clients, as they substitute other traditional, costly sources of energy (such as kerosene lamps, flashlights and diesel-based generators). At the farm level, RETs are increasingly being seen as a potential economic driver for rural enterprise development, such as for production, processing and post-harvest activities (i.e. drying, cooling, storage).

- **There is demand for involvement by FSPs.** This demand comes first from RET providers, which see various advantages in building partnership 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 up access to a new clientele and facilitating marketing and distribution, thanks to the FSP networks of rural branches. Demand for FSPs' involvement also comes from rural clients themselves. In rural areas where FSPs have developed close relationships with their clients, it is common for rural communities to ask their FSP for assistance in accessing a RE solution, as well as receiving orientation from the FSP regarding the type of RET they should choose.
- **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, and the potential risks involved.
- **There are ways to stimulate demand.** For example, 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 target clients. Experience shows 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 the rural “base of the pyramid” (BoP) populations. Various FSPs have opted for offering “top-up” or “bundled” loans, in which the client has the possibility of adding a RE solution to its 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 RE 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.

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. Even though a growing number of actors are engaging in RE finance projects, the majority seem to remain at a pilot phase, with only a few hundred RE 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 managing project-level risks.
- **Weaknesses in the rural finance and RE sectors.** In many countries, the lack of maturity of the RE supply chain (e.g. limited 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. On the other hand, RE providers that are looking for partner FSPs can face difficulties in finding adequate partners due to the lack of presence of solid FSPs in rural areas and their limited resources and capacities. The uneven development of digital finance also hinders the development of PAYG solutions. And, in some cases, inadequate subsidized schemes distort the local market, crowding out private sector actors like TSPs and FSPs.

- **Complex, multistakeholder projects.** The development of a RE portfolio is usually the result of complex, multistakeholder partnerships. These stakeholders may decide to collaborate along similar objectives (e.g. improving access to RE solutions for low-income populations). However, their visions may differ greatly: where some stakeholders (e.g. TSPs) see opportunities, others (e.g. FSPs) may see risks. These antagonistic approaches can make it difficult for the partnership to succeed. Experience shows that building trustful and strong partnerships between TSPs and FSPs is a long-term process, and that having a facilitator is key to 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 upgrading of technical solutions, the offers of RE providers are constantly evolving. For FSPs engaging in RE finance, keeping pace with RE innovations is critical to meeting demand and remaining competitive. However, FSPs and TSPs offering finance for good-quality certified solutions still face uneven competition from low-quality solutions because of the general lack of standards and control for RET quality.



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China - West Guangxi Poverty-Alleviation Project
A stagnant pond in Rongpeng village generates biogas to provide energy to rural homes, Dujie town, Longan county, West Guangxi, China.

Guidance on design and implementation

Preconditions for IFAD support to end-user 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 financial solutions for access to RETs. Prior to supporting a project, IFAD's project design teams should collaborate with stakeholders, including potential providers of RETs and FSPs, to evaluate the overall landscape for RE financing (Figure 1). This assessment should inform IFAD and its partners about demand and supply, as well as the institutional, regulatory and business environments. A thorough analysis of these multiple dimensions will ensure an appropriate match between demand and supply under the right conditions.

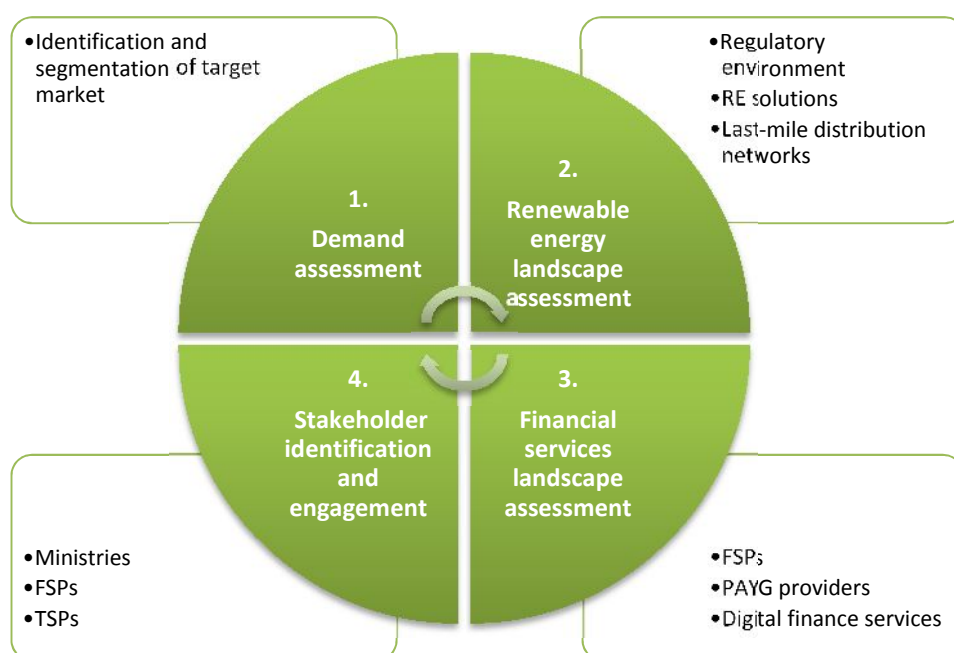


Figure 1. Preconditions for IFAD's engagement and support

Step 1. 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 a successful uptake and use of both RE and financial solutions.

- **Market segmentation.** To better identify the variety of needs and aspirations, the first step is to segment the target market by the type of use of energy:
 - Domestic use by rural households
 - Productive use by smallholder farmers
 - Productive use by rural businesses (which then needs to be further segmented by type and size of business).

- **Needs assessment.** More in-depth needs assessment are then needed to determine:
 - Current access to energy (e.g. on-grid or off-grid, which sources, which uses, which equipment, how many hours per day, when, level of energy expenditure)
 - Level of satisfaction with current access to energy
 - Aspirations/expectations related to access to energy (e.g. why, for which uses, for which equipment, how many hours a day)
 - Level of knowledge and perceptions of RE (e.g. types of solution, previous experience, accessibility of technical solutions used so far, perceptions on quality and price, level of confidence, possible misperceptions)
 - Willingness to invest in a RE solution, specifying the preferred solution
 - Capacity to pay for such RE solutions (e.g. savings, sources of revenues, cash flow structure)
 - Potential constraints to investing – financial, as well as logistical or cultural – taking into account seasonality
 - Willingness to take a loan to invest in a RE solution
 - Potential conflicts with other financial needs
 - Current access to financial services
 - Current access to mobile phones/digital technologies
 - Current access to and use of digital finance
 - Aspirations/expectations related to financial services.

Results coming from on-grid and off-grid populations should be analysed separately, since their needs and aspirations are likely to greatly differ. This information can help to pinpoint the types of RE solutions and related financial services that would be most easily taken up by target rural populations.

- **Market sizing.** Calculating the potential size of the market is a necessary exercise for project planning, as well as for developing a business case. A combination of field-based market research – consisting of focus groups and in-depth interviews with rural households, smallholder farmers and rural businesses – and a review of public or private surveys and other statistics can shed light on the characteristics and size of the target market.

Step 2. RE landscape assessment

The RE sector has grown significantly in the past decade. However, the level of maturity of the RE supply chain varies greatly from one country/region to another. Mapping the RE landscape is essential to gauge the feasibility, viability and scalability of a RE finance project. This mapping should include an assessment of the regulatory environment, the available RE solutions, and the potential distribution networks in rural areas. IFAD will need to collaborate closely with regulators, ministries of energy and TSPs to obtain the information needed to conduct this assessment.

Key points to consider include:

- **Public policies and regulations.** Public policies and regulations can play a key role in either supporting or hindering the development of the RE supply chain, as well as the offer of finance for RE solutions. Ensuring that there is an enabling environment is essential before initiating an energy finance project. The following issues should be looked at:
 - Are traditional sources of energy (fossil fuels) subsidized? Is there a risk of market distortion preventing the development of the RE supply chain?⁴
 - Are customs regulations favourable to the import of RETs? Are imported RETs tax-exempt? Are customs clearance processes reasonably short and simple for TSPs?
 - Are there quality certification requirements for RETs distributed over the national territory? Are they properly enforced? Do they succeed in preventing the proliferation of low-quality RETs on the local market? Are the procedures for getting such certification clear, accessible and efficient?
 - Are there public financial incentives for the purchase of RETs? For whom? Under which modalities? Are they effectively implemented?
 - Are there large-scale programmes for the fully or highly subsidized distribution of RETs? Is there a risk of market distortion, preventing the development of private sector initiatives/more commercial approaches and therefore hindering the development of the RE supply chain and RE finance solutions?
 - Are there any effective guarantee fund mechanisms or other risk mitigation instruments aimed at engaging FSPs and/or TSPs in energy financing?
- **Availability of RETs.** There are a wide range of RE solutions available on the market today, but they differ greatly in terms of quality, service, relevance, etc. When financing such energy solutions, portfolio quality directly derives from the end-users' satisfaction with the technologies. Ensuring adapted RETs are available on the local market is critical before engaging in an energy finance project. In particular, the following aspects should be assessed:
 - Do the available RETs fit the needs and expectations of target segments?
 - Are they easy to install, use and maintain?
 - Is the price affordable to target segments, directly in cash or through a loan?
 - Cost-benefit analysis: Do the RETs bring clear economic and social benefits to end-users? Do they have a positive return on investment for customers? Is the payback period reasonable, in particular in relation to the lifespan of the solution?
 - Have they passed national or international quality certification requirements?
 - Do they come with a sufficient warranty (working under which conditions)?
 - Are spare parts available on the local market? Is it possible for a client to replace only one part of the technology instead of having to replace the whole solution?

⁴ This risk was identified as a key bottleneck for the IFAD Adaption to Climate Change in the Mekong Delta in Ben Tre and Tra Vinh Provinces in Viet Nam, where the high level of fossil fuel use makes it difficult for RET companies to enter the market.

- **Last-mile distribution networks.** In many countries, there tends to be a growing number of companies involved in the design, assembly, distribution, installation and maintenance of RETs. However, most of these TSPs are primarily focused on urban areas and/or high-end segments (e.g. medium and large enterprises, public entities). Only a few venture into rural areas and BoP segments. A lack of physical presence and customer services at the last mile can directly threaten the sustainability of a RE finance project. Assessing the presence of RE distribution networks in rural areas is therefore essential. Issues to be explored include:
 - Are there TSPs aiming to reach rural populations/already serving rural populations?
 - Do they have decentralized stocks of RE solutions?
 - Do they have shops or outlets in rural areas?
 - Do they have local agents (e.g. sales agents, technicians) based in rural areas? How many? Where? What profiles? How long have they been operating?
 - Do they have the experience and capacity to market their products in rural areas?
 - Do they offer fast, efficient, reliable and easy-to-access after-sales services in rural areas?

Step 3. Financial services landscape assessment

Evaluating the coverage of formal and informal financial services in rural areas is critical for identifying 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. Assessment should include:

- **Availability of FSPs in rural areas.** Banks often tend to be absent from rural communities, but other types of FSPs, such as savings and credit cooperatives or microfinance institutions, may already operate. Although it is likely that most of them do not offer specific financial products for access to RE, they might provide some types of equipment loan or asset finance solutions to rural populations. The assessment should determine the geographical coverage of such rural FSPs, as well as the array of financial products and services that they offer.
- **Availability of vendor finance and PAYG solutions in rural areas.** FSPs are not the only providers of RE financial solutions in rural areas. In recent years, a growing number of RE companies have decided to provide financing solutions to their customers directly, in particular through PAYG technologies. This is particularly visible in East Africa. The landscape assessment needs to take into account possible vendor finance and PAYG solutions, evaluate their geographical coverage, their accessibility to low-income rural communities (e.g. eligibility criteria), as well as their features.
- **Availability of digital finance services in rural areas.** Another key aspect to look at is to what extent digital finance services (e.g. mobile payments) are already available and adopted in rural areas. The use of these services can greatly facilitate the development of rural financial services, and more specifically of PAYG solutions.

Step 4. 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.** These might be savings or credit cooperatives, credit unions, microfinance institutions or banks that are already serving rural clients. IFAD should make sure that the FSP's decision to engage in RE finance is based on a long-term commitment and aligned with the vision and strategic plan of the FSP. Developing RE financial services requires patience and willingness to mobilize human and financial resources to make it work. FSPs with previous experience in innovative financial services and multistakeholder projects may be in a better position to implement such projects.

- **TSPs that are willing to partner with FSPs or develop their own financial services.** These might be companies that design, manufacture and commercialize their own RE solutions, or local distributors. IFAD should ensure that the TSP has a strong commitment to exploring the BoP market, and/or to offering products and services in rural areas. This implies not only delivering RE products in rural areas, but also conducting marketing activities and ensuring all customer services (i.e. installation, client education on the proper use and maintenance of the RE solution, after-sales services). Providing high-quality services at the last-mile level is critical to the success of RE finance projects, but it is also complex and challenging, and requires the mobilization of adequate resources before the first returns can be expected. Many TSPs can offer quality RE solutions, but only a few have the necessary long-term commitment to venture successfully into the rural BoP market. Furthermore, in the case of partnerships with an FSP, the TSP should be ready to provide technical training to the FSP staff on RETs, to develop co-branded marketing materials, and to coordinate closely with FSP staff for all customer-related activities.
- **Service providers, such as non-governmental organizations and public bodies.** These provide support services, including general awareness-raising on RETs, capacity-building to FSPs and TSPs, and facilitation for the development of partnerships. The availability of financing for such activities is key to ensuring that these stakeholders will remain engaged in a RE finance project.

Guidance for FSPs on the design of financial products

For an 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 already works well, and identify which features (in terms of characteristics and procedures) need to be adapted to fully fit the specificities of RE financing. For that purpose, we recommend that FSPs: (1) adopt a client-centric mindset; (2) use a risk management approach; and (3) align with client protection principles.

Even though this advice is primarily formulated for FSPs, it can also guide, to a large extent, RE companies willing to develop their own financing solutions for target customers (e.g. through PAYG technology).

Adopt a client-centric mindset

Similar to any other type of product development, it is essential to keep target clients at the centre of the whole design process. Beyond the needs assessment – which is key to identifying clients' needs, aspirations and concerns – a good practice is to apply a “human-centred design” approach (as recommended by the Consultative Group to Assist the Poor). This design process actively engages target users to find solutions to their needs. It could involve several quick iterations, or “rapid prototyping” (Mattern and Tarazi, 2015), until the features of the products are fine-tuned. As for any other financial product, there is no “one-size-fits-all” RE finance solution; preferences for certain features may vary greatly according to the target segment and context of operation. Issues to consider include:

- Do target clients prefer to “freely” choose their RE solution and provider on the local market, or do they feel more comfortable if the FSP has set partnerships with selected TSPs?
- Do target clients prefer to get a top-up or bundled loan, where RE financing is added to their business/agriculture loan, making application and repayment processes easier? Or would they prefer a separate loan, which gives them more flexibility in terms of the application date?
- Do target clients prefer to have the RE solution directly delivered to their place of work, or to their FSP branch? Or do they want to receive a voucher from their FSP and pick up their RE solution at the TSP shop themselves?

A client-centric design process can help to ensure that the features of the products and services will adequately respond to the needs and aspirations of target clients, which is crucial to ensure uptake.

Use a risk management approach

Finance for RE entails a number of risks. Some may be similar to other financial products already offered by the FSP, but others may be very specific to the RE sector. A good practice in the design of financial products is to take a risk management approach. This can be done in a participatory way, by gathering FSP managers and selected field staff for a product design workshop. The workshop should follow three steps:

1. **Identify the specificities of a RE financial product:** What makes it different from other financial products already offered by the FSP?
2. **Identify the risks that can be associated with these specificities** (e.g. credit risk, reputational risk, operational risk, liquidity risk, financial risk) and through which mechanisms or causal links.
3. **Consider the possible mitigation solutions** for each of these risks.

The characteristics and procedures linked to the RE financial product can then be adapted by integrating the identified mitigation solutions.

Table 2 displays some of the specificities, risks and mitigation solutions that can be identified when designing a RE loan product. This should not be taken as mandatory, nor as exhaustive, but as “food for thought” to be adapted to the local context when engaging in RE loan product design.

Table 2. Risks associated with RE finance and possible mitigation solutions

Specificities	Risks	Examples of mitigation solutions (to be adapted to local contexts)
RE loans are linked to equipment/new technology	<p>Credit and reputational risks</p> <ul style="list-style-type: none"> ▪ Credit and reputational risks if the client is disappointed with the technical solution. ▪ Risk of default and reputational risk if the equipment: <ul style="list-style-type: none"> does not work; breaks down because it is of poor quality, or because it has been misused by the client; cannot be repaired because it is too costly, spare parts are not available, or after-sales services are not available. ▪ Risk that the client will not take good care of the equipment because it is bought on credit, and that they will default if the equipment breaks down. ▪ Risk of default if the equipment is stolen. 	<ul style="list-style-type: none"> ✓ Ensure that you promote technologies that are adapted to local needs and local culture. ✓ Have demonstration kits at branch offices. ✓ Raise clients' awareness of the capacity, functioning and limitations of the technology. ✓ Allow only the financing of energy solutions that are certified (international and/or national standards), that come with a warranty, and for which spare parts can be accessed. ✓ Set up partnerships with TSPs that have been carefully selected along rigorous criteria: capacity to have a stock of spare parts, capacity to handle the warranty process, capacity to provide high-quality customer services in rural areas, etc. ✓ Sign clear partnership agreements with these distributors to formalize their commitments. ✓ Disburse the loan “in kind” to the client to avoid misuse of funds: use models in which the FSP pays the selected TSP directly, which then delivers the energy solutions to the client. ✓ Raise clients' awareness of the good use of the equipment (e.g. through demonstration sessions, training, distribution of user guides). ✓ Raise clients' awareness of the existence of a warranty, its modalities of functioning, and how to access after-sales services. ✓ Do not provide a loan for the full amount of the material, but rather for 70-90 per cent of the cost. Ask for a personal contribution of 10-30 per cent, for instance, so that the client feels ownership and takes good care of the equipment.

Specificities	Risks	Examples of mitigation solutions (to be adapted to local contexts)
	<p>Operational and reputational risks</p> <ul style="list-style-type: none"> ▪ If loans are disbursed directly to a partner TSP, there is a risk of clients' complaints if the technical solutions are not quickly available, or if the loan starts before the technical solution is delivered or installed by the TSP. ▪ Risk of competitors, or competing programmes that may divert clients from the FSP. 	<ul style="list-style-type: none"> ✓ Strengthen the energy supply chain's capacity to handle marketing, delivery, installation and after-sales services at the local level, in rural areas (e.g. by financing last-mile agents). ✓ Do not take the energy solution as the sole collateral for the loan: clients may refuse to repay their loan when the energy solution is broken; in this case, seizing it as collateral does not have any significant value, be it in terms of pressure or financial value. <hr/> <ul style="list-style-type: none"> ✓ Only start the repayment schedule and interest charging on the day the client is in possession of their energy solution. ✓ Sign a partnership agreement where the TSP commits to a maximum delay for delivery or installation of the solution (possible to define late penalty fees). ✓ Have a strong marketing strategy: make sure that sales agents communicate on the advantages of the proposed energy solutions (e.g. good quality, warranty, after-sales services, availability of spare parts).
<p>RE loans may be for domestic use, not productive use</p>	<p>Credit and reputational risk</p> <ul style="list-style-type: none"> ▪ Risk that the investment will not increase clients' repayment capacity, or will contribute to over-indebtedness because of its consumption use. 	<ul style="list-style-type: none"> ✓ Allow only the financing of energy solutions that either generate income (productive use of the energy solution) or generate savings (domestic use of the energy solution, replacing a more costly energy source). When selecting the energy technologies to be promoted, assess their returns on investment and payback period on the basis of the additional revenues and/or savings that they can generate. ✓ Tailor the instalment amounts to the savings on energy expenditures generated by the technology during a certain period of time. ✓ Strengthen the loan demand analysis on capacity to pay by conducting a detailed cash flow analysis (taking into account all households revenues and expenditures), checking the level of indebtedness and verifying the adequacy of collaterals. ✓ Do not provide a loan for the full amount of the material, but rather for 70-90 per cent of the cost. Ask for a personal contribution of 10-30 per cent, for instance, so that the client demonstrates his/her capacity to pay and so that the credit risk is reduced. ✓ Provide the energy loan in addition to a productive loan, provided the client has the capacity to repay both loans or a bundled loan. ✓ Develop a marketing strategy focusing on the productive use of energy. ✓ Organize financial education sessions so that clients learn how to better manage their debts thanks to savings made by the energy solution.

Specificities	Risks	Examples of mitigation solutions (to be adapted to local contexts)
<p>RE loan amounts may be high</p>	<p>Credit risk</p> <ul style="list-style-type: none"> ▪ Risk that the client will not have the capacity to repay a large amount. 	<ul style="list-style-type: none"> ✓ Define eligibility criteria that are stricter than for smaller loans: only for existing clients with a minimum history with the microfinance institution (MFI), who have already repaid a loan, have at least “x” number of cycles with the MFI, have no history of default, etc. ✓ Do not provide a loan for the full amount of the material, but rather for 70-90 per cent of the cost. Ask for a personal contribution of 10-30 per cent, for instance, so that the credit risk is reduced. ✓ For energy loans that exceed a certain amount, do not allow any parallel loan. ✓ Strengthen the procedures for credit analysis: conduct detailed cash-flow analysis, assess returns on investment, check levels of indebtedness, validate loan applications at several levels according to their amount, etc. ✓ Ask for a diversity of collaterals, such as cash, a personal guarantor, non-traditional material guarantees (e.g. furniture, jewels, machines, cattle). When opting for collaterals, take into account transaction costs in checking the goods (e.g. ownership, value), ease of procedure enforcement, market price, psychological pressures, need to diversify, etc. Make sure that, in total, all collaterals will be sufficient to cover the risk. Include the energy solution in the list of collaterals, but only for a percentage of its market value and never as the sole collateral (loss of value in case of breakdown). ✓ Train clients on debt management.
	<p>Liquidity risk</p> <ul style="list-style-type: none"> ▪ Risk that the FSP does not have the funding to disburse high amounts and meet demand. 	<ul style="list-style-type: none"> ✓ Mobilize funding through savings, loans, etc., and potentially through carbon credits. ✓ Limit the proportion of energy loans in the portfolio and/or the number of branches offering energy loans, according to available resources; adapt the marketing strategy accordingly.
<p>RE loan durations may be too long</p>	<p>Credit risks</p> <ul style="list-style-type: none"> ▪ Risk that the client “forgets” about their commitment in the medium term. ▪ Risk that the credit becomes too expensive for the client over the long term. 	<ul style="list-style-type: none"> ✓ Do not ask for <i>in fine</i> repayments, but rather for regular instalments (monthly, quarterly). ✓ Develop a specific repayment schedule adapted to the seasonality of incomes. ✓ Provide the client with a written version of the repayment schedule (e.g. calendar, booklet). ✓ Remind the client about upcoming instalments (e.g. by letters, phone call, text message). ✓ Decide on the loan duration according to the repayment capacity of the client for each instalment (cash-flow structure). ✓ Revise the interest rate for medium-term loans so that it remains affordable (e.g. declining balance rather than fixed rate). ✓ Do not provide a loan for the full amount of the material, but for 70-90 per cent of the cost (ask for a personal contribution), which will reduce the cost of the loan. ✓ Organize financial education sessions so that clients learn how to better manage their revenues and debts over time.

Specificities	Risks	Examples of mitigation solutions (to be adapted to local contexts)
	<p>Liquidity risk</p> <ul style="list-style-type: none"> ▪ Risk that the FSP does not have the medium-term resources needed to meet demand. 	<ul style="list-style-type: none"> ✓ Mobilize medium-term funding (through savings, loans, etc.). ✓ Define the maximum loan duration according to available resources. ✓ Limit the proportion of energy loans in the portfolio and/or the number of branches offering energy loans according to available resources; adapt the marketing strategy accordingly.
<p>RE loans are new financial products</p>	<p>Operational and reputational risks</p> <ul style="list-style-type: none"> ▪ Risk of procedural errors due to the learning process. ▪ Risk of inadequate messages provided to clients due to the learning process (in particular regarding energy technologies, warranties, etc.). 	<ul style="list-style-type: none"> ✓ Appoint an “energy champion” within the institution to provide training and support to branch managers and field staff. ✓ Start with a limited number of RETs to facilitate learning for field staff. ✓ Train staff on both the RETs (e.g. basic knowledge to answer clients’ questions) and the new financial product and procedures. ✓ Organize progressive training to avoid providing too much information at one time. ✓ Organize regular refresher training sessions. ✓ Include quizzes and role plays during staff training to check if key procedures and messages have been well understood and assimilated. ✓ Select only specific loan officers in charge of energy loans; specialized staff.
	<p>Operational risk</p> <ul style="list-style-type: none"> ▪ Risk of a lack of motivation from field staff regarding the new financial product because it is perceived as more complex and time-consuming, or because they do not see the benefits for themselves and the FSP. 	<ul style="list-style-type: none"> ✓ During staff training events, explain why the FSP decided to offer energy loans, what it brings to clients, to the branch, and to the whole institution. ✓ Involve field staff at all stages of the development of the new financial product: get their inputs and feedback on the characteristics, procedures, marketing strategy, etc. ✓ Set clear objectives for energy loans, per officer/branch, and follow up on performance. ✓ Set up an adapted incentive system: through non-financial incentives (e.g. a competition for the best energy loan officer) or financial incentives (integrated into the existing system). ✓ Balance the distribution of tasks between loan officers and energy solution distributors.
	<p>Operational risk</p> <ul style="list-style-type: none"> ▪ Risk of bad coordination/miscommunication with partner TSPs, resulting in delays, errors or tensions between partners or even clients. 	<ul style="list-style-type: none"> ✓ Clearly define procedures (step by step) that describe the relations between the MFI and the energy solution distributors (e.g. flow of information, distribution of tasks); have them formalized in a written memo. ✓ Appoint focal points within each partner organization: an energy champion within the MFI and a contact person within the energy solution distributor. ✓ Organize regular coordination meetings/workshops. ✓ Organize exchange visits to help partners better understand each other.

Specificities	Risks	Examples of mitigation solutions (to be adapted to local contexts)
	<p>Operational risk</p> <ul style="list-style-type: none"> ▪ Risk of inadequate/insufficient/badly timed marketing to launch the new product, resulting in very low demand from clients. 	<ul style="list-style-type: none"> ✓ Develop a specific social marketing approach. ✓ Be active in promoting the new product to make it known to potential clients. ✓ Hold discussions with a sample of clients and loan officers to determine favourable periods for promoting the energy loan, and plan marketing and prospection activities accordingly.
	<p>Financial risk</p> <ul style="list-style-type: none"> ▪ Risk that marketing, training and monitoring activities end up being costlier, and that interest and fees charged do not cover these costs. 	<ul style="list-style-type: none"> ✓ Plan to subsidize or cross-subsidize the initial costs of developing and launching the new financial product. ✓ Start with a pilot phase. ✓ Track the performance of the energy loan product (e.g. through a separate Management Information System report) and make adjustments to improve financial performance as necessary.

Align with client protection principles

According to the Smart Campaign,⁵ client protection principles are the “minimum standards that clients should expect to receive when doing business with a microfinance institution”. Within the microfinance industry, there is a consensus that FSPs should adhere to these core principles (see Box 3). All of these principles need to be kept in mind when designing a RE financial product. Two of them deserve to be specifically pinpointed:

- **Transparency.** Investing in a RE solution may involve some hidden costs, such as the cost of installation, as well as expected future operating expenses (e.g. replacement of the battery, maintenance). Transparent communication on what is and is not included in the price of the RE solution, and thus in the loan amount, is critical. Furthermore, there needs to be clear communication on the pricing of the financial product itself. If FSPs today tend to better communicate about fees, interest and effective interest rates applied, this is not yet the case for PAYG providers. This lack of transparency on pricing can be prejudicial to clients.
- **Mechanisms for complaint resolution.** When financing RE solutions, portfolio quality is directly derived from the level of end-users’ satisfaction with the technologies. If the RE solution does not match the expectations of the client or stops working, there is a high risk that the client will stop repaying their loan. It is crucial to have easy-to-use and efficient mechanisms for complaint resolution in place. Setting up such mechanisms will usually require close coordination between the partnering FSPs and TSPs.

Box 3. Smart Campaign’s client protection principles

- Appropriate product design and delivery
- Prevention of over-indebtedness
- Transparency
- Responsible pricing
- Fair and respectful treatment of clients
- Privacy of client data
- Mechanisms for complaint resolution

Source: Smart Campaign (2017).

⁵ The Smart Campaign is a global campaign committed to embedding client protection principles into the institutional culture and operations of the microfinance industry.

Guidance on implementation for IFAD design teams and project management units

Build the capacities of FSPs and PAYG providers

One of the main roles IFAD can play in supporting the development of RE finance for rural populations is building the capacities of FSPs and PAYG providers. This is a critical role, given the lack of experience of FSPs in the RE sector and an overall reluctance to engage in RE financing, as well as the lack of experience of PAYG providers in the design and management of financial products.

FSPs in particular could benefit from guidance and support to:

- develop a long-term business plan and financial projections for offering RE financial products in rural areas
- identify and select adapted, high-quality RETs and reliable TSPs to partner with
- define and negotiate partnerships modalities with selected TSPs
- assign and build the capacity of an in-house RE champion
- build the capacity of staff to promote RETs and offer RE financial products.

More specifically, RE companies engaging in PAYG could benefit from guidance and support to:

- develop adapted financial products through PAYG
- integrate client protection principles in their practices
- manage credit risk
- monitor their portfolio
- educate clients on PAYG and digital payment solutions.

In contexts where the rural finance and RE sectors are still at an early development stage, capacity-building for FSPs and TSPs on core skills may be critical as well, such as proper accounting and administrative structure, financial management, marketing, human resources management, distribution channels, product design and fundraising, among others.

Support service providers that accompany stakeholders and act as facilitators

When the approach chosen is that of building local partnerships between FSPs and TSPs (the two-hand model), experience shows that having a facilitator is significant in helping to avoid misunderstandings and build trust among partners. FSPs and RE TSPs come from two sectors that have their own visions, procedures, priorities, constraints and technical language, and that are not used to working together.

Many attempts to set up such partnerships have failed in the past. Building strong partnerships remains a learning process that requires strong motivation, commitment, patience and perseverance from all partners. A specialized service provider (e.g. a non-governmental organization or company) playing the role of facilitator can help FSPs and TSPs overcome possible misunderstanding and tensions; improve their understanding of each other; facilitate negotiations to achieve balanced, win-win agreements; and keep motivation levels up. This can be done by facilitating workshops, organizing exchange visits, advising on legal agreements, and providing ad hoc technical support during the first years of collaboration.

Encourage below-the-line marketing strategies

Some of the most successful RE finance initiatives have shown that a personal connection is needed to build trust among rural populations with little or no experience of RE solutions, overcome their risk aversion in front of innovative technologies, and encourage them to invest. Word of mouth is usually the strongest vector of sales of RE solutions in rural areas. To foster uptake, “below-the-line” marketing strategies can be encouraged as well. Such strategies could consist in displaying RE solutions in demonstration sites (e.g. FSP branches), organizing demonstration sessions during group meetings or market days, or setting up sponsorship programmes. People need to see, touch and test a new technology, as well as hear from previous clients’ experience, before deciding to buy it – and even more so when the purchase is to be done through a loan. IFAD could finance some below-the-line activities that reach out to people in remote rural areas.

Support the development of last-mile agent networks in rural areas

No RE finance project can succeed without paying careful attention to the last-mile distribution network. Today, the limited capacity of the RE supply chain to reach remote rural areas remains the most critical challenge facing RE finance projects. There is a clear need to support the development of decentralized networks of sales agents and technicians for greater outreach and quality, and efficient and sustainable customer services in rural areas (e.g. for installation, customer education, after-sales services). Such networks can be developed as proprietary networks of TSPs, or as stand-alone networks, through the set-up of a social business specialized in the last-mile distribution of RE solutions, for instance.

Training programmes for last-mile agents are a key component, but do not translate into actual changes without proper follow-up mechanisms. Indeed, one-off training events for last-mile agents are clearly not sufficient to ensure the development and sustainability of customer services in rural areas. Most important is to set in place mechanisms for regular technical support and monitoring of these agents, with regular refresher trainings (e.g. monthly meetings), coaching services, technical referral persons to provide them technical support when needed, the definition of targets and monitoring of performance, performance-based incentives, and opportunities for regular peer-to-peer learning between last-mile agents, among others. It is essential to develop a full business model that will ensure the efficiency and sustainability of the last-mile agent network. IFAD can play a key role in supporting projects aiming to strengthen last-mile distribution channels.

Facilitate access to capital for FSPs and TSPs

FSPs operating in rural areas often have limited financial resources and may lack the capital to develop a RE portfolio, in particular for larger productive RE solutions. Likewise, TSPs face financial constraints to developing their local presence in rural areas and/or to expanding an offer of PAYG service. IFAD could play a role in facilitating access to capital for both FSPs and TSPs. Various types of financial mechanism can be envisioned, such as matching grants, equity, credit lines and guarantee facilities.

Scaling up

Scaling up at the micro level

- **Encourage innovation in productive RE solutions.** Most RE providers have focused on developing energy solutions for households' basic needs (cooking, lighting, mobile phone charging). There is still a lack of adapted, efficient and affordable RE solutions to respond to the productive needs of smallholder farmers and rural businesses (e.g. water pumping, processing, post-harvest activities). Having a broader variety of RE solutions to fit the productive needs of rural populations 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 to both FSPs and TSPs). When support is provided only to one part of the chain while the other remains weak, upscaling is strongly compromised. IFAD should support projects with a vision to build complete, efficient ecosystems for access to RE solutions in rural areas.
- **Digitalize rural FSPs.** Making use of digital channels could enhance the outreach and uptake of loans for RE solutions, for example by integrating some features of the PAYG model into the current microfinance model. PAYG models have mostly been tested so far by RE solution providers alone, without taking advantage of the clear synergies that could be found with rural finance institutions. Exploring these opportunities and innovative models can be a promising strategy to upscale access to RE solutions in rural areas.

Scaling up at the meso level

- **Encourage experience-sharing and develop business cases.** Even though experiences in RE finance have multiplied in recent years, the lessons learned and best practices have been little disseminated. National networks of FSPs, as well as national networks of 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.

Scaling up at the macro level

- **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; and (2) defining net-metering policies, which ensure that excess energy can be sold back into the grid, allowing grid-connected rural communities to generate a profit from investing in RETs.
- **Support the development and adoption of quality standards for RE solutions.** In the context of proliferation of counterfeit and cheap RE solutions, standards are critical to help FSPs and rural clients differentiate between low-quality technologies and high-quality ones. Such standards do exist for pico solar solutions thanks to the Lighting Global international initiative. However, they remain little known to FSPs and rural customers, or even to national authorities. Furthermore, such international standards have not yet been developed for larger RE solutions. Helping governments to develop their certification capacities for various types of RE solutions would help to avoid the proliferation of low-quality technologies, as well as encouraging local production and/or assembly of high-quality solutions. In addition, for certification to play an effective role, there is a need to raise awareness among the various stakeholders (e.g. TSPs, FSPs, end-users) on the existence and meaning of these standards and certification schemes.

- **Appeal for the endorsement of client protection principles by PAYG providers.** TSPs that provide 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 (in terms of pricing, as well as portfolio quality) and, in some cases, rather aggressive commercial strategies that leave end-users without protection. Mainstreaming client protection principles into PAYG providers' practices would help to avoid a crisis similar to those that have afflicted the microfinance sector.
- **Promote end-of-life management for RE products.** So far, there has been a lot of enthusiasm for the "friendliness" of RE solutions to the environment. However, little attention has been paid to the negative impacts that will be generated by RE solutions when they reach the end of their working life and become waste. Most stakeholders have been postponing such reflection for the future, as they prioritize reaching greater scales. However, if RE solutions do increase in scale, all stakeholders will soon be confronted with a clear waste management issue. It is essential to start engaging in more active reflection, among all stakeholders, on possible strategies for RE waste collection, disposal and recycling.

Tools

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