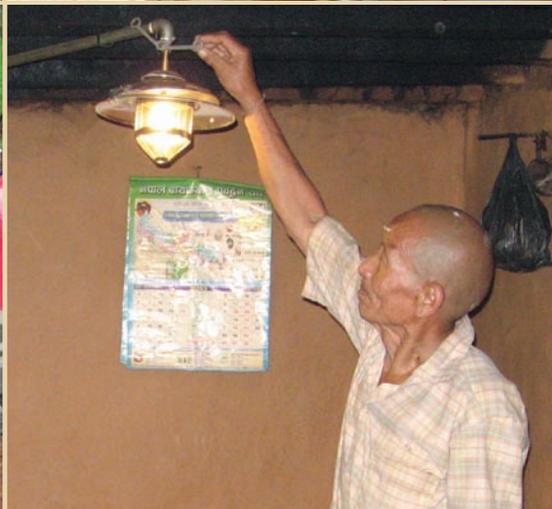


Bringing Small-Scale Finance to the Poor for Modern Energy Services: What is the role of government?

EXPERIENCES FROM BURKINA FASO, KENYA, NEPAL AND TANZANIA



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**Federal Ministry
for Economic Cooperation
and Development**

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□ Foreword

We are at a crossroads with energy and development. Our current path leads us to a situation where modern energy will continue to be out of reach for the poor and we will see an acceleration of climate change, which impacts the poorest people the most. If we continue on the current path, it is possible that we will stay at the same place we are right now—with 1.6 billion people without electricity and 2.4 billion people still cooking on traditional fuels. Instead, the path we propose to follow leads to a wider availability of modern energy options that are affordable for the poor.

It is necessary to tap into the momentum generated over the last 30 years by the microfinance movement to make the link with modern energy. Currently, the link between energy and small-scale finance, including microfinance, is weak and our experience is limited. For example, there are energy enterprises unwilling to serve the rural poor without a guarantee that their customers have access to financing options. Conversely, most microfinance institutions are unwilling to issue loans for energy products without being assured that they have an energy enterprise that can provide high-quality products that their clients want to buy.

The current gap that exists between access to modern energy and small-scale finance is the premise for this paper. Specifically, we look at the role of government in bridging the gap, because the public sector has an important role to play in creating the necessary policies, incentives, and funding to bring financial institutions together with energy enterprises to serve the poor. The private sector cannot take on this task in isolation. Governments must facilitate and encourage the various private-sector actors to initiate and expand small-scale finance to catalyze increased access to affordable, modern energy services in a way that can have fundamental impacts on the health, well-being, and economic productivity of the poor.

This paper was prepared by a group of leading experts who bring together their collective experiences to present the different dimensions of the role of government in small-scale finance in Burkina Faso, Kenya, Nepal, and Tanzania. The paper highlights the variety of approaches in the four countries to draw out general policy recommendations for the wider community. I hope the report will offer valuable lessons for practitioners, policy makers and decision makers from governments, donor organizations, financial institutions, and energy enterprises.



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This paper was commissioned by the United Nations Development Programme (UNDP) to gain a better understanding of how small-scale finance can help the poor gain access to modern energy services and what government can do to help in this effort. The publication represents many years of ‘learning by doing’ highlighted in case studies from Burkina Faso, Kenya, Nepal, and Tanzania. It benefited from valuable contributions and collaborative efforts of many people, including the lead authors, case study contributors, and staff working in the Sustainable Energy Programme within the Environment and Energy Group (EEG), Bureau for Development Policy, as well as invaluable peer-reviewers both internal and external to UNDP.

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□ Acronyms

ADBL	Agricultural Development Bank (Nepal)
AEPC	Alternative Energy Promotion Centre (Nepal)
Ah	Amp-hour
BSP	Biogas Support Programme (Nepal)
CBO	Community-Based Organization
CFL	Compact Fluorescent Light
CGAP	Consultative Group to Assist the Poor
Ksh	Kenyan Shilling
KUSCCO	Kenya Union of Savings and Credit Cooperatives
kW	Kilowatt
kWh	Kilowatt-hour
LPG	Liquefied Petroleum Gas
MFDB	Microfinance Development Bank
MFI	Microfinance Institution
MFP	Multi-functional Platform
NGO	Non-governmental Organization
NRB	Nepal Rastra Bank
PRET	Promotion of Renewable Energy in Tanzania
PRSP	Poverty Reduction Strategy Paper
PV	Photovoltaic
RCPB	<i>Réseau des Caisses Populaires du Burkina</i>
REA	Renewable Energy Agency
RESP	Rural Energy Service Provider (Tanzania)
RET	Renewable Energy Technology
RFSP	Rural Financial Service Provider (Tanzania)
ROSCA	Rotating Savings and Credit Associations
SACCO	Savings and Credit Cooperatives
SESP	Solar Energy Support Programme (Nepal)
SHS	Solar Home System
UNDP	United Nations Development Programme
VICOBA	Village Cooperative Bank
XOF	<i>Communauté Financière Africaine Franc</i>
W	Watt



Executive Summary

Access to small-scale finance—that is, small loans, credit, and other financial products tailored to low-income individuals, households, and businesses—is extremely important for expanding access to modern energy services. However, the reality is that the poor typically have limited options for financing the purchase of modern energy services (lighting, refrigeration, mechanical power for grinding and milling, heat, cooking fuels, etc.). This is despite the fact that unlocking access to credit for modern energy has the potential to unleash economic productivity for small enterprises, to create improved health and educational prospects, and to help build assets and incomes of the poor.

This paper aims to look into one of the key levers for unlocking access to small-scale finance for modern energy—government at the local and national level. The premise is that access to modern energy services can be increased if small-scale finance options are available, and that the government can play a catalytic role in putting the pieces into place. Governments in some of the poorest developing countries are providing support and incentives for small-scale finance for energy. However, it is not always clear how effective the various measures and initiatives taken in different countries have been in enabling the poor access to small-scale finance for energy services.

Overview of Case Studies

Drawing on evidence from four countries—Burkina Faso, Kenya, Nepal, and Tanzania— this paper documents and examines seven cases which offer lessons on the role of governments in removing barriers and bridging the knowledge and resource gaps that constrain the poor from accessing small-scale finance essential for purchasing modern energy. These particular cases were selected based on their ability to show clear programme impact as well as to illuminate policy-relevant lessons.

Of particular interest is the extent to which existing government policies provide an enabling framework for small-scale finance for energy and favourable market conditions for meeting the energy needs of the poor.

■ BURKINA FASO

Government Co-financing for Community-Based Energy Systems. This case highlights the multi-functional platform (MFP), a simple, stand-alone community energy system that is well suited to rural areas without access to electricity. MFPs provide mechanical power for household food processing, freeing up women's labour to spend more time on education, health, and child care. However, the newest generation of MFPs also has the potential to provide additional energy services, such as electrification, water pumping, and battery charging. Burkina Faso's experiences with this programme point to a strong demand for small-scale finance to support income-generating activities enabled by the MFPs. This case also demonstrates the potential for creating public-private partnerships to provide the capital investment needed to expand energy services for the poor.

■ **KENYA:**

Policies for Private Distribution of Electricity and Financing for Communities. This case addresses the removal of barriers, including policies and lack of access to financing, that constrain small-scale electricity generation and distribution in rural communities. It demonstrates how, in a favourable policy environment with access to small-scale finance, community-based schemes can deepen access to electricity for low-income rural households.

■ **KENYA:**

Combining Small-scale Finance with a Policy Push for Modern Cooking Fuels. This case demonstrates how access to credit through microfinance institutions contributed to the rapid uptake of modern cooking fuels—specifically, liquefied petroleum gas (LPG)—by households. In particular, it highlights the role of savings and credit cooperatives in enabling relatively poor households to acquire LPG burners and cylinders. Major policy steps taken by the government, including the removal of Value Added Tax (VAT) and import duties on LPG, also played a key role in expanding the market and putting this fuel within the reach of poorer households.

■ **NEPAL:**

Dedicated Government Agency Linking Microfinance Institutions with Solar Enterprises. This case documents Nepal's Solar Energy Support Programme (SESP), which has installed more than 100,000 solar home systems (SHSs). An important lesson here has been the strong correlation between loan recovery rates and the performance of the SHSs. Nepal's experience demonstrates the need for effective collaboration among government, microfinance institutions, and solar enterprises to ensure quality installation and maintenance.

■ **NEPAL:**

Reducing Technical Risks and Transaction Costs for Biogas. This case illustrates the government's efforts to promote wide use of biogas by providing a targeted subsidy amounting to some 25 to 45 percent of the total biogas plant cost. The experience in Nepal shows

that linking the subsidy to quality equipment and reliable suppliers ensures that consumers benefit and that funds are used efficiently.

■ **TANZANIA:**

Government Linking Small-scale Finance, Energy Enterprises, and Reliable Service.

This case examines the PRET (Promotion of Renewable Energy in Tanzania) programme, which aimed to facilitate and support private-sector-led growth of the rural energy market by linking financing, solar energy enterprises, and service for consumers. Tanzania's experience indicates that partnering with the government also increased PRET's potential for programme sustainability and scale-up.

■ **TANZANIA:**

Commercially Driven Solar Financing Model.

This case concerns a project by a microfinance institution to provide loans for solar home systems (SHSs). Experience with this project indicates several weaknesses inherent in its design and delivery. The case highlights the importance of establishing realistic project timeframes, creating effective economic incentives for quality installation of SHSs, and seeking active engagement and partnership with relevant government departments.

Recommendations for Government Action

The experiences from the cases clearly point out that governments have a critical role to play in removing policy, regulatory and technical barriers that prevent small-scale finance from happening. Access to modern energy services will grow at a higher rate in countries where governments take strong leadership in setting pro-active policies and regulations and simultaneously facilitate the innovative models for small-scale finance directed at energy.

A set of four concrete recommendations for policy-makers emerged from the case studies in Burkina Faso, Kenya, Nepal and Tanzania to support the expansion of small loans for modern energy.

■ **Analyze the current situation on small-scale finance for modern energy services**

Objective baseline information about the priority regions in the country needs to be available in order to help the local energy enterprises and financial institutions initiate or expand lending for energy. With resource constraints and the perceived risks that financial institutions see in expanding into energy lending, it is necessary for the government to take a leadership role in assessing the gaps and identifying opportunities in the priority regions for improving energy access. This means that the government must first send a strong signal to clearly identify priority regions and concrete goals for the region. Second, the government needs to support an assessment of the region including an overview of which modern energy systems, services, and enterprises are currently available and at what cost, the productive capacity of the target market, and the strength of institutions providing small-scale finance to the poor and where they are operating.

■ **Create enabling conditions for linking small-scale finance options with national rural energy programmes and policies**

Governments can foster synergy and coordination of rural energy programmes and small-scale finance programs and institutions at the local, national, and regional level. By leveraging budgets and institutional capacity across sectors, it will be possible to share lessons and experiences, reinforce and mutually support the energy and finance initiatives, and meet the respective targets more efficiently. Moreover, public policies and investments for rural energy should include a component to support the expansion of small-scale finance. Allocation of a portion of the national budget for energy linked to small-scale finance sends a strong signal to the private sector—on both the energy and finance sides—that the government is taking this seriously. For example, public funds could be used for loan

guarantees for the financial institutions, expanded access to working capital for energy entrepreneurs and financial institutions serving the poor (e.g., microfinance institutions and savings and credit cooperatives), special funds for specific purposes (e.g., loan funds for women and loan funds for renewable energy enterprises), and programmes to build the capacity of the financial institutions and/or energy entrepreneurs serving the poor.

■ **Facilitate partnerships to strengthen financial institutions and energy enterprises serving the poor**

The lack of strong linkages between financial institutions and energy enterprises is severely limiting the potential market for affordable modern energy. With the energy-finance gap filled, the potential to transform the market is immense, and the government can play a key role in jump-starting this. Most important, the government can facilitate local business development by providing a platform for information sharing, dialogue and collaboration between the sectors—bringing to light the business opportunities that exist in this space and ultimately fostering the creation of business relationships. In addition, technical assistance and business development support is needed on the specific market, policy, enterprise, and customer issues to help bridge the knowledge and resource gap that is hindering the expansion of small-scale finance for modern energy. Specific things that government can undertake include: (i) adopting standards for good business practices and services for providing small-scale finance for energy; (ii) allocating funds for research and development to develop products tailored to meet the needs of the poor at reduced costs; (iii) participating in regional microfinance-energy practitioner networks; and (iv) supporting learning exchanges with other financial institutions active in small-scale finance for modern energy.

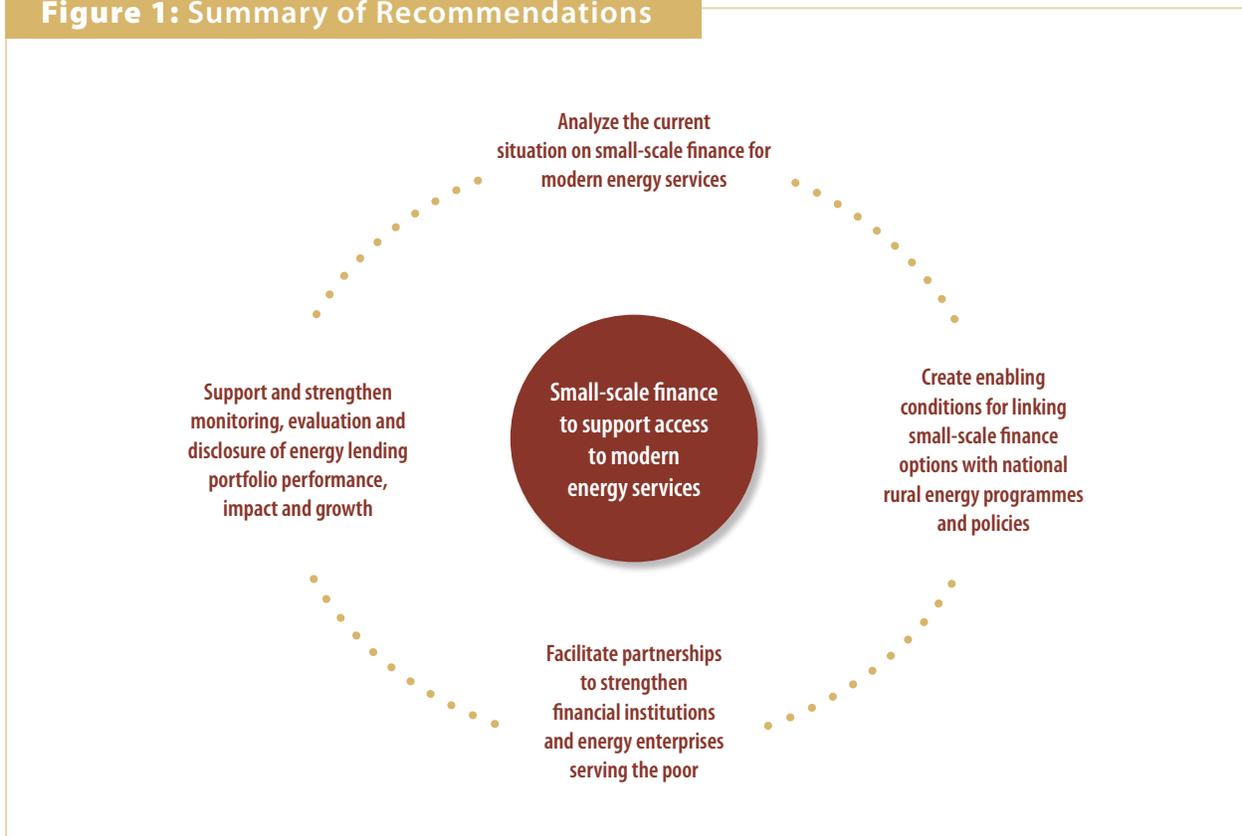
■ **Support and strengthen monitoring, evaluation, and disclosure of energy lending portfolio performance, impact, and growth**

The risks and rewards for small-scale finance for modern energy are not well understood. The current situation is one of limited information about energy loan performance and different loan methodologies, as well as the different energy products' market availability, reliability, maintenance needs, income generation impact, and environmental benefits. The knowledge gap is severely constraining the entry of financial institutions and energy enterprises into small-scale loans for modern energy. Government can play two roles. One is to support awareness raising and advocacy on how small-scale finance can make a difference. Second, and most important, there is a need to provide credible and consistent information on energy lending.

For example, microfinance institutions over the years have created a very efficient way to track the various loans that are being made, the quality

of the portfolio, the number of clients, and the overall impact they are having with economic and social development. These kinds of standards and disclosure requirements are now absent for most energy loans. As important, though inconsistently documented, are the considerable expenditures on energy by the poor and, more important, how access to financial services can transform rural and urban populations into vibrant and profitable energy markets for the financial service providers. Given that the experience with small loans for energy is still limited and the number of loans issued quite small, there is an excellent opportunity to start building monitoring and disclosure standards that are modelled after the microfinance sector. The government can play a key role in supporting standards for independent reviews and disclosures (according to accepted standards) of existing small-scale finance programmes and the development of rigorous systems for regularly monitoring and tracking loans for modern energy.

Figure 1: Summary of Recommendations





Linking Modern Energy and Small-scale Finance

Access to modern energy services can be greatly enhanced if poor men and women are also provided with access to financing and credit to pay for the energy products providing these services.

Typically the price of modern energy systems is between USD 20 and USD 300 for systems such as biogas, micro-hydropower, solar, and fuels such as liquefied petroleum gas (LPG). This price tends to be higher than the amount most poor women and men can afford on a cash basis—if cash is even available. At the same time, the level of required financing often falls beneath the threshold of what commercial banks are willing to finance, or they are unable to provide finance without collateral. The reality is that the poor are caught in the middle, with no access to modern energy services and limited options for financing to purchase such services. The premise of this paper is that access to modern energy services can be increased if small-scale finance options are available, and that the government can play a catalytic role in putting the pieces into place. Small-scale finance in the context of this paper refers to small loans, credit, and other financial products provided to individuals, households, and businesses that are tailored to low-income people.

Governments in some of the poorest developing countries in the world are providing support and incentives for small-scale finance for energy. However, it is not always clear how effective the various measures have been. This paper seeks to better understand the role of government by examining experiences in four countries and answering the following questions:

1. What role can access to finance play in expanding access to modern energy services for the poor?
2. What is the appropriate role for government in expanding access to small-scale finance for energy services so that it reaches the poor?

The paper documents and examines experiences in Burkina Faso, Kenya, Nepal, and Tanzania, where government programmes and policies are targeted towards improving the availability of small-scale finance to provide access to modern energy services. Of particular interest is the extent to which existing government policies provide an enabling framework for small-scale finance for energy and favourable market conditions for meeting the energy needs of the poor.



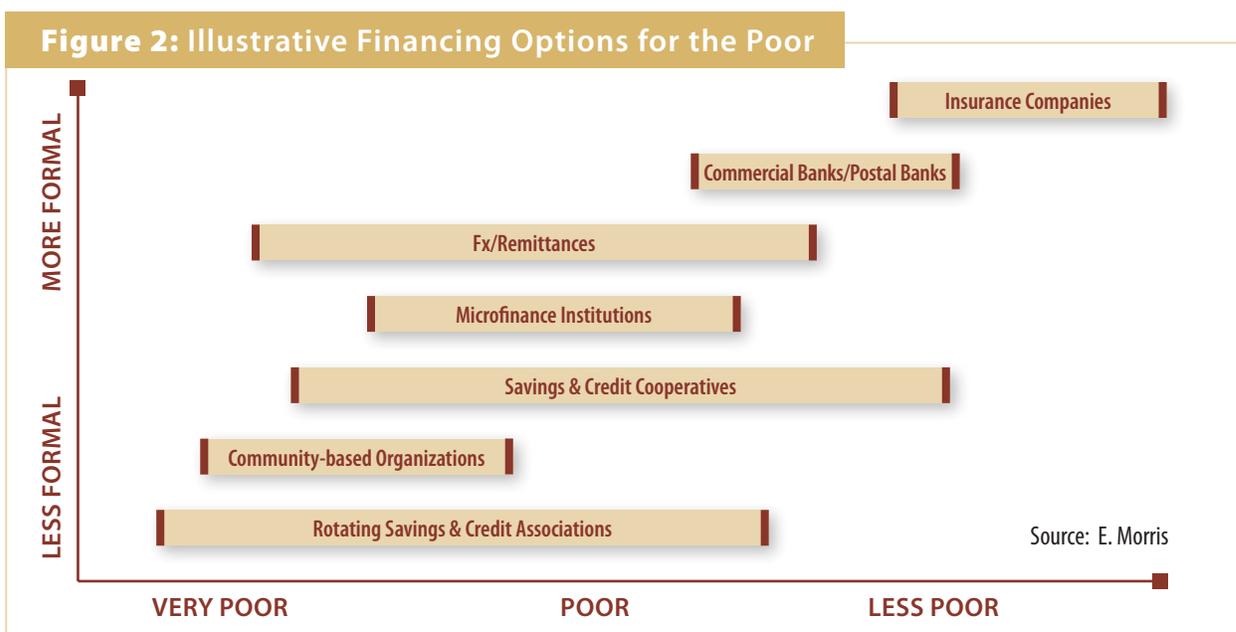
Overview of Small-scale Finance

A range of financial institutions and financing arrangements aims to serve the poor in developing countries, with varying degrees of success.

Commercial banks dominate among the more formal institutions, while microfinance institutions, savings and credit cooperatives (SACCOs), rotating savings and credit associations (ROSCAs), and community-based organizations (CBOs) are the main informal institutions. Over the last decade, the boundary between the types of financial institutions serving the poor has begun to blur as the more formal financial institutions are expanding their service offerings to include small-scale financial products (Figure 2). As more traditional financial players recognize that serving the poor and low-income customers can be a viable business proposition, there are considerable challenges to be overcome as the sector scrambles to scale up existing services to a larger number of people in increasingly remote areas, and seeks to find ways to lower costs faced by both the microfinance institutions and customers. Partnering with the energy sector can open new financial and

energy markets, can attract new customers for financial services and existing customers to energy services, and can help alleviate or ameliorate poverty for millions of poor people worldwide.

Burkina Faso, Kenya, Nepal, and Tanzania are developing countries with under-developed physical, financial and energy infrastructure. (Box 1 on p.15, gives a brief description of each country.) These countries have large percentages of people living in rural areas that are un-served or under-served by financial services and lack access to energy services. However, each of the four countries is moving toward more robust and open financial systems and recognizing that energy access can be a means for poverty reduction and for meeting a range of other development objectives. There is also a more diversified set of financial institutions operating in these countries, including those that serve the poor like microfinance institutions and savings and credit cooperatives.



■ Box 1: Snapshot of the Countries Studied

Burkina Faso

Burkina Faso has a population of 15.3 million. It is a country challenged by difficult economic conditions, made worse by severe intermittent droughts. About 90 percent of the population is engaged in subsistence agriculture. Only about 18 percent of the total population has access to electricity (40 percent in urban and 3 percent in rural areas).

Kenya

The population of Kenya is 38 million. About 58 percent of the population lives on less than \$2 per day with about three-quarters of those living in rural areas. The number of urban poor is also on the rise. Twenty-two percent of the population has access to grid electricity.

Nepal

Nepal has a population of about 28 million and is one of the least developed countries in the world. About 90 percent of the population lives on less than \$2 per day. Agriculture is the mainstay of the economy, providing a livelihood for three-fourths of the population and accounting for 38 percent of GDP. A third of the population has access to electricity.

Tanzania

Of Tanzania's 34 million inhabitants, fewer than 10 percent have access to grid-based electricity and other forms of modern commercial energy. Access to modern sources of energy is particularly low among the rural population; as over 98 percent of rural people remain unconnected to the grid, relying on biomass sources, kerosene, and dry cell batteries.

Source: CIA 2008.

Table 1: Summary of Key Financial Data

	Access to Formal Financial Services (%)	GDP per Capita	Number of Banks	Number of Microfinance Insitutions and Borrowers	Savings and Credit Cooperatives (Number of Members)	Total Population (1,000)	% Pop. Living on <\$1/Day / <2\$/Day
Burkina Faso	26	\$1,084	10	15 with 336,000 borrowers	1,140,000	15,757	27% / 72%
Kenya	10	\$1,436	84	29 with 692,000 borrowers	3,265,545	39,802	23% / 58%
Nepal	20	\$999	18	47 with 707,000 borrowers	172,830	29,331	58% / 90%
Tanzania	5	\$1,126	53	13 with 197,000 borrowers	500,000	43,739	24% / 69%

Source: CGAP 2009 and UNDP 2006.

In the policies governing the financial sector in the four countries, integrating small-scale finance within the broader national macroeconomic policies is a critical first step towards raising the visibility and recognition of small-scale finance and energy as an important tool for poverty reduction and socioeconomic development. To this end, the policies coming out of key planning and resource-allocating ministries and agencies (for instance, the Ministries of Finance, Planning,

Energy, and Rural Development and the Central Bank) need to happen in tandem with strengthening the framework for energy access, which is typically under the direction of the Ministry of Energy or the Rural Electrification agency. Finally, it is necessary to have a regulatory framework that enables financial institutions to raise capital and boost lending capacity for energy through mechanisms such as direct deposits, bond issuances, wholesale credit funds, and specialized funds.

Burkina Faso

What distinguishes Burkina Faso from the other three countries is that the financial sector is strongly integrated within a regional framework, namely the West African Economic and Monetary Union (WAEMU). Established in January 1994, WAEMU is made up of eight West African countries (Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal, Togo, and Guinea Bissau) which are, in turn, members of the Franc Zone and use the CFA Franc (XOF) currency. Branches and subsidiaries of foreign or regional banks play a relatively important role in financial intermediation in WAEMU, including Burkina Faso. The main institutions that are members of the WAEMU banking system are Bank of Africa, BNP Paribas, Credit Lyonnais, Citibank, Ecobank, Financial B.C., and Société Générale, and they all have relatively wide national networks.

A range of microfinance institutions playing an important role in the economy dominates the informal financial institutions in Burkina Faso. As of December 2006, more than 600,000 people benefited from the services provided by eight main microfinance networks. According to the African Development Bank (AfDB 2009), microfinance networks in Burkina Faso contributed approximately USD 70 million (or 1 percent of GDP) to the national economy in 2006. Microfinance institutions are governed by a separate law, the PARMEC (*Projet d'Appui à la Réglementation des Mutuelles d'Épargne et de Crédit*) Law, which regulates microfinance activities in all WAEMU countries. Burkina Faso is also a signatory to the Organisation for the Harmonisation of Business Law in Africa (OHADA) Treaty, which harmonizes business law in 16 sub-Saharan African countries, including all the WAEMU countries.

Kenya

Kenya's financial sector remains one of the most vibrant in sub-Saharan Africa with a range of financial institutions operating in the country, including commercial banks, post office banks, mortgage institutions, capital markets, foreign exchange bureaus, savings and credit cooperatives (SACCOs), microfinance institutions, hire-purchase enterprises, and non-governmental organizations (NGOs), offering a wide range of financial services. The more informal institutions, operating at the local level, include moneylenders and rotating savings and credit associations (ROSCAs)¹. SACCOs are a vital source of financial services in Kenya, and by one estimate, the Kenyan SACCO subsector is the largest in Africa (Bokea 2007). As a source of financing, SACCOs are crucial to Kenya because they draw membership from diverse economic subsectors such as formal and informal employees, and traders involved in a wide range of microenterprises.

Relative to other countries in sub-Saharan Africa, Kenya's portfolio of financial institutions is large, reflecting the country's high degree of financial liberalization and economic stability (Table 2). However, despite the economic stability and a sizeable number of financial institutions, access to formal financial services is still quite limited. Only about 10 percent of Kenyans have access to formal financial services, while some 35 percent rely on informal institutions. An estimated 38 percent of the population is 'financially excluded', because they do not use either formal or informal financial services.

¹ ROSCAs, also known as 'merry-go-rounds', are a form of village-level self-help initiative where members pool savings, which are then loaned to individual members in turns. Typically, once every member in the group has had an opportunity to access his or her rightful share of the collective savings, members start another cycle of 'saving and lending' amongst themselves.

Table 2: Kenya: Funding from Formal and Informal Financial Institutions

	Membership Base	Funding Methodology	Regulation
Formal Institutions			
Savings and credit cooperatives (SACCOs)	Mutual membership organizations, such as SACCOs and ROSCOs. In 2005, there were 3,000 SACCOs with over 3 million members.	Pool voluntary savings from members in form of shares. Shares form basis for extending credit to members.	Regulated by the Co-Operative Societies Act (2007).
Kenya Post Office Savings Bank Ltd.	Individuals with small savings	Provides deposit services	Supervised and regulated by the Ministry of Finance
Non-governmental organizations (NGOs)	Microfinance NGOs and community-based organizations. Over 50 NGOs in Kenya offer microfinance.	Provide microfinance along with social welfare services. Use informal community-based systems to deliver credit and savings services.	Varies; some operate as limited companies or building societies. Regulated by Micro Finance Act (2007).
Informal Institutions			
Rotating savings and credit associations (ROSCAs) and self-help groups (SHGs)	Mutual membership clubs registered as social welfare groups	Members pool resources, which are lent to individual members in turns.	Many smaller ROSCAs are not formally registered. SHGs are registered under the Department of Culture and Social Services.

Source: Kabutha et al. 2007.

Nepal

The financial sector in Nepal is quite diversified, with a large number of institutions offering a relatively wide array of financial services. However, outreach by the financial service providers to the low-income population remains limited. The formal financial sector in Nepal consists of commercial banks, development banks, finance companies, and microfinance institutions. Development banks, created by the 1996 Development Bank Act, include both the regional rural development banks in the government sector and microfinance development banks (MFDBs) established by the private sector.

Informal financial institutions include savings societies, MFDBs, and financial intermediary NGOs. The informal institutions serve roughly 660,000 households, or about 13 percent of households in the country (AEPC/ESAP 2006). Over 3,500 SACCOs are registered with the Cooperative Department; they serve about 10 percent of total households (AEPC/ESAP 2006). Despite the seemingly large number of institutions providing financing (Table 3), insufficient attention has been paid to the quality of the financial services provided, the sustainability of the institutions providing the service, and—in particular for the very poor in remote areas—the ability of borrowers to utilize credit for gainful enterprise to earn a profit and repay loans rather than increasing their debt.

Table 3: Financial Institutions Operating in Nepal

	Commercial Banks	Development Banks	Financing Companies	Fingos	Licensed Cooperatives	Unlicensed MFIS
Participation in financial market	Commercial lending, lending to microfinance institutions (to satisfy the 3 percent lending to the un-served sector and priority sector lending requirement)	- Agricultural sector; - National priority industries - Poorer households (mainly women)	- Individual consumers - Small businesses	Poor members of society who lack access to credit services	Low-income individuals (can provide financial services to both members and non-members)	- SACCOs: Low-income individuals - NGOs: Poor members of society
Legal basis for regulation	Nepal Rastra Bank Act (2002), Sec 79	Nepal Rastra Bank Act (2002), Sec 79	Nepal Rastra Bank Act (2002), Sec 79; Finance Company Act	Nepal Rastra Bank Act (2002), Sec 79; Financial Intermediaries Societies Act (1998)	Nepal Rastra Bank Act (2002), Sec 79; Cooperatives Act (1992); Financial Intermediary Societies Act (1998)	- SACCOs: Societies Registration Act; Cooperatives Act (1992) - NGOs: Societies Registration Act; Social Welfare Act (1991)
Regulator	Nepal Rastra Bank (NRB)	NRB	NRB	NRB	Ministry of Agriculture, Department of Cooperatives, and NRB	Ministry of Agriculture, Department of Cooperatives

Source: Hilman et al. 2007.

Over the last few years, the government of Nepal, through the Central Bank, has moved to consolidate and enhance stability in the financial sector. To this end, the government has undertaken a number of reforms, including enhancing the inspection and supervisory capacity of the Central Bank, establishing a Debt Recovery Tribunal, and strengthening the Credit Information Centre to improve transparency.

Tanzania

Tanzania has both formal and informal financial institutions. Included in the formal category are commercial banks while the informal category comprises about 1,600 SACCOs, 50 savings and credit associations (SACAs), and a host of CBOs, NGOs, and village cooperative banks (VICOBA). VICOBA are even smaller than SACCOs, but their service outreach is further than the SACCOs. Since members pool savings and lend them to one another, VICOBA are considered a type of rotating savings and credit association (Bank of Tanzania 2005).

Since 2005, the Tanzanian economy has been growing at an average of 5 to 6 percent per year and was projected to grow at 6.5 percent in 2008. Through a wide range of policy reforms, including liberalization of the local economy, the government is encouraging private investment in the financial sector to sustain and boost the current economic growth. The entry of two major international microfinance institutions, BRAC Tanzania and ACCESS Bank, in 2006 reflects positively on the improved investment climate in the microfinance sector as well as general economic stability in the country.



The Role of Government in Providing Small-scale Finance for Modern Energy Services: Selected Case Studies

Burkina Faso, Kenya, Nepal, and Tanzania have achieved impressive results with respect to increasing access to modern energy services through the provision of small-scale finance.

These countries also illustrate a diverse range of approaches and institutional modalities. The role of government is contextualized by examining seven case studies relating to the promotion of various kinds of energy sources: the multi-functional platform for rural energy (Burkina Faso), micro-hydropower (Kenya), liquefied petroleum gas for domestic use (Kenya), solar energy (Nepal and Tanzania), biogas energy (Nepal), and multiple sources of rural energy (Tanzania). The case studies were selected to demonstrate impact as well as to deliver policy-relevant lessons. Moreover, the examples explore how effective the governments were in expanding access to modern energy services for the poor through small-scale finance.

Burkina Faso: **Government Co-financing for** **Community-Based Energy Systems**

The multi-functional platform (MFP) has been successfully implemented in parts of West Africa, including Burkina Faso, to establish agro-processing enterprises in remote villages through the use of mechanical power. In Burkina Faso, the government, in conjunction with UNDP, took the initiative to promote the MFP as a means to improve access to modern energy services for the rural poor as set out in the Poverty Reduction

Strategy Paper (PRSP). The Burkina Faso MFP initiative is based on the experience of neighbouring Mali, where the MFP programme has been underway for over a decade (Brew-Hammond and Crole-Rees 2006)

The MFP is a diesel engine (typically 10 horsepower or 7.5 kW), mounted on a steel chassis that powers a variety of end-use equipment such as grinding mills, de-huskers, battery chargers, and water pumps. The engine can also generate electricity for lighting and refrigeration. Through the provision of these energy services, the MFP reduces time and labour required to complete daily tasks. As most rural villages in sub-Saharan Africa lack access to electrical and mechanical power, an MFP provides a simple, stand-alone energy system that can easily be transported and installed in rural areas where community members can be trained in its operation and maintenance. An important difference between the pilot phase and the current programme is that while first-generation MFPs focused exclusively on household food processing, second-generation MFPs are focusing more on productive uses, including the potential for additional social services, such as electrification, water pumping, and battery charging.

A core principle of the MFP enterprise is that it is established through a participatory business development process, with the capital investment co-financed by public and private sources. An MFP is provided to a village on the basis of a 3- to 6-month feasibility study, which considers several factors, including population, distance to grid, energy demands, and the willingness and capacity of the people to pay for their portion of the MFP. The total cost of the MFP equipment (including installation) is approximately USD 7,000. The UNDP Regional Programme currently works with women to assist them with literacy training and setting up a women's management committee to install and operate the platform. (An additional USD 5,000 in 'soft' costs for capacity development such as management, programme coordination, training, etc. is not included in the equipment cost above.)

The central role of the government in Burkina Faso is reflected in the co-financing arrangement for the MFP. Of a total budget of more than USD 10 million, 46 percent came from the government of Burkina Faso, 10 percent from UNDP, 9 percent from the beneficiaries, and the remaining 35 percent from other donors, including foundations and other bilateral donors (i.e., Bill and Melinda Gates Foundation, Shell Foundation, Lux development, and Aarhus Foundation). The government is also partnering with local NGOs working directly with the communities. Financing of the MFP project is facilitated through a tripartite arrangement between the NGOs implementing the projects, RCPB (*Réseau des Caisses Populaires du Burkina*, the network of local credit and savings cooperatives), and the Regional Solidarity Bank. Within this arrangement, the government and UNDP are responsible for developing the beneficiaries' capacity and monitoring and evaluating the MFP enterprises' performance. The Regional Solidarity Bank extends wholesale lending services to RCPB, which then provides small-scale finance to individuals to support small and medium enterprises involved, for example, in welding, pumping, battery charging, and grain milling, enabled by energy services provided by an MFP.

Evidence points to a high demand for small-scale finance to support income-generating activities enabled by the MFPs. Between 2004 and 2008, over 1,000 loans amounting to CFA 64 million francs (around USD 140,000) were advanced to nearly 60 associations in East Burkina Faso. On average, microfinance institutions charge a relatively low interest rate (10 percent), repayable within 9 to 12 months. MFPs are popular because their end-use equipment focuses on tools designed to reduce labour and drudgery, particularly for women. In Burkina Faso, the MFPs are credited with creating nearly 2,500 jobs in eight regions in addition to saving about 2 hours per day of women's labour. By reducing the time women spend on activities such as food preparation and processing, the MFPs have enabled women to spend more time on education, health, and child care. Women entrepreneurs who become MFP operators are able to generate income by providing grinding, milling, and husking services to community members for a fee. The fees collected pay the operating costs, including salaries, maintenance, and fuel.

Based on the experience gained so far, the government intends to progressively roll out the MFP programme to another 13 regions of the country, creating a total of 400 enterprises providing water and electricity services. The current plan is to maintain the same pricing and management structure as the programme expands. Once it is replicated and scaled up to other regions, the MFP programme is projected to create 4,000 new jobs and to impact the livelihoods of 500,000 people.

Main Lessons from the MFP Programme in Burkina Faso

Burkina Faso's experiences demonstrate that integrating access to modern energy within the broader poverty reduction framework, as represented for example by the Poverty Reduction Strategy Paper, provides an opportunity for creating public-private partnerships that are vital to delivering energy services to the poor. In this particular case, the PRSP was the policy lever through which the government provided co-financing for the MFPs while also leveraging extra resources from development partners such as

UNDP. Importantly, the MFP initiative was implemented through public-private partnerships involving the government, NGOs, a network of local credit and savings cooperatives, and the Regional Solidarity Bank.

With the services and products of the MFP, there was improved and diversified food production and improved access to loans, resulting in increased incomes for women. Although more than 1,800 jobs have been created and the results are encouraging, insufficient collaboration between actors in the field, executing NGOs, and project operators limited the impact of the MFP in Burkina Faso because people could not develop collateral businesses to expand their incomes. With the increased focus on electrification and water, it will be essential to focus on productive uses that can be supported, such as soap, shea butter, and processed grains. However, the linkages to NGOs that can create market channels for the communities and access to finance for the end users will be important in the sustainability and profitability of the MFP in Burkina Faso.

Kenya: Policies for Private Distribution of Electricity and Financing for Communities

An estimated 3 MW of hydropower potential in Kenya can be exploited through micro-hydropower schemes (about 5 kW each), supplying low-cost, if modest, electricity (roughly 20 W per household) for basic services, such as lighting and power for televisions and radios, to about 150,000 households. However, the promise of increasing access to rural electricity through micro-hydropower remains largely unfulfilled due to a number of barriers, notably a lack of access to financing and regulatory policies that have constrained small-scale electricity generation and distribution in rural communities. The Kathamba micro-hydropower scheme, a community-based ‘learning by doing’ initiative designed to inform energy policy and to demonstrate the benefits of leveraging community resources, both cash and in-kind, provides an important example of programmes aimed at increasing access to low-cost energy services for low-income communities in Africa.

Commissioned in 2002, the 1.1-kW pilot scheme is located in the Mt. Kenya region and is collectively owned and managed by a 60-member self-help group known as the Kathamba Electricity Users Association. The initiative is a partnership involving the European Commission, which provided donor funds; Practical Action, an NGO that provided technical support; and the Kenya Ministry of Energy, which provided policy guidance and support. Taking into account the limited system output (1.1 kW), and users’ willingness and ability to pay, the available power was divided into smaller 10 W ‘light packages’. One ‘light package’ is sufficient to power an 8 W compact fluorescent light (CFL) and a small radio. The members paid a connection fee depending on the number of packages each had subscribed to—about USD 60 for one package (10 W) and USD 80 for two packages (20 W). The total project cost was about USD 6,000 and community members raised about 30 percent of the project cost by providing labour and locally available building materials such as distribution poles. Currently, users pay a flat monthly tariff of USD 0.70 and USD 1.14 for one and two light packages, respectively. These funds are used to pay operation and maintenance costs.

While the bulk of project financing (70 percent) for the pilot project was provided externally, access to small-scale finance enabled the households to pay for the connection fee and purchase end-use devices. About one in every four connected households reported using credit from local ROSCAs and ‘tea SACCOs’ to pay for the required connection fee. (Tea SACCOs typically provide their members with loans pegged to an individual farmer’s rate of tea production and members are at liberty to invest the money as they wish as long as their rate of tea production is adequate to service the loan.) Moreover, loans from ROSCAs and farmers’ SACCOs were not limited to Kathamba—about 30 percent of households in Mutuma and Rutui, two other community micro-hydropower schemes in the Kirinyaga District, reported using small-scale finance from local ROSCAs and farmers’ SACCOs to finance the initial capital costs of the projects. This suggests that programmes are likely to be more effective if implemented in contexts where end

users also have access to small-scale finance that enables them to pay the high upfront costs associated with access to modern energy.

Main Lessons from the Kenya Micro-Hydropower Scheme

In many developing countries, energy policies that restrict generation and distribution of electricity by private companies and community cooperatives have been a major constraint to increasing access to modern energy in rural areas. As Barnes et al. (1997: 13) note, 'Off-grid power companies and cooperatives are often totally excluded by electricity regulations from serving people, and policies that artificially hold down prices sometimes provide little incentive for such local initiatives to get started.' Under the 1997 Electric Power Act, electricity distribution was restricted to the Kenya Power and Lighting Company, the national utility (Kenya 1997). The experience at Kathamba in 2001–03 was instrumental in the removal of this policy barrier. The community-based project demonstrated that local capacity for collective action, complemented by external technical assistance, can contribute to the policy goal of increasing access to rural electrification. Drawing from experience and lessons gained locally and elsewhere, Practical Action was able to successfully lobby the government to permit private distribution of electricity generated by cooperatives and other private investors in rural areas. In the revised 2006 Energy Act, not only is private generation and distribution of electricity permitted and encouraged, but equally important, private investors are allowed to charge tariffs that yield some return on investment (Kenya 2006).

When compared to other off-grid options commonly used in rural Kenya, such as solar home systems (SHSs) and automotive-type batteries, the Kathamba experience suggests that community-

based schemes hold promise for 'deepening' access to electricity for low-income rural households. The average life-cycle energy cost (USD 0.10/kWh) at Kathamba micro-hydropower is orders of magnitude cheaper than the energy from a typical (20 W crystalline) solar home system (USD 1.0/kWh) or auto-type (12V; 50Ah) batteries (USD 7.62/kWh)².

A promising, but yet to be tried arrangement is designing the micro-hydropower scheme to offer opportunities for income generation through centralized charging of batteries and other services. For example, standard automotive battery chargers can be located in the powerhouse and used to charge batteries during off-peak periods. The battery charging service is a low-cost method of extending the benefits of micro-grids to low-income households and to people not directly connected to electricity. Grain milling, metal welding, and hair and beauty salons are examples of additional income-generating activities that can be supported by micro-hydropower schemes with capacities of 2 to 10 kW. If done commercially, these productive uses can enhance the financial viability of the project while supporting socioeconomic livelihoods in rural areas. Also, with improvements in livelihoods, end users can build assets and more readily access additional financial products.

Kenya: Combining Small-scale Finance with a Policy Push for Modern Cooking Fuels

Accounting for over 80 percent of the cooking and heating energy needs in both rural and urban areas, traditional biomass-based fuels dominate Kenya's household energy mix. To reduce the high dependence on biomass fuels, the government has taken a number of policy measures to increase access to

² The order of magnitude estimates are based on the following assumptions. **Micro-hydro:** Power is available continuously (24 hrs/day) and operation and maintenance costs equal 5 percent of capital costs. **SHS:** Annual operation and maintenance costs are based on replacement of the battery every 2 years. For a more realistic estimate of power output (W) per panel, this value is based on measured watts rather than manufacturer's rated output (aSi 12Wp=10.6W measured; crystalline 20Wp = 17.2W measured (see Jacobson et al. 2000); effective direct sunlight = 7 hrs/day throughout the year. **Auto-battery only:** Costs \$70 and is re-charged weekly at USD 0.67 for 25Ah (50 percent depth of discharge). Battery voltage =12V and that its capacity remains constant, though in reality it diminishes over its lifetime. Transportation cost of batteries to charging stations is ignored, as it is common for households to use human transport. Opportunity cost of capital investment: Assume interest = 20%, repayable in 5 years for micro-hydro and SHSs and in 1 year for battery (see similar estimates in Maher et al. 2003, pp.1365–66).

and affordability of liquefied petroleum gas (LPG), a clean source of household energy. In 1994, the government liberalized the petroleum subsector, effectively making the private oil-marketing companies responsible for downstream supply, pricing, and marketing of petroleum products, including LPG. Partly due to liberalization, the number of household LPG cylinders grew significantly from 50,000 in 1995 to over 700,000 in 2002. Access to credit through microfinance institutions also contributed to the rapid uptake of LPG by households, including the Kenya Union of Savings and Credit Cooperatives (KUSCCO), an umbrella organization for nearly 4,900 SACCOs in Kenya (Kabutha et al. 2007). In this model, KUSCCO procures the LPG burners and cylinders (6 kg, 12 kg, and 35 kg) in bulk from Kenya Oil (Kobil), adds a 10–15 percent mark-up, and then distributes the products to the SACCOs. The SACCOs, in turn, provide their members an opportunity to acquire the cylinders on credit at an interest rate of 12–15 percent per annum, repayable in small instalments without collateral.

The end-user prices vary from USD 50 to USD 150 depending on the cylinder capacity. KUSCCO benefits from the trade margin because the LPG prices from the energy suppliers (Kobil) are lower due to bulk purchase. KUSCCO also makes some margin by extending wholesale credit for LPG to its member SACCOs. The SACCOs, in turn, earn interest on LPG loans while the customer receives modern energy services at competitive prices.

Main Lessons from LPG Financing in Kenya

The KUSCCO experience reinforces the finding that access to small-scale finance provides an opportunity for relatively poor households to purchase end-use devices for modern energy, such as LPG cylinders and burners. KUSCCO played a lead role in supporting wide-scale adoption and use of LPG by households in the country by working through their member SACCOs to provide a good product that meets the needs of the poor. At the same time, the government’s policy decisions to remove VAT and import duties on LPG, and to mandate the use of standard cylinders fitted with unified valves and regulators, helped expand the market reach of LPG to customers.

■ Box 2: ‘Policy Push’ for LPG in Kenya

In addition to access to small-scale finance for modern energy services, major policy steps taken by the government can further explain the rapid growth of LPG sales in the last 2 to 3 years.

- The government removed the value added tax (VAT) on LPG in June 2004 and then removed the import duty the following year, with the objective of expanding access to modern fuels for the poor.
- Lack of smaller, standardized LPG cylinders with interchangeable valves and regulators has been a significant impediment to the efficiency and competitiveness of LPG retail markets in Kenya and has limited the options available to customers. In an effort to remove this market

barrier and provide customers with smaller sizes that better suit their needs, the government passed the 2006 Energy Act prescribing that (i) the standard capacities for LPG cylinders in Kenya shall be 1 kg, 3 kg, 6 kg, and 12 kg; (ii) such cylinders shall be fitted with unified valves; (iii) every retail outlet selling LPG shall have a properly calibrated weighing instrument; and (iv) an LPG Cylinder Exchange Pool shall be established to regulate the exchange of LPG cylinders among the LPG enterprises.

- The Energy Act of 2006 contains additional regulatory provisions relating to licensing and safety standards for enterprises dealing with petroleum products, including LPG.

Nepal: Dedicated Government Agency Linking Microfinance Institutions With Solar Enterprises

The promotion of rural energy access in Nepal included the heavy involvement of government to influence and promote small-scale finance and energy access. In Nepal, the Alternative Energy Promotion Centre (AEPC), a government agency for implementing renewable energy programmes, undertakes a range of activities to link energy products with appropriate financing, including: (i) prequalification of the energy enterprises to supply quality products, microfinance institutions, and manufacturers, (ii) coordination with microfinance institutions for credit mobilization to customers, (iii) development of technical and service standards, (iv) issuance of subsidies, and (v) monitoring of the programmes. In the two cases presented here, the government's role is to bring together all the relevant issues discussed to deliver energy services to the poor.

In 1999, AEPC launched the Solar Energy Support Programme (SESP) within the framework of the Energy Sector Assistance Programme. Support for this programme came from an external donor (Denmark) and the main objective was to improve the living conditions of the rural population by enhancing their access to solar home systems. The government provides a 25 percent subsidy directly to the manufacturer, which in turn is passed directly to the consumer. The consumer pays the remaining 75 percent of the cost of the SHS with cash and/or loan. The programme is designed to cover the entire country and is expected to run through 2012. A number of solar photovoltaic (PV) enterprises selected by AEPC are responsible for promoting and installing solar home systems (SHSs) as well as providing after-sale service. By the end of 2007, 105,400 SHSs (40 watt systems) had been installed through this programme (Table 4).

Table 4: Solar Home Systems Installed through the Solar Energy Support Programme in Nepal

Year	Number of SHSs Installed
1992-1997	1,580
1998	1,899
1999	8,279
2000	6,211
2001	13,745
2002	18,482
2003	15,106
2004	17,887
2005	6,788
2006	6,696
2007	11,273
Total	105,400

Source: AEPC/ESAP 2006, 2007.

The SESP helped existing microfinance institutions build their capacity and link with solar enterprises selected by AEPC. The Agricultural Development Bank Ltd (ADBL) is the lead bank providing solar PV loans; by mid-July 2007, it had invested around USD 5.7 million to support the installation of 15,195 SHSs (Agricultural Development Bank, 2008). In addition, the Rastriya Banijya Bank (RBB) has invested approximately USD 625,000 to support the installation of 1,502 SHSs since 1998. For these two banks, some form of asset was required as collateral. For the remaining loans, microfinance institutions operating at the local level provided loans to users on their own terms and conditions, at varied interest rates and collateral requirements. Households with SHSs benefited from improved lighting, reduced expenditure on kerosene by about 4 litres a month per family, and improved health and sanitation conditions through a smokeless environment.

Main Lessons from the Solar Energy Support Programme in Nepal

Financing institutions have not been sufficiently engaged in providing credit for the purchase of SHSs, largely due to a lack of awareness. Campaigns on SHSs are called for mainly in rural and remote areas. Microfinance institutions are hesitant to bear the risk of lending for a technology they consider to be 'new', especially if the government would like to expand access to poorer customers without assets to pledge as collateral.

■ Box 3: Impact of the Solar Energy Support Programme in Rural Nepal

Mr. Surya Bhakta Pudasaini, a resident of Dandagaun village in Nuwakot district, received a loan of USD 327 (100 percent of the hardware cost) from the Agricultural Development Bank, Nepal, in 2004 to install a 40W capacity SHS in his house. The Branch Unit of AEPC pre-qualified the Solar Electricity Company, which did the planning and installation work. AEPC provided a subsidy of USD 141 to the user through the Company within the framework of the SESP.

The main result of installing the SHS has been saving about 4-5 litres of kerosene per month that would have been spent on a kerosene wick lamp. Moreover, the SHS has substantially helped the Pudasaini family; for example, women family members are breathing easier, especially in the kitchen, and Mr. Pudasaini said that the lighting facility has markedly increased their working hours. His children were able to study during evening/night time, and the family has been enjoying communication with the 'outside' through radio and television.

Source: L. Shrestha (personal communication)

After-sale service, especially in the remote areas, has to be assured for proper and continuous operation of the systems to ensure the timely payment of the loan. Poor performance of SHSs due to lack of proper maintenance support was reported as a major reason for defaults in loan repayments. An important lesson here is that there seems to be a strong correlation between the rate of loan recovery and the performance of the installed SHSs. Without effective collaboration among the AEPC, microfinance institutions, and solar enterprises, it is difficult to ensure that the enterprises provide quality installation and maintenance of the SHSs.

Nepal: Reducing Technical Risks and Transaction Costs for Biogas

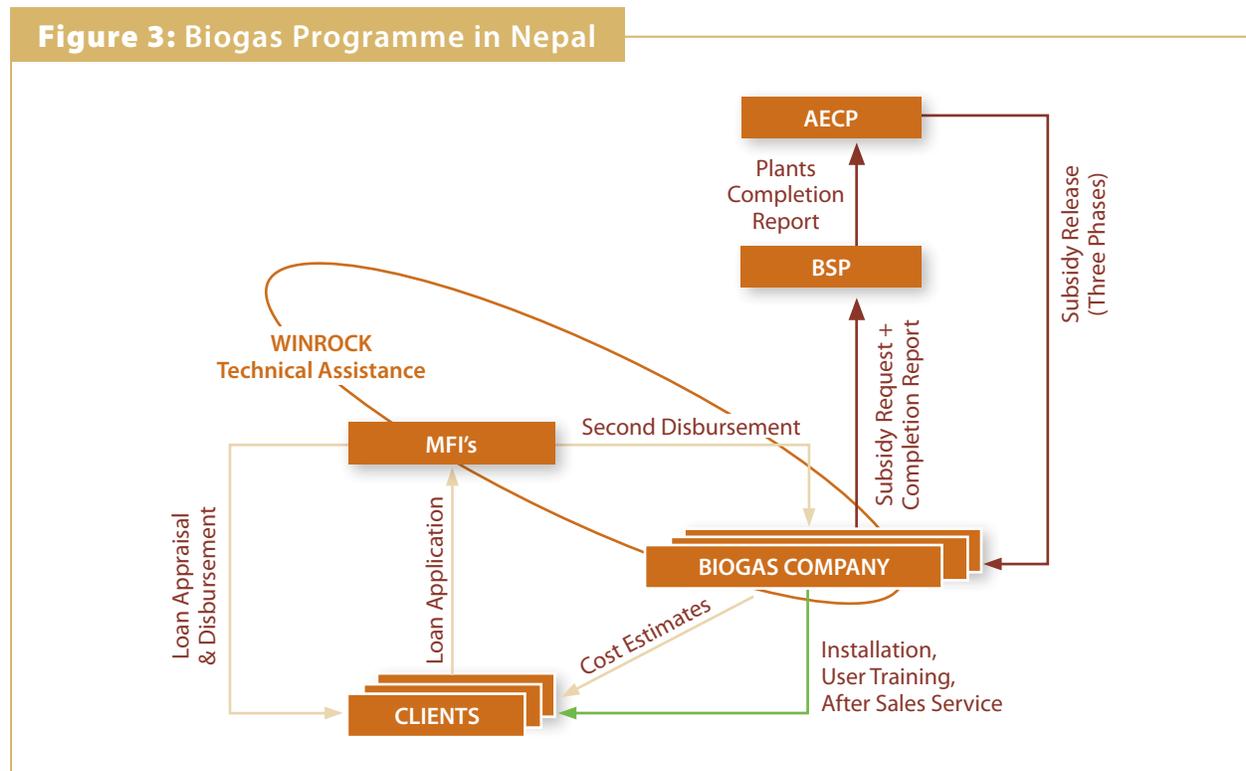
Demand for biogas in Nepal is on the rise. Biogas can be used for both cooking and lighting, and the slurry by-product resulting from its manufacture can be used as a fertilizer, an important source of improved agricultural productivity. Access to biogas can help save fuelwood and kerosene, while also eliminating indoor air pollution and improving the health and sanitation conditions of the users.

SNV/Nepal initiated the Biogas Support Programme (BSP) in Nepal in 1992 with the financial support of the Netherlands Directorate General for International Cooperation (DGIS), leveraging support from the Kreditanstalt fuer Wiederaufbau of Germany (KfW), which also provided funding to the BSP beginning in 1997. AEPC is the institutional host for BSP while the Biogas Sector Partnership-Nepal (BSP-N), a local NGO, is responsible for technical support and quality control for biogas implementation (Figure 3). BSP-N activities include vendor qualification, technology certification, capacity building, research, marketing/promotion, quality control, and endorsement of requests for subsidies from biogas enterprises. The programme is designed to cover all areas in the country that have potential for biogas and is expected to continue through 2009. As with the solar programme, a number of enterprises selected by AEPC are

responsible for system installation and maintenance. Through the partnership among AEPC, BSP-N, and the biogas enterprises, 162,505 plants had been installed by July 2007.

Originally, the Government of Nepal assigned the Agricultural Development Bank Ltd as the lead public institution to facilitate increased delivery of microcredit to rural areas and strengthened the National Cooperative Bank to complement ADBL's efforts. ADBL, the key financier for the biogas programme, directly financed most of the biogas plants at 10 percent per annum. By July 2007, ADBL provided loans amounting to USD 24.8 million, which supported the installation of 62,930 biogas plants. But as part of internal restructuring, the bank has been mandated to operate more as a commercial bank by issuing larger loans mainly because of the operating costs associated with lending relatively small loans are high. This has slowed financing from ADBL to the energy sector and resulted in microfinance institutions increasingly filling the gap.

To promote nationwide utilization of biogas in Nepal, the government (through AEPC) provides a price subsidy of 5,000–11,500 Nepalese rupees (USD 69–159) per biogas plant, depending on the size and location. The subsidy constitutes 25 to 45 percent of the total biogas plant cost and is available to all households installing biogas plants, regardless of income level. In addition, the government recently introduced an additional subsidy for poorer households (also targeted by microfinance institutions) to offset their inability to afford a biogas plants. However, even with this additional subsidy, poor households still pay 25 to 40 percent of the cost of a biogas plant, and they typically need financing for this portion. The price subsidies are approved by AEPC on recommendation of BSP-N and channelled through the biogas enterprises/manufacturers. In exchange, the biogas manufacturers must provide at least a 1-year guarantee to the consumer.



Source: Hilman et al. 2007.

In November 2000, KfW provided a grant of approximately USD 3.5 million to the Government of Nepal to set up a Biogas Credit Fund (BCF), whose goal is to increase access to small-scale finance required to support installation of biogas plants. AEPC, which received these funds from the government as a soft loan at 3 percent interest rate per annum, started administering it (i.e., wholesale lending) through 160 pre-qualified microfinance institutions at 6 percent interest rate per annum. By July 2007, the microfinance institutions have financed 7,734 biogas plant owners at 16 percent interest rate per annum, making a 10 percent margin on biogas loans. The BCF has supported about 8.3 percent of the total number of plants constructed in Nepal, a significant and increasing contribution. The BCF has a cumulative loan recovery rate of 92 percent, and the biogas enterprises have played a crucial role in motivating customers to repay biogas plant loans on time. Furthermore, the biogas enterprises have organized themselves into a Nepal Biogas Promotion Association (NBPA), with the objective of promoting biogas activities. The biogas enterprises have also set up Biogas Appliances and Accessories Workshops (BAAWs) that supply biogas appliances and related accessories (AEPC 2007).

Main Lessons from the Nepal Biogas Support Programme

Nepal continues to have large, untapped biogas market potential and the government continues to promote biogas in rural areas with efforts to make the overall policy environment favourable. The presence of BSP-N reduces the technical risks and transaction costs for institutions financing biogas in Nepal. This case shows that support by the government, in the form of targeted subsidies, makes a difference where the energy industry is not mature, the number and quality of reliable energy suppliers are limited, and the financial institutions lack technical knowledge to develop strategies to mitigate technical risks. Biogas subsidies are linked to quality, which ensures that the benefit trickles down to the customer and that funds are used efficiently. Biogas technology is also simple, proven, and mostly manufactured locally, which helps make expansion easy.

BSP has played a crucial role in accelerating the utilization of biogas systems for domestic purposes in Nepal. BSP has helped the country create strong market players and helped financial institutions minimize the potential technical risks associated with the performance of the biogas enterprises.

To reduce the cost of credit for biogas users, a number of microfinance institutions and biogas stakeholders suggest that the current interest rate of 6 percent paid by microfinance institutions to the Biogas Credit Fund should be reduced to 3–4 percent to reduce the interest rate charged to the consumer. Furthermore, it has been suggested that the current repayment period of 2–3 years should be increased to 3–4 years. These suggestions are based on the fact that biogas systems are seldom used for direct income generation and thus it can be difficult for poor families to pay back the loan within a short period.

Tanzania: Government Linking Small-scale Finance, Energy Enterprises and Reliable Service

The Promotion of Renewable Energy in Tanzania (PRET) programme was a 3-year (2005–07) bilateral collaboration between the Tanzanian and German government (Kolling 2007). The Tanzanian Ministry of Energy and Minerals (MEM) and the German international cooperation agency GTZ were jointly responsible for project implementation, including project design, coordination, monitoring, and conflict resolution. PRET operated in rural and peri-urban off-grid areas of the Arusha, Kilimanjaro, and Manyara regions, whose total population is approximately 6 million. PRET aimed to facilitate and support private-sector-led growth of the rural energy market in Tanzania by linking financing, energy enterprises, and service for customers.

To promote the adoption of solar home systems, PRET created a business model whose aim was to link four key players in the rural energy market: rural customers, rural energy technicians (*fundis*), rural energy service providers (RESPs), and rural financial service providers (RFSPs). RESPs (who in practice may be the same person as the technician) are energy entrepreneurs who link

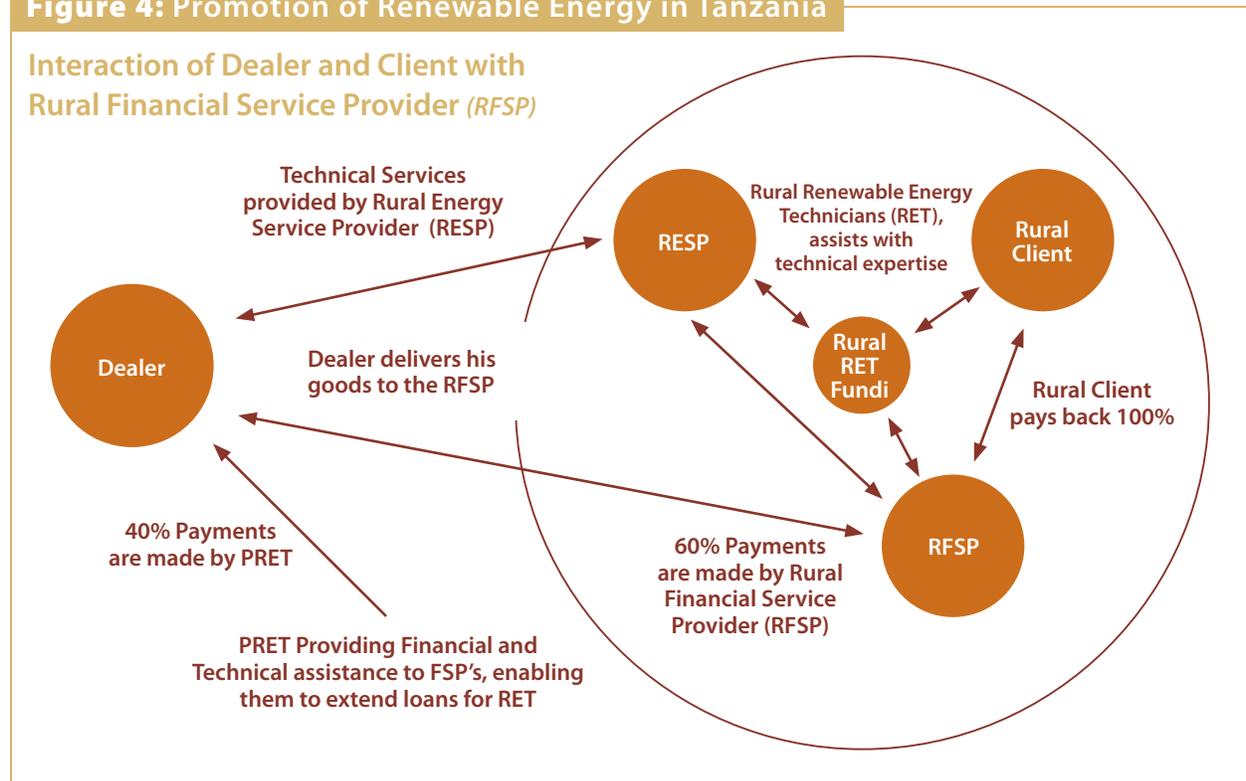
rural energy demand with the range of renewable energy products offered by energy dealers and vendors, which are mainly located in urban areas. RFSPs, on the other hand, are the institutions that provide credit to enable rural households and microenterprises to purchase the range of energy products and services offered by RESPs. In the case of PRET in Tanzania, SACCOs played the role of RFSPs. PRET selected a number of SACCOs to act as RFSPs to pilot this approach.

The credit model developed by PRET was designed to work as shown in Figure 4. First, either a RESP or *fundu* initiated the sale of a solar home system by making contact with a potential rural customer. Once a customer placed an order for a SHS, the RESP assisted the customer in applying for credit from the relevant RFSP (i.e., one of the several SACCOs selected by PRET to offer credit for SHSs). Once the loan was approved, the RESP received a loan covering 60 percent of the total system cost from the SACCO, inclusive of installation cost. Upon installation and on-the-ground

verification of the system's performance by PRET, the RESP received the balance of the payment (i.e., 40 percent of the total) from PRET. The RFSP would, in turn, recover 100 percent of the system cost, inclusive of interest, from the customer. The loan recovery period was set at 1 year.

The rationale for requiring 100 percent loan recovery from customers was to enable the RFSP to offset the 60 percent paid out to the RESP while retaining the balance of 40 percent as a 'revolving fund' to encourage further lending for SHSs. The 40 percent could also be used as a 'guarantee fund' to cushion the RFSP against any defaults in loan recovery. The average system size available under the PRET credit scheme was 60 W, at a cost of approximately USD 900. This level of cost and the 1-year repayment term is out of reach for the poorest in the communities, who typically need longer loan terms that are matched to their income.

Figure 4: Promotion of Renewable Energy in Tanzania



Over the 3-year period (2005–07), PRET contributed to the dissemination of over 750 SHSs through the credit scheme and cash sales. During this period, 18 SACCOs participated in the credit scheme for SHSs. The SACCOs benefited in a number of ways, including access to capital for making energy loans, capacity building as a result of training in lending procedures and energy products, and increased revenue from interest repayments on energy lending. Employment opportunities have been created for the locally trained technicians and dealers who installed the systems and continue to provide after-sales service. Additionally, PRET promotional messages on SHSs reportedly reached about 20 percent of households in Arusha (Kolling 2007). Nearly 400 additional SHSs were installed through PRET, using the same scheme, within a short project extension window of about 6 months (i.e., up to June 2008), reflecting the potential of this credit scheme model.

Main Lessons from the PRET Programme in Tanzania

The government played an important role in the PRET programme in at least two ways. First, PRET was a bilateral collaboration between two governments, and therefore required the direct involvement of Tanzania's government to negotiate and secure funding and cooperation from Germany. The funding secured through this bilateral cooperation was an important source of technical and promotional support delivered through PRET. Access to government subsidies, in turn, was important in helping households purchase larger systems that enabled them to realize socioeconomic benefits from improved lighting. Not only has the credit scheme contributed to more SHS sales, but along with experience from other countries (notably Kenya), it demonstrates that the average size (60 W) of the SHSs sold under the PRET scheme is larger than rural households could otherwise afford through the unsubsidized cash market.

Second, because the government partnered with PRET, the potential for sustaining and scaling up the programme was increased. In other words, leveraging existing government technical expertise

and institutional structures appears to enhance the prospects of the project's sustainability while building the capacity of local institutions. For example, the government's Ministry of Minerals and Energy is prioritizing access to finance for energy through the Renewable Energy Agency (REA), which was set up in 2007. REA also has a budget for boosting the energy sector and is in process of identifying partners with whom to implement programmes aimed at financing a wide range of renewable energy technologies (RETs), including solar PV, biogas, and wind technology. The REA has expressed interest in further supporting the financing model initiated by PRET. Allocation of more funds and resources by REA to sustain the PRET model would expand the government's role in increasing access to small-scale energy finance. It is also worth noting that the project outputs (e.g., training manuals, information booklets, advertising material) have been made available to other stakeholders (e.g., REA) for use in future promotion campaigns for SHSs and other rural energy technologies.

Tanzania: Commercially-Driven Solar Financing Model

FINCA Tanzania, a microfinance institution operating as a limited company in Tanzania, is an affiliate of the Washington D.C.-based FINCA International. FINCA Tanzania provides a wide range of financial services, including small business loans, to its customers in both urban and rural areas. Solar home system (SHS) loans were developed in response to demand from its customers and were seen as important to FINCA's mission to improve the social and economic conditions of its customers.

The SHS sizes available under the FINCA project were determined in partnership with Umeme Jua, a local solar energy enterprise. The systems ranged in size from 14 W to 60 W, and Umeme Jua supplied and installed the solar systems, while FINCA Tanzania provided the loan. The SHS loan was designed as a 9-month pilot project in the Morogoro region, with plans to replicate it and scale it up based on the pilot. Umeme Jua was paid upfront and in full by FINCA Tanzania prior to system

installation, with the idea that the microfinance institution would bear all the project risk. FINCA Tanzania borrowed loan capital from the Triodos Fund³ to finance the pilot phase. Triodos also provided some grants for technical assistance, which went into training the FINCA Tanzania loan officers on the basics of a solar PV system.

Over the 9-month pilot phase, the FINCA project managed to install only four systems against an initial target of 200 systems. At the time (2003–04), FINCA served a rural/semi-urban population of at least 20,000 families, thus the impact of the pilot test was limited. The pilot phase was not continued due to high transaction costs, which made this phase unsustainable. The high transaction costs reported included training loan officers and hiring marketing agents tasked to conduct promotional meetings in rural areas.

Main Lessons from the FINCA Tanzania Solar Energy Financing Project

A critical analysis of the FINCA solar energy financing project reveals a number of weaknesses inherent in the design and delivery of this otherwise-promising initiative. First and most obvious is that the pilot phase timeframe of 9 months was too short; shorter than even the loan repayment period of 1 year. Second, restricting the pilot project to one region (Morogoro) and relying on only one energy enterprise (Umeme Jua) for implementation was also a shortcoming. Third, making a full, upfront payment to the dealer prior to full loan recovery reduced the economic incentive of the enterprise to make quality installations, let alone deliver timely after-sale service.

In terms of the role of government, it is helpful to take a retrospective look at the lessons learnt from the PRET model and apply them to the FINCA project (retrospective because the FINCA preceded the PRET programme). Actively seeking government involvement and participation, as in the case of PRET, appears to be in the long-term interest of a project aiming to increase and secure long-term access to small-scale finance for energy. Analysis of the FINCA pilot project suggests that

the design and delivery of this initiative—and hence its scale of access and impact—could have benefited greatly from active engagement and partnership with relevant government departments, such as the Ministry of Energy and Minerals, to create an envelope of support. It is likely that more direct and active involvement from the government could have provided the necessary support for training and promotion activities, thus making the energy loan more accessible to the rural poor.

Key Findings

1. Small-scale finance can help expand access to modern energy services for the poor

Small-scale finance for poor men and women has the potential to trigger several key impacts for modern energy services. Small-scale finance, in the context of this paper, refers to small loans, credit, and other financial products provided to individuals, households, and businesses that are tailored to low-income people. The most important impact is that with access to small-scale finance, it is possible to consider a range of energy options that may not have been available without financing. With small loans, it is possible to have many options (usually cleaner and higher quality) for the customer to choose from, rather than limited only to energy systems they can afford on a cash basis. However, in the interest of loan recovery, the best results are realized when loan payments closely match existing energy expenditures or income flows. Second, there are numerous collateral benefits from opening up financing channels for modern energy. The poor can improve their livelihoods by having cleaner, brighter light for work and study; they can quickly see improvements in their health and health services; it is possible to have extended hours for small businesses to operate and therefore increased incomes; there is improved productivity and job creation; and people have increased personal security. Moreover, with small-scale finance, people are often able to afford a loan for a larger energy

³ Part of the Triodos Bank network, headquartered in the Netherlands.

system that can result in even more gains in productivity for home-based enterprises and small businesses.

In Kenya, the micro-hydropower project led to low-cost electricity (USD 0.15/kWh) and higher quality and more diversified energy services (including lighting and power for radio and television). This was a cheaper unit cost compared to the commonly used automobile batteries (USD 5/kWh) and it also displaced the use of kerosene, an indoor air pollutant. In Nepal, the solar programme reduced expenditures on kerosene by about 4 litres per month per family. These observations are consistent with numerous studies showing the poor spend a large proportion of their income on energy due to a combination of the fact that they typically use low-quality energy fuels (e.g., fuelwood) and inefficient end-use devices (e.g., three-stone-fireplace) (Karekezi et al. 2002).

2. Design of small-scale finance programmes can have an important impact on outcomes

Depending on the particular design of a small-scale financing scheme, it is possible to see very different outcomes. A number of different models for energy lending that can successfully address the needs of the poor, but it is important to determine what model fits the particular context of the financial institution and the needs of the client. For example, in designing a successful small-scale finance programme for energy, financial institutions need to carefully analyze the customer demands, cash flow of the customer, energy usage patterns, and the social and economic dimensions of the community. The client needs to be offered modern, high-quality energy products that are easy to maintain from reliable enterprises and that also help improve productivity and alleviate the physical burdens associated with traditional fuels. Most important, the loan repayment needs to be tailored to the sometimes-irregular incomes of the poor (e.g., agriculture-based income that comes in at harvest time) and at terms that are sufficiently long (e.g., 1-2 years for a solar home system) to ensure loan repayment.

In Tanzania, the pilot project done by FINCA had limited impact because of problems in the design and delivery of the programme. One key design flaw was that the nine-month timeframe of the pilot phase was shorter than the maximum loan repayment period of one year. The time lag created problems in terms of sustainability and scale-up. Second, the energy enterprise was paid upfront by the microfinance institution prior to full loan recovery, which reduced the economic incentive of the enterprise to make quality installations and provide timely after-sale service.

3. Small-scale finance for energy makes good business sense for financial institutions serving the poor

On the one hand, small-scale finance helps to expand access to modern energy services and promote the productive use of energy, and on the other hand, lending for energy appears to make good business sense for the financial institutions. What is holding back the expansion is the perceived risk that the financial institutions are seeing with regard to the technologies and the delivery models. Energy technologies are not well understood by financial institutions and therefore it is essential to have a reputable energy enterprise supplying a high-quality product that is backed up with reliable service. This is most important in the rural areas, where there is a lack of awareness of different options and misperceptions about technologies appropriate for rural areas. Once these preconditions are met, it is clear from the experiences highlighted in the paper that financial institutions can improve their bottom line, increase the number of people with access to modern energy, and encourage the creation of new energy entrepreneurs.

In Kenya, the Liquefied Petroleum Gas (LPG) lending programme has been a significant source of revenue for the Business Development and Marketing Department of the Kenya Union of Savings and Credit Cooperatives (KUSCCO), accounting in some years for 60 to 90 percent of the total revenue as a result of the margins taken at various places in the value chain. In another example, the Government of Nepal gave a soft

loan (at 3 percent interest per year) to the Alternative Energy Promotion Centre (AEPIC), which administered the Biogas Credit Fund through 160 pre-qualified microfinance institutions at 6 percent interest rate per year. The microfinance institutions issued biogas loans at an interest rate of 16 percent, making a 10 percent margin.

4. Convergence between policies relating to energy and small-scale finance leads to improved access to affordable, modern energy services for the poor

A wide variety of policies—including a public mandate, a more market-based approach, or an NGO advocating a development agenda—can prompt expanded access to energy through small-scale finance. When there is convergence between policy objectives relating to expanding access to small-scale finance and those focused on energy access, delivery of modern energy services for the poor is improved. With government incentives in place and demonstrated leadership, it is possible to link the policies coming from the two different sectors to reinforce their mutual goals of making modern energy affordable and available for the poor.

The micro-hydropower project in Kenya demonstrated that efforts to remove policy, institutional, and technical barriers constraining investment in low-cost, off-grid rural micro-electric-grids are essential. Moreover, when end users had access to small-scale finance, they were able to pay the upfront costs associated with micro-hydropower. In Nepal, there were targeted subsidies for alternative energy programmes integrated with small-scale finance. This involved training energy enterprises and financial institutions (e.g., microfinance institutions and rural savings and credit organizations) on effective delivery and developing and enforcing technical and service standards for the energy systems. The Promotion of Renewable Energy in Tanzania (PRET) programme linked rural energy enterprises with rural financial institutions to get solar home systems, with financing, in the hands of the poor. The government, through the Ministry of Energy and Minerals, was actively involved in the design of the programme and created crucial institutional incentives and networks to help launch the PRET programme.

□ Conclusions

It is in the governments' best interest to facilitate the expansion of small-scale finance to help the poor purchase modern energy systems because this helps meet the objectives of poverty reduction, rural development, job creation, and improvements in health, education, and gender equity. This report shows very clearly that no single action or approach is suitable for all countries.

Governments need to identify the necessary actions, define their roles, and execute them in a way that incentivizes financial institutions (e.g., microfinance institutions, savings and credit cooperatives, community-based organizations, or commercial banks) and makes them willing to issue loans for modern energy.

The examples from Burkina Faso, Kenya, Nepal and Tanzania illustrate the most important rationale for linking modern energy to small-scale finance for the poor—the opening up of new options. There is no reason that the poor should continue to spend a large share of their incomes on low-quality energy services. With access to small-scale finance, it becomes possible to put modern, cleaner, and more efficient options in reach of the poor. This involves linking access to finance with access to energy, in a seamless fashion, with government laying the foundation through enabling policies, information, and financing.

This report recognizes the importance of small-scale finance, but more importantly emphasizes the need to understand how small-scale finance is done for modern energy. Depending on the design features of the lending scheme and the quality of the information used to build the programme, it is possible to have very different outcomes, including failure. Governments can play a role in making sure that lessons learnt are shared and learning from mistakes is encouraged.

The report also shows that not only is it possible for households and small businesses to build their incomes and assets with access to small-scale finance, but also that there is an excellent business opportunity for financial institutions and energy enterprises. An information and knowledge gap is holding them back from initiating or expanding

into small-scale finance for modern energy. The experiences on the ground are out there, albeit still limited at this point, but the lessons and best practices are not necessarily reaching the practitioners who need them. Governments can play a wide range of roles, including bringing reliable information to the forefront, providing advocacy, supporting business development services, and fostering links between financial institutions and energy enterprises.

Finally, the report describes how once the policy, institutional, and technical barriers are removed, investment is more likely to happen, and innovation on delivery models can take place. Access to modern energy services will grow at a higher rate in countries where governments have pro-active policies and regulations and simultaneously facilitate the entry of new players and new models for small-scale finance directed at energy.

A set of four concrete recommendations for policy-makers and practitioners emerged from the case studies in Burkina Faso, Kenya, Nepal and Tanzania:

- *Analyze the current situation on small-scale finance for modern energy services*
- *Create enabling conditions for linking small-scale finance options with national rural energy programmes and policies*
- *Facilitate partnerships to strengthen financial institutions and energy enterprises serving the poor*
- *Support and strengthen monitoring, evaluation, and disclosure of energy lending portfolio performance, impact, and growth*

These recommendations centre on the creation of knowledge and awareness of small-scale finance for energy and the expansion of energy policies, programmes, and budgets to incorporate small-scale finance. They also point to the need to focus on enabling business relationships between financial institutions and energy enterprises, allowing these entities to thrive and finally begin to adopt more rigorous monitoring and disclosure of lending practices and performance for small-scale finance for modern energy.

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