



NOVEMBER 2007

Using Microfinance to Expand Access to Energy Services:

The Emerging Experiences in Asia of Self-Employed Women's Association Bank (SEWA), Sarvodaya Economic Enterprise Development Services (SEEDS), Nirdhan Utthan Bank Limited (NUBL), and AMRET



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Citi Foundation



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This paper is made possible by the generous support of the Citi Foundation and by the American people through the United States Agency for International Development (USAID). The contents are the responsibility of The SEEP Network and Sustainable Energy Solutions and do not necessarily reflect the views of the Citi Foundation, USAID, or the United States Government.

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ACKNOWLEDGMENTS

The SEEP Network, Sustainable Energy Solutions, and the research teams that carried out this research would like to express their profound respect and appreciation for the microfinance institutions and energy companies and individuals that participated in the research in Asia:

AMRET (Cambodia): Chea Pallarin and Hout Soukha

Sat Samy (Ministry of Industry, Mining and Energy), Iwan Baskoro (GERES Cambodia), and Jan Lam (National Biodigester Programme)

NUBL (Nepal): Prakash Sharma, and Prabin Dahal

Saroj Rai (Biogas Sector Partnership of Nepal), Alternative Energy Promotion Center of Nepal

SEEDS (Sri Lanka): Indrani Hettiarachy

Pradip Jayawardena (Solar Industries Association, SIA), Shell Solar Srilanka, HPI Solar/ENCO, RERED Project, DFCC, Energy Forum

SEWA Bank (India): Jayshree Vyas and Sharmila Davra

Harish Hande (SELCO)

These organizations and individuals generously shared their time with us, demonstrating commitment, creativity, insight, and patience through the entire process, especially the field research. They also demonstrated a keen desire to further industry knowledge and practice by sharing their experiences, successes, and missteps in using microfinance to provide access to energy.

We are grateful to the funders of this research, the Citi Foundation and the U.S. Agency for International Development (USAID), for their support for this research and their willingness to advocate for the potential of using microfinance to expand access to energy services in the broader microfinance and energy services communities. In this regard, we are particularly thankful to Leslie Meek of the Citi Foundation and Patricia Flanagan and Simone Lawaetz of USAID.

This research benefited from an advisory group, comprised of individuals from the energy and microfinance sectors, who provided voluntary technical advice and guidance at key junctures. We are especially grateful to Harish Hande (SELCO), Phil LaRocco (E+Co), Erik Wurster (E+Co), Nicola Armacost (Women's World Banking), Jennifer Hansel (Research Triangle Institute), and Evelyn Stark (Consultative Group to Assist the Poor), who generously shared their time with us, demonstrating commitment, creativity, and insight through the course of this work. We would like to thank Amy Feldman from Citi Foundation for supporting the planning of the August 2007 workshop where this paper was presented and Ida Dokk Smith from SEEP for assisting with the project.

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ABBREVIATIONS

ACLEDA	Association of Cambodian Local Economic Development Agencies
ADB	Asian Development Bank
ADBL	Agricultural Development Bank Limited
AEC	Ahmedabad Electricity Company
AEPC	Alternative Energy Promotion Centre
AFD	Agence française de développement
AM	area manager
AO	area office
APR	annual percentage rate
BO	branch office
BOD	board of directors
BPL	below poverty line
BSP	Biogas Sector Partnership
CBOs	community-based organizations
CBSL	Central Bank of Sri Lanka
CEB	Central Electricity Board
CFSP	Cambodian Fuelwood Saving Project
DANIDA	Danish International Development Agency
DFCC	Development Finance Cooperation of Ceylon
DMs	district managers
ECS	electricity co-operative society
ESD	energy services delivery
FAO	Food and Agriculture Organization
FCRA	Foreign Contribution Registration Act
FD	fixed deposit
FINGO	financial intermediary non-government organization
FONDEM	La Fondation Énergies pour le Monde

FY	fiscal year
GCC	general credit card
GDP	gross domestic product
GEF	Global Environment Facility
GERES	Énergies Renouvelables Environnement et Solidarités
GHC	grievance hearing cell
GL	general loan
GM	general manager
GNI	gross national income
GSL	government of Sri Lanka
GTZ	Gesellschaft für Technische Zusammenarbeit
HNB	Hatton National Bank
HPI	hydro power
HO	head office
HR	human resources
IRDP	Integrated Rural Development Programme
IREDA	Indian Renewable Energy Development Agency Limited
JFPR	Japan Fund for Poverty Reduction
KfW	Kreditanstalt für Wiederaufbau
KS	Khmer Solar
KVA	kilovolt ampere
KWh	kilowatt hour
LAN	local area network
Libor	London Inter-bank Office Rate
LLR	loan loss reserve
LPG	liquid petroleum gas
MACS Act	Mutual Aid Co-operative Acts
MAFF	Ministries of Agriculture and Fisheries
MBW _{in}	MicroBanker
MCPW	Microcredit Project for Women
MFDB	microfinance development banks
MFI _s	microfinance institutions

MHT	Mahila Housing Trust
MIME	Ministry of Industry, Mines, and Energy
MIS	management information systems
MNCE	Multi-National Collaboration Environment
MOU	memorandum of understanding
MSD	Microfinance Supervision Department
MW	megawatts
NBC	National Bank of Cambodia
NBFC	non-bank finance companies
NBL	Nepal Bank Limited
NBP	National Biodigester Program
NEA	Nepal Electricity Authority
NEG	New Energy Group
NGOs	non-government organizations
NPL	non-performing loan
NRB	Nepal Rastra Bank
NUBL	Nirdhan Utthan Bank Limited
p.a.	per annum
PCI	participatory credit institution
PCRW	Production Credit for Rural Women
PO	program officer
PV	photovoltaic
RBB	Rashtriya Banijya Bank
RBI	Reserve Bank of India
REB	Rural Electrification Board
REDP	Rural Energy Development Program
REE	rural electricity enterprises
REF	Rural Electrification Fund
REFS	Rural Electrification Fund Secretariat
REPSA	Renewable Energy Private Sector Association
RERED	Renewable Energy for Rural Economic Development
RFSDA	Rural Finance Sector Development Agency

RGC	Royal Government of Cambodia
ROA	return on assets
RSRF	Rural Self-Reliance Fund
SACCOS	saving and credit co-operatives
SCARDB	state co-operative agriculture and rural development banks
SEB	state electricity boards
SEEDS	Sarvodaya Economic Enterprise Development Services
SEEP	Small Enterprise Education and Promotion Network
SELCO	Solar Electric Light Company
SES	sustainable energy solutions
SEWA	Self-Employed Women's Association
SFCL	Small Farmer Co-operative Limited
SG	solidarity group
SHG	self-help group
SHS	solar home system
SIA	Solar Industry Association
SIDBI	Small Industries Development Bank of India
SPV	solar photovoltaic
SRTS	Sarvodaya Rural Technical Service
SWH	solar water heater
TA	technical assistance
TCCS	thrift credit co-operative societies
TOE	ton of oil equivalent
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNF	United Nations Foundation
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VA	village association
Wp	watt peak

EXECUTIVE SUMMARY

BACKGROUND

There is no question that microfinance and consumer lending can improve access to quality modern energy services for poor consumers. Such loans help offset the high upfront cost associated with cleaner technologies, such as biogas, micro hydro power, wind, solar, or liquefied petroleum gas (LPG). To date, an overwhelming majority of financial support for rural energy applications has been publicly funded. Although these programs are beneficial, increased access to loans for consumers is essential to engage the private sector, improve the investment climate for rural energy services, and leverage the outreach and impact. A deeper understanding of the business opportunities for small-scale lending for energy services, as well as the most effective way microfinance institutions (MFIs) can respond to these opportunities, will facilitate access to appropriate financial services.

The potential for MFIs to offer profitable loans for the purchase of energy services has not yet been realized because both the energy and microfinance fields lack experience and there are few documented successes to learn from. In order to better understand the current experience with energy lending in this emerging arena, the United States Agency for International Development (USAID) and the Citi Foundation are funding a comprehensive study on the opportunities, barriers, costs, and impacts associated with MFI lending portfolios that have integrated energy into their products. The approach is to learn from detailed profiles of the business models, the clients, and the operations of selected MFIs that currently have energy lending programs.

This action research project, *Using Microfinance to Expand Access to Energy Services*, looks at energy lending on three continents—Asia, Africa, and Latin America. The objective is to document the opportunities, challenges, costs, and effects of integrating energy products into a MFI's product mix, develop feedback for future expansions of these energy-lending products, and share the lessons learned with the industry at large. The study in the Asia region examined in depth four existing MFI energy-lending programs through field work and a desk/literature review. The field research included interviews with selected staff of the MFIs, energy suppliers, clients, and other energy stakeholders, and analysis of the MFIs' lending programs and financial and accounting reports. The MFIs studied are SEWA Bank (India), SEEDS (Sri Lanka), NUBL (Nepal), and AMRET (Cambodia).

The findings reveal that each MFI has its own competitive edge that gives it a unique position, a wide array of best practices and lessons learned that can benefit other MFIs, and schemes and mechanisms that are most appropriate to their respective contexts. The country context of each country in the study has significant influence on the implementation and the market potential of energy lending by MFIs. For a summary of the research findings, which compares the features of the four MFIs, see Appendix 1.

OBSTACLES

Both internal and external obstacles were faced by the MFIs in this study in implementing energy lending. Those arising from factors within the organizations have been classified as internal, while the others are external factors.

The researchers identified reservations about making a group-based lending model available to clients who were not already members (i.e., completed successful loans), as seen in the case of NUBL. No barriers were identified for individual lending models. Weaknesses seen in the management information systems and credit discipline by field staff

have implications for financial performance and may restrict growth of the energy portfolio. Weak portfolio quality results in sub-optimal yields and may jeopardize the long-term sustainability of a program. Unfamiliarity with alternative energy options, the need for initial market development before energy-product introduction, and uncertain sustainability of the financing models for energy options were found to be issues. Although none of the MFIs studied had fund constraints, this could be a limiting factor for other smaller MFIs operating in the region.

Some of the typical obstacles arising from a country's policy environment included potential market distortions from subsidized technology-driven programs—e.g., government subsidy for solar cookers in India, credit-enhancement schemes offered by the government to select financial institutions (often favoring state-owned banks), and national energy and electricity price subsidies which are not also available for renewable/cleaner energy technology.

The market for energy lending may become limited if the potential from poor consumers is not aggressively developed and does not grow. For AMRET, energy technology options in Cambodia are not yet readily available; and NUBL's only option thus far is biogas. The absence, too, of sufficient numbers of energy players with decentralized sales and service networks, that can deliver better and more cost-efficient technology, will definitely hamper expansion of energy lending by MFIs. AMRET faces this condition, which is made worse by the general lack of awareness of energy options (much less lending products) by the Cambodians themselves.

Absence of interactions between the energy and microfinance sectors—particularly if they do not understand the limitations and potentials of each other's fields—can also be a significant obstacle to expanding energy lending both in micro- (MFIs) and macro- (country) economic contexts.

MARKET POTENTIAL

The market potential for energy lending by MFIs in the countries studied is huge, particularly because the electrification rate among poor and rural consumers is still low. For example, there are 2 million un-electrified households in Sri Lanka (with 10 percent annual growth in electricity demand), which are primarily located rural and estate areas and constitute a large potential market for energy lending.

In general, the market potential for energy lending by MFIs can be influenced by policies, markets, clients, geography:

Policy environment: If electricity prices are *not* subsidized (India and Cambodia), and the policy environment supports and promotes energy lending and market development (Sri Lanka's RERED project and intervention in Nepal by AEPC/BSP), the market potential is gigantic.

Market demand: The gap between energy supply and demand reflects market potential. In Nepal, the market potential for biogas plants has been estimated to be to 1.9 million units, and only about 160,000 units have been installed.

Existing client base: SEWA Bank and NUBL are strategically using their existing, relatively large client bases as the primary targets for energy lending. About 50 percent of NUBL clients obtain cattle loans, which is a ready-and-waiting market for biogas loans. The premise is that every MFI client has energy needs, and there are markets for more cost-efficient or revenue-generating technology.

Geographical coverage: MFIs with wide geographical presence are better placed to capture the latent demand for energy services.

POSSIBLE COLLABORATIONS

Based on the four MFIs in this study of the Asia region, possible collaborations for expanding energy lending lie among MFIs, energy suppliers, and energy sector facilitators, where each complements the other to expand energy lending. These collaborations include:

- Aligning energy lending with other livelihood programs that require energy provision, such as housing loans and business loans;
- Aligning energy lending with business development programs that require energy for income-generating activities;
- Aligning with NGOs or sector facilitators to source field proven, cost-efficient energy technologies that can be scaled up to commercial levels through a credit facility; and
- Tapping into credit enhancement and technical assistance schemes offered by sector facilitators (government, donors) to surmount challenges encountered in the initial introduction of energy lending, as done by SEEDS.

REPLICATION

The energy-lending models of the four MFIs have the potential to be replicated, but replication must take into consideration prerequisite conditions and the specific country context, which are key for each model to function well. Selecting from the best practices gleaned from the MFIs studied, choosing those aspects that are most suitable to a given situation offer the best option for replication, rather than mimicking just one model.

SEWA Bank: SEWA Bank's energy-lending model has the most pro-consumer approach and poses the fewest barriers to the economically active poor. Thus, it is an ideal model to increase the access of poor consumers to modern energy sources. SEWA Bank's extensive involvement in market development led it to tap into the existing marketing infrastructures and channels, without which marketing costs would be significant. In addition to other prerequisites, replicating this model requires an energy partner which shares a similar mission, approach, and target clients as the MFI, and which is willing to balance social, commercial, and environmental bottom lines.

SEEDS: The SEEDS energy-lending program constitute is the oldest and has the widest geographical coverage and biggest portfolio. Along with other prerequisites, replication of this model requires strong government policy, strong sector facilitators and energy suppliers, and decentralized sales and service networks.

NUBL: NUBL is relatively new and has a small portfolio. Its energy-lending shows a healthy potential to expand. NUBL's energy loan has a unique feature: it allows energy loans to be paired and run concomitantly with other loans (e.g., for purchasing cattle and upgrading sanitation), which complements the expansion of biogas loan market among its client base. With other prerequisites, replication requires strong government policy, strong sector facilitators and energy suppliers, standard and field-proven products, and decentralized marketing and service networks.

AMRET: AMRET's energy-lending product is the only one that is a general business loan and not a special loan product. Its potential is limited because Cambodia's energy sector is still immature. Replication would require strong management commitment to an internal research and development (R&D) division in order to understand its clients' energy needs and to identify energy suppliers to collaborate with them. Nevertheless, AMRET provides a good example of an MFI operation with a strong loan appraisal system, good credit discipline, and good internal procedure for research and development.

CONSIDERATIONS FOR SUCCESSFUL ENERGY LENDING

Challenges for MFIs

Each MFI examined in this study needs to carefully assess its cost structure, increase the efficiency of its operation, and scale up its market to achieve a critical mass. Without addressing these matters, the sustainability of their energy-

lending products may become very challenging. The success of energy lending by MFIs also depends on management capability, which includes:

- designing and customizing energy loan products to service the varying needs of clients;
- collaborating with external agencies to enhance strategic strengths, minimize risks, and broaden the service base;
- adopting professional management systems to enhance transparency and accountability;
- having the flexibility to accept risk, experiment, and adapt to change; and
- balancing commercial and social objectives.

Subsidies and proficiency in energy technology are two other factors that influence the introduction and development energy lending by MFIs. The supply-side subsidy for some energy products helps reduce the gap between the market price and affordability by consumers. These subsidies have proven effective in promoting the implementation of clean energy in countries, such as in Nepal for domestic biogas plants, and in Sri Lanka for solar home systems (SHS) and village micro hydro schemes.

As demonstrated by SEWA Bank and SEEDS, finance institutions can master the energy technology piece to benefit their clients. A bank's proficiency in the nature and characteristics of the energy technology can enable it to design an appropriate technical-risk mitigation strategy; craft robust product and service standards for the energy suppliers; construct an effective marketing strategy; monitor the product and service delivery by the energy suppliers; and actively disseminate comprehensive information to prospective customers.

The demand for better energy solutions can mostly be found among the very poor or hardcore poor populations, which most MFIs have still not been able to serve. This segment of society requires comprehensive, packaged support before its citizens can join mainstream microfinance programs. The expansion of energy access to the poor requires designing special programs which provide the poorest of the poor handholding support for longer duration, not just with credit but with a variety of other economic and social inputs.

Strategic Conflict

Adopting and introducing special loan products, such as energy lending, requires strategic decisions by the MFI, especially when there is a potential conflict of priority between promoting a general credit program and an energy program. An energy program requires larger loans with longer terms, which for most MFIs means higher credit risk.

With commercialization, MFIs seek to attain profitability in a short-to-medium time frame, which demands fast portfolio growth. However, energy lending cannot be expected to be as fast-paced as generally sought, given the need for marketing, client education, and staff training. Other possible hiccoughs are longer product "gestation periods" (for example, construction of a biogas plant takes 20 days), seasonality (no construction is possible during monsoons), or the unfeasibility or unsuitability of certain locations for certain energy products (such as hilly regions or regions with less sunlight), etc.

Opportunities for Donors

Strategic intervention by donors to promote micro-lending for energy consumers should combine financial support with strong technical assistance that has a pragmatic focus on building market infrastructure and market awareness. Financial support could assist MFIs during the start-up phase of energy lending to fill in any mismatch between the MFIs' loan policy and the borrowers' financial capacity and characteristics. It could enable the bank to lower its equity

financing requirement, extend the loan period (for example, micro hydro needs three years), provide a grace period, or reduce collateral requirements. It could also help with transaction cost sharing, credit enhancement schemes (i.e., performance-based interest rate subsidy or refinancing for longer tenure or grace period), or risk mitigation schemes (i.e., credit guarantee facility and loss reserve funds). Specific loan funds could be made available to local energy companies and enterprises and for energy delivery models that reach out to potential consumers who may not be bankable.

Areas for technical assistance that advance successful energy lending can be market studies to target the existing client base of the finance institution, technical standards for product and service quality to be imposed upon energy vendors by partner finance institutions, energy-lending program design, and supply chain development.

Opportunities for MFIs and Other Market Players

Micro-lending for energy consumers opens up great potential for MFIs to expand business beyond their existing client base. However, proficiency in energy technology and interactions with energy sector players are fundamental elements for designing effective energy-lending programs with good loan portfolio quality.

The global initiatives to utilize micro-lending for small scale, decentralized, or individual energy products as strategic means of expanding access to modern energy services also provide opportunities for energy market players to tap into a critical customer mass. Greater availability of micro-lending will help remove the barrier to poor consumers posed by their inability to afford modern, efficient energy. Furthermore, micro-lending facilities are key for energy players in building markets that justify investment in developing decentralized sales and service networks.

As shown by the four MFIs in this study, initiatives to foster development of micro-lending for energy consumers can come from any stakeholder as long as collaborations with other key stakeholders are established. The URJA Project of SEWA Bank and SELCO demonstrate a successful collaborative energy-lending project between the MFI and its energy partner. The RERED project in Sri Lanka and the AEPC/BSP partnership in Nepal are examples of government and donors combining to promote energy lending by MFIs. The Solar Industry Association of Sri Lanka is a perfect example of how solar companies can actively develop and foster an enabling environment by soliciting government policy and support to create a strong market for the photovoltaic industry.

RECOMMENDATIONS

Strong coordination among relevant stakeholders. Good coordination helps leverage the market scale, minimize market distortion, and increase efficiency, creating a vibrant market system.

Innovative market development. This includes diversifying the target consumer and the delivery model, and optimizing the client base as the primary target market.

Technology selection. Energy products need to be market driven and should contribute to cost efficiency and/or revenue generation, as well as have positive health and social impacts.

External funding for research, market promotion, and introductory pricing. As there is a strong need for further exploratory research as well as promotional campaigning, funding must cover research and product innovation, marketing, and product promotion as well as subsidies for introductory pricing.

Innovative technical and credit risk mitigation. In energy lending, the spectrum of risks involved is much broader because it includes not only credit risk but also risk due to failure of technology, change, access to better technology, or absence of service infrastructure, etc. These risks can best be managed by joint collaboration of energy and micro-finance stakeholders where they take advantage of each other's expertise. The key is to ensure that these risks do not pose a barrier to poor consumers. Thus, financing energy solutions calls for innovative risk mitigation strategies, such

as pre-defining deliverables in an MOU on quality standards, detailing warranties, educating clients, building market infrastructure, offering post-sale service, etc. Insurance for the energy product and credit guarantees may be other options for risk mitigation.

Balancing triple bottom lines. A balance needs to be created among the commercial, social, and environmental interests of the MFI (and energy supplier) so that it may tap into the full potential of the emerging growth of energy lending.

CHAPTER 1 • INTRODUCTION

1.1 BACKGROUND

Approximately 2 billion people, or about one-third of humanity, lack access to modern energy services, and some 1.1 billion people in the developing world live on less than US\$ 1 per day.¹ Access to modern fuels and electricity helps increase incomes by improving productivity, creating employment, and providing access to markets. Contrary to popular belief, expenditures by poor energy consumers on inefficient and low quality energy sources are surprisingly high. Most estimates suggest that families in rural areas of developing countries spend a large portion of their income on poor quality and unreliable energy services. For example, among the rural poor with incomes of \$10–\$20 per month, expenditures on inefficient energy can represent 20–25 percent of household incomes—which underscores the ability of energy consumers, even if poor, to pay for modern energy services.²

The microfinance movement in Asia has influenced the growth of the sector globally. In the 1990s, microcredit was viewed by many as a niche market. It is now well accepted that commercial financial institutions can tailor financial services to fit the needs of the poor. Further, there have been emerging trends to piggyback the role of microfinance onto new, commercial-based solutions and services for the poor that will help them to improve their quality of life. The latter includes introducing energy-lending products.

If appropriately designed, loans offered by microfinance institutions (MFIs) can provide clients with access to high quality modern energy services by closely matching loan payments to existing energy expenditures or income flows. Such loans can offset the high upfront cost associated with cleaner technologies, such as biogas, micro hydropower, wind, solar, or liquefied petroleum gas (LPG). To date, an overwhelming majority of financial support for rural energy applications has been publicly funded. Although these programs are beneficial, increased access to loans for consumers will be essential to engage the private sector and improve the investment climate for rural energy services.³ Enhanced understanding of the business opportunities for small-scale lending for energy services, as well as how MFIs can most effectively respond to these opportunities, is essential to facilitate access to appropriate financial services.

The potential for MFIs to offer profitable loans to purchase energy services, and thereby help alleviate poverty, has not yet been realized due to lack of experience by both the energy and microfinance fields and the lack of documented successes. In order to better understand the current experience with energy-lending products in this emerging arena, the United States Agency for International Development (USAID) and the Citi Foundation are funding a comprehensive study on the opportunities, barriers, costs, and impacts associated with MFI lending portfolios that have integrated energy lending into their products. This study, *Using Microfinance to Expand Access to Energy Services—The Emerging Experiences in Asia of the Self-Employed Women’s Association Bank (SEWA), Sarvodaya Economic Enterprise Development Services (SEEDS), Nirdhan Utthan Bank Limited (NUBL), and AMRET*, expects to learn from the detailed profiles of the business models, the clients, and the operation of four existing MFIs in Asia that currently have energy-lending programs. A brief summary of the four MFIs highlighted in this paper is given in Box 1.1.

1. Jose Goldemberg and Thomas B. Johannson, *World Energy Assessment: 2004 Update* (New York: United Nations Development Programme, 2004).
2. World LP Gas Association, *LP Gas and Microfinance: A Study into the Applications and Use of Microfinance in LP Gas Access Projects* (Paris: World LP Gas Association, 2004).
3. Global Village Energy Partnership, proceedings of the “Consumer Lending and Microfinance to Expand Access to Energy Services” workshop, Manila, the Philippines, May 2004.

Box 1.1 The Four MFIs Studied in the Asia Region: SEWA Bank, SEEDS, NUBL, and AMRET

Self-Employed Women's Association (SEWA) Bank, India

SEWA introduced energy lending in 2005, issuing small loans for solar home lights, solar lanterns, and solar cookers. In addition, it is beginning to provide loans to purchase improved smokeless cookstoves, biogas plants, and biomass dryers.

Energy partner: Under its URJA Project,* SEWA Bank offers energy lending exclusively through Solar Electricity Light Company, Ltd. (SELCO), a prominent energy supply company in India. SELCO was established in 1995, and has a network of 25 sales and service centers and over 70,000 clients.

Sarvodaya Economic Enterprise Development Services Guarantee Ltd. (SEEDS), Sri Lanka

SEEDS provides lending for clean energy technologies throughout Sri Lanka, including loans to purchase solar home systems (SHS), power grid connections, and village/community micro hydro power. SEEDS currently serves more than 58,000 individuals with loans for the purchase of SHS, over 3,600 individuals with loans for grid connection, and 14 villages and electricity co-operatives for micro hydropower loans.

Energy partner: For its solar lending, SEEDS has memoranda of understanding (MOUs) with 12 solar companies in Sri Lanka under non-exclusive terms, which at present include: Shell Renewable Lanka Ltd., SELCO Solar Lanka Ltd., Alpha Thermal Systems Ltd., Access International Ltd., Alpha Solar Energy Systems (private) Ltd., E.B Creasy and Company Ltd., Energy Work (private) Ltd., High Tech Solar Systems (private) Ltd., HPI (private) Ltd., Soft Logic Solar Company (private) Ltd., and Suryavahini (private) Ltd. This list of energy partners is non-exhaustive, as SEEDS is open to establishing MOUs with other companies that meet SEEDS' standards and requirements. For its grid-connection lending, SEEDS collaborates with Ceylon Electricity Board (CEB), the public electricity utility. For its village hydro scheme loan, SEEDS has not entered yet into any MOUs with project developers because such agreements are directly between developers and electricity co-operative societies (ECS) as owners of village hydro schemes.

Nirdhan Utthan Bank Ltd. (NUBL), Nepal

NUBL offers a loan product line for the construction of biogas digesters. NBUL has distributed this loan to 65 borrowers and has plans to expand its energy program to include loans for solar photovoltaic devices.

Energy partner: NUBL thus far has not entered into any special agreement or working arrangement with any particular biogas companies. The arrangement is rather on a case-by-case basis.

AMRET, Cambodia

AMRET provides loans for energy services, mainly for investing in electricity and purchasing battery chargers, through its business loan product. As of May 2006, 2% of AMRET's total loan portfolio was currently distributed to such energy uses. AMRET plans to provide loans to those clients (about 7% of its total clients) who have a high consumption of energy for production.

Energy partner: This information was not available at the time of the study because AMRET does not have a special energy-lending program. The loans currently offered to energy clients were via its general business loans.

* "Urja" in Hindi means "energy."

1.2 METHODOLOGY

The research in the Asia region was carried out by two experts representing the energy and microfinance sectors. The task for the Asia Research Consultant was to profile four existing MFI energy-lending programs in Asia, gathering in-

depth information on each MFI's lending program, how it fit within each organization's overall lending portfolio, and how the MFI engaged its customers and energy enterprises in order to provide products and services to customers.

The research carried out in Asia covers four MFIs in four countries, namely, India, Sri Lanka, Nepal, and Cambodia. These countries not only have enormous growth in their microfinance sectors, but also lead the trend of integrating energy lending to financial services. The MFIs studied for this action research include SEWA Bank (India), SEEDS (Sri Lanka), NUBL (Nepal), and AMRET (Cambodia). They were selected to represent the wide array of MFIs offering credit to energy consumers. Each MFI also exhibits a different approach in dealing with energy partners, ranging from an exclusive scheme as demonstrated by SEWA Bank, to very well-defined arrangements through MOUs that impose quality product and service standards on its energy partners by SEEDS, to government standard-setting for biogas units to a non-specific approach by AMRET. The research encompassed a desk review; field research; documentation; and analysis of business models, clients, and operations of the four MFIs.

1.2.1 MFI Selection Process

MFIs who wished to participate in the action research project, *Using Microfinance to Expand Access to Energy Services*, were asked to submit an expression of interest along with details of their institutional profile, institutional performance, energy products, and documents of commitment by management and board of directors to participate in this action research. Based on the expressions of interest received (nine from Asia, six from Africa),⁴ the Small Enterprise Education and Promotion (SEEP) Network and Sustainable Energy Solutions (SES) selected six MFIs for the research project. Pre-requisites for MFI selection were:

1. Legally registered MFI;
2. Established financial sustainability or a clear commitment to and progress toward achieving financial sustainability (typically demonstrated by >75 percent operational sustainability and a business plan demonstrating how financial sustainability will be achieved);
3. Three or more years of operations; and
4. Existing loan product(s) to meet clients' energy-related needs (for households and/or businesses).

The MFIs were paid an honorarium to partially defray any costs related to their participation, and in turn helped coordinate the Asia Research Consultant team's visit. More importantly, the MFIs received in-kind benefits from the extensive input by local and international experts on their energy loan product(s), exposure to new ideas and innovations, lateral learning and information sharing with other MFI participants in the research, and opportunities for greater international recognition and presence through the publication of this report, plus the dissemination activities of SEEP and the advisory group.

1.2.2 Work Plan Summary

The research was designed to explore the opportunities, barriers, costs, and impacts associated with MFIs that have integrated energy lending into their portfolio of products. A framework of questions⁵ was developed by SEEP and SES to guide the team's field research.

Based on information from each MFI about its operation, outreach, and energy stakeholders, **site visits of 5–6 working days** were planned. Guided by the MFI, primary data was collected through direct interviews with key staff, clients, loan officers, and equipment suppliers.

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4. Action research on the energy environment in Latin America and energy lending by MFIs is underway. To date, the desk study is finished and will be published with this report.
 5. See Appendix 1, "Framework Questions Developed for the Field Research."

The Asia Research Consultant synthesized the research results and developed and finalized the report. The draft of the final report was distributed to an advisory board, SES, SEEP, and the other MFIs participating in the study (NUBL, SEWA, SEEDS, and AMRET in Asia, and Faulu Kenya and KUSCCO in Africa) and their respective energy service suppliers to get feedback prior to finalizing the report.

1.2.3 Field Visit

Before the field visit,⁶ a desk review was done to understand the socio-economic situation; banking/financial, microfinance and energy sectors; regulations governing the microfinance and energy sectors; and key microfinance and energy players in the country. It also examined the institutional profile of each MFI, its energy service companies, and any initiatives undertaken in energy lending.

The field visits included meetings with the three stakeholders: MFI (bank management, loan officers), clients, and energy service companies. India was an exception because the team only met with the sole energy service company partnering with SEWA, and not with other energy sector stakeholders. Also, again except in India, meetings were held with government officials and ministries, donor institutions and development agencies, finance institutions, vendor associations, and NGOs to better appreciate the specific contexts of the energy and financial sectors that underlay energy-lending programs. Other MFIs, not part of this study, were also visited to appraise their experiences with energy lending and whether they might introduce energy loan products in the future. (For details of the actual respondents met by the Asia Research Consultant, see Appendix 2.)

The clients interviewed were selected by the MFI, although the team ensured that clients lived in at least two geographical areas (except in Cambodia) and represented the full range of energy products offered by the MFI. However, in the case of SEEDS (Sri Lanka), the team was not able to visit any clients with micro hydro loans, although they met as many clients as possible during the two days designated for client interviews.

Due to the limited amount of readily-available information and short time in the field, the data on client characteristics and energy demands was mainly based on country statistics (secondary data) and limited direct interviews with clients. This was not sufficient to generate accurate statistical data or direct analysis of MFI clients with energy loans. Further, obtaining data needed for impact analysis was also a challenge. With the exception of SEEDS, the participating MFIs had not made any impact studies of their energy lending. Because NUBL had a specific biogas loan and AMRET's energy lending was treated as a business loan, their impact studies did not relate to energy loans specifically. SEWA Bank has commissioned the SEWA Institute to carry out an impact study of its energy lending, but date of its availability is not known.

1.3 DATA ANALYSIS

1.3.1 MFIs

Data was collected on each MFI's outreach (number of groups, clients, and branches), portfolio (disbursement, outstanding, recoveries, etc.), and sources of funds (loan, grants, and equity). For SEEDS, the balance sheet for energy portfolio was constructed from the income and expense statements, plus closing sub-ledger balances. This data was used to analyze the portfolio quality, size of the energy portfolio, vis-à-vis the overall microfinance program of the MFI, and to conduct a profitability analysis in the case of SEEDS. A profitability analysis for the other MFIs was not possible because their programs were too new and small. Data primarily came from the accounts and MIS department at the head office of the respective MFIs and through discussions.

6. See the detailed elaboration of field visit methodology in Appendix 2.

Box 1.2 Typical Data Collected During Field Research

Microfinance Institutions

1. Organizational information (ownership, governance and strategy, products offered, microfinance policies, management systems, funding sources).
2. Financial statements necessary for carrying out financial performance assessment
3. Impact study (past research by MFI, if any, and system adopted to identify impacts)
4. Details of collaborations with energy suppliers; terms and conditions of contract(s); experience working with energy suppliers, other energy suppliers, and energy products available in the market
5. Genesis of the energy loans and rationale on how product designs were determined
6. Specifics of energy loan product(s), such as target group, energy client profile, lending methodology, product design, technology, energy delivery model, end uses of energy loans, portfolio tracking, funding sources, risk mitigation strategy, external collaborations, trainings, marketing strategy, etc.

Clients

1. Direct and indirect impacts on households, individual livelihoods, and quality of life
2. Pattern of energy product usage in past and present
3. Past, current, and future energy needs of the clients
4. Client cash flows, willingness to pay for energy services, knowledge and understanding of energy technology/products, training provided to operate energy technology, benefit derived from energy products
5. Problems faced by clients in managing energy loans (if any)
6. Details of interactions between clients and energy suppliers
7. Client's access to information on energy products

Energy suppliers

1. Details of contract with MFI, direct sales, after-sale service to clients, details of interactions with MFI and client
2. Details of the delivery model adopted to service clients
3. Rationale for technology selected for MFI energy lending products
4. Market infrastructure made available to clients
5. Marketing and outreaching strategy
6. Constraints and opportunities in working with MFIs

Others (conditional)

1. Sector facilitator: Details of type, level, and mechanism of interventions (technical assistance or financial incentives) provided by the sector facilitator that influence current and/or future energy lending program of participating MFIs
2. Other MFIs: Model and loan characteristics of energy loans offered by other finance institutions to understand the general level of competition in the microfinance sector
3. Local market surveys: Energy products offered in the market and general level of competition locally in energy sectors

Because SEEDS does not prepare a separate balance sheet for its energy program, the Asia Research Consultant collected figures for cash-in-hand, cash at bank, gross outstanding portfolio, loan loss reserve (LLR), and outstanding debt from its ledgers to construct a balance sheet. The adjustments made while constructing the balance sheet included appropriation of fixed assets as it does not account for energy lending, LLR, and depreciation separately.⁷

Data on client profiles, baseline energy expenditure, capital cost of alternative energy (such as solar systems), loan amount, loan installments, current energy expenditure, and tangible and intangible benefits from using alternative energy was also gathered. This information was used to analyze the cost savings or increase in income from using better energy solutions and to understand other intangible benefits that the clients may have received. Data primarily came from visits to individual client households, except in case of NUBL where the Asia Research Consultant held discussions with groups of clients.

1.3.2 Energy and Microfinance Stakeholders

Secondary data, from annual reports and other publications, was gathered to understand MFI operations and programs. Research publications on the potential of energy sources and energy markets were also reviewed. Primary data was collected during visits to the respective stakeholders.

Some of the biggest challenges in finding and collecting data was achieving a consistent level of information in every target country and MFI and ensuring data accuracy. There were cases where information provided by different stakeholders on similar subjects was different. With AMRET, much of the required information was already well documented and data collection went quickly. However, translation of the local Cambodian language(s) proved to be a significant barrier to obtaining accurate data from the clients and battery shops. Due to intense competition among battery shops, the vendors were not willing to share accurate information on battery prices, so only approximate data on prices could be obtained.

7. Fixed assets were apportioned based on the estimates provided by SEEDS, taking into account the energy portfolio as a percentage of the total microfinance portfolio. LLR has been increased from 3.8% to 12.6%, due to weak portfolio quality. The recoveries that SEEDS will potentially be able to make from removing solar home systems in case of default have been taken into account when creating the LLR. The income and expenditure statements were adjusted for depreciation based on the apportionment of fixed assets in the balance sheet. However, based on the figures provided by the MFI, the balance sheet drafted by the Asia Research Consultant did not balance. SEEDS could not identify the reason for the difference and concurred that all the other figures presented in the draft statements sent to them were correct. Consequently, the Asia Research Consultant reflected the difference (LKR 87 million [US\$ 836,618]), representing 6 percent of total assets) as current assets on the balance sheet.

CHAPTER 2 • SEWA BANK—INDIA

2.1 INDIA COUNTRY CONTEXT

2.1.1 Socio-economic Environment

India is the world's second most populous country (1,129,866,000, estimated July 2007) and the seventh largest country in area. Based on the UNDP 2002 Human Development Index, India ranked 127 of 177 in the world. In India's diverse economy, services are the major source of economic growth, accounting for half of India's output with less than one-quarter of its labor force. Income distribution is strongly skewed, with the top 10 percent accounting for 33.5 percent of total household income/consumption, and the lowest 10 percent for 3.5 percent.

Its economy has posted an average growth rate of more than 7 percent since 1994, with poverty reduced by about 10 percentage points. India achieved 7.6 percent growth in gross domestic product (GDP) in 2005. Despite its strong growth, the World Bank and others have reservations about India's fiscal deficit (a combined state and federal budget deficit), which has accumulated to approximately 9 percent of GDP. The huge and growing population (population growth rate was 1.34 percent in 2006) is the fundamental social, economic, and environmental problem. As a result—despite improvements—29 percent of the population was still living below the poverty line in 2005.⁸

2.1.2 Banking Sector Overview

For the past three decades, India's banking system has several outstanding achievements to its credit. The most striking is its extensive outreach. Banking has become easy for the urban population. In addition—in theory—there are also 140,000 financial outlets in the rural sector, which implies that there is one outlet for every 5,600 persons—a seemingly excellent banking infrastructure. However, the reality is that the rural poor still lack access to formal finance.

The entire network of primary co-operatives⁹ in the country and the regional rural banks (RRBs)—which were established to provide rural finance—has proved a colossal failure due to the prevailing sociopolitical architecture. The resultant vacuum was filled by various NGOs providing microfinance services. Financial institutions, such as the National Bank for Agricultural and Rural Development (NABARD), Small Industries Development Bank of India (SIDBI), and microfinance promotion organizations, such as the Rashtriya Mahila Kosh, provide bulk loans to NGOs and MFIs. This has resulted in MFIs becoming intermediaries between the largely public development finance institutions and rural and semi-urban retail borrowers. In another model, NABARD refinances commercial bank loans to self-help groups (SHGs) to facilitate relationships between the banks and poor borrowers.

8. World Bank, "India Country Overview 2006," (Washington, DC: World Bank, 2006),

9. Co-operatives and credit unions consist of primary urban co-operative banks, state and central co-operative banks, state and primary co-operative agriculture rural development banks, primary agriculture credit societies, mutually aided co-operative societies, and self-help groups.

2.1.3 Financial Service Suppliers

In India, banks are classified into different groups. At present, there are 20 public sector banks, 20 private sector banks, and 12 foreign banks in India. Each group has its own benefits and limitations to operating in India, as well as its own dedicated target market.

While informal financial services have always been integral to the traditional economy of India, even semi-formal and formal financial services through agricultural co-operatives and banks are within physical reach (less than 5 km) of perhaps 99 percent of the population of the country. A vast network of commercial banks, co-operative banks, and RRBs, as well as other financial institutions, provide such services. Other financial institutions include non-bank finance companies (NBFCs), insurance companies, provident funds, and mutual funds. There are more than 158,000 retail credit outlets in the co-operative and banking sectors, augmented by approximately 13,700 NBFCs. There are also a growing number of foreign banks operating in India, but their reach, through some 200 branches, is limited to the main cities. In addition, non-profit institutions, registered as trusts, societies, or Section 25 companies,¹⁰ provide microfinance services to the rural poor. An additional 300–400 MFIs operate as co-operatives under the conventional state-level co-operative acts, the national-level multi-state co-operative legislation, or the new mutually aided co-operative act (MACS Act).

2.1.4 Regulation of Financial and Microfinance Sectors

The Reserve Bank has been focusing its regulatory and supervisory framework and initiatives on promoting a stable and efficient financial sector, specifically to bring prudential regulation and financial infrastructure in line with international best practices, ensure greater transparency, strengthen the capital base of banks, and build the appropriate financial architecture for risk management. While aiming for a globally competitive and robust banking sector, the Reserve Bank has also emphasized financial inclusion, where banking services are easily accessible by the underprivileged sections of Indian society.

In order to help farmers obtain credit at a reasonable rate, the 2006–2007 Union Budget proposed offering short-term credit to farmers (up to INR 300,000 [US\$ 6,622]) at an interest rate of 7 percent per annum, and the government agreed to provide budgetary resources to co-operative banks as appropriate. A target of 40 percent of net bank credit was stipulated for lending to the priority sector by domestically scheduled commercial banks, in both public and private sectors. Within this, sub-targets of 18 percent and 10 percent of net bank credit, respectively, have been stipulated for lending to agriculture and weaker sections, respectively. A target of 32 percent of net bank credit has been stipulated for lending to the priority sector by foreign banks.

India's regulation of its finance sector includes regulations for banks, non-bank financial companies, co-operatives and credit unions, and non-governmental organizations. Appendix 5 compares the regulations applied to these four different finance institutions, especially participation in financial sector, legal bases for regulating, regulator involved, as well as capital and reserves.

2.1.5 Energy Scenario Overview

India's energy scenario is complex due to the size and the diversity of the country. More than 80 percent of its 1.1 billion population is rural, and the challenge is to reach these people with modern energy services.

10. A section 25 company is a company with limited liability that may be formed for 'promoting commerce, art, science, religion, charity, or any other useful object,' provided that no profits (if any) or other income derived by promoting the company's objects may be distributed in any form to its members." United States International Grantmaking (USIG), Council on Foundations, "Country Information: India," website, <http://www.usig.org/countryinfo/india.asp>.

India's per capita energy consumption is one of the lowest among developing countries. It consumes only 0.31 tons of oil equivalent (TOE) compared to the world average of 1.68 TOE; the average per capita energy consumption for developing countries is 0.74 TOE.¹¹ India's *energy intensity*¹² is 3.7 times Japan's, 1.55 times the United States', 1.47 times Asia's, and 1.5 times the world average.

Although, officially 86 percent of the villages in India are supposed to be electrified, most households that are not in the center of a village do not have access to the grid. Even in urban areas, poor households may have difficulty connecting because the upfront connection cost is unaffordable. In 2001, 76 percent of urban-area households were connected, and 75 percent of rural households. The increase in access to electrification among the poor reflects the negative growth from 2000 to 2002.

India's energy prices have been controlled by the government and subsidies provided to meet certain socio-economic needs of the public, leading to distortion and inefficient use of different energy sources. Recently, the Indian government has taken serious steps to deregulate the energy price. In the electricity sector, most of the State Electricity Boards have initiated reforms and regulatory commissions have been set up to determine tariffs based on economic rationale. Electricity tariffs in India are structured in a relatively simple manner: high-tension consumers are charged for both demand (kilovolt ampere—VA) and energy (kilo watt hour—kWh), and low-tension consumers pay only for energy consumed (kWh), per the tariff system in most electricity boards. The price per kilowatt hour varies significantly across the states as well as across customer segments within the states.

India has a significant renewable energy potential, estimated at more than 100,000 megawatts (MW). In 2001 the contribution of renewable energy reached 3000 MW, or about 3 percent of total grid capacity. However, the overall impact of the renewable energy programs is still limited compared to the magnitude of the energy problems still faced by Indian villages.

2.1.6 Renewable Energy Facilitators and Promoters

India has favorable fiscal and policy conditions for developing renewable energy sources economically. In the last 10 years, renewable energy technologies in India have been promoted through research and development and demonstration programs supported by government subsidies.

In 1987 the government of India incorporated the Indian Renewable Energy Development Agency Limited (IREDA) to facilitate a wide spectrum of financing to introduce renewable energy, energy conservation, and energy efficiency. The various instruments employed by IREDA are debt financing with soft term loans, equipment financing, lease financing, and on-lending through financial intermediaries. Brief overview of fiscal incentives and IREDA's financing norms are presented in Tables 2.1 and 2.2.

Table 2.1 Applicable Fiscal Incentives and Facilities Available to Manufacturers and Users of Renewable Energy

BY THE CENTRAL GOVERNMENT	BY STATE GOVERNMENTS
Income tax holiday	Energy buy-back, power wheeling, and banking facilities
Accelerated depreciation	Sales tax concession and benefits
Concessional custom duty and duty-free import	Electricity tax exemption
Capital and interest subsidies	Demand cut concession for industrial consumers who establish renewable based power-generating units
Price subsidy	Capital subsidy

11. V. Raghuraman and Sajal Ghosh, "Indo-US Cooperation in Energy—Indian Perspective," (Gurgaon, India: Confederation of Indian Industry, 2003).

12. The energy intensity is energy consumption per unit of GDP of which it indicates the development stage of the country.

Table 2.2 Highlights of IREDA's Financing Norms

Debt instruments	- Project financing schemes - Equipment financing schemes - Manufacturing loans
Quantum of assistance	- Up to 80% of project cost - Up to 90% of equipment cost
Rate of interest	0.0–15.0% per annum (at present 2.4–14%)
Moratorium	Up to 3 years (maximum)
Repayment period	Up to 10 years (maximum)

IREDA's lending is mainly in six areas: (1) solar energy technologies—manufacture and utilization of solar thermal and solar photovoltaic systems; (2) wind energy—setting up grid-connected wind farm projects; (3) hydro—setting up small, mini, and micro hydro projects; (4) bio-energy technologies—support for biomass-based co-generation and power generation projects, biomass gasification, and energy from waste and briquette projects; (5) hybrid systems; and (6) energy efficiency and conservation.

In April 2003, the United Nations Environment Programme (UNEP)¹³ initiated a credit facility in southern India, with the support of the United Nations Foundation (UNF) and the Shell Foundation, to help rural households finance the purchase of solar home systems (SHS). Financial support from UNEP consisted of interest rate subsidies for borrowers, assistance with technical issues, marketing support, vendor qualification, and other activities to develop the institutional capacity for this type of finance. The interest subsidy was preferred by the banks over guarantees or other support mechanisms, although they would not benefit directly, because it enabled them to offer preferential banking terms to their customers efficiently and transparently.

As of January 2005, UNEP had financed nearly 12,000 loans through more than 2,000 participating bank branches. The fastest growth in loans is currently in rural areas, which in part attracted increasing participation of the nine Gramen banks. This program is playing a significant role in increasing the loans made available to solar energy consumers.

2.1.7 Energy Suppliers and Service Companies

The number of energy equipment suppliers and service companies in India has been growing rapidly in certain regions (e.g., Karnataka State), especially for individual and small-scale energy solutions, such as photovoltaic, biogas, etc. However, most of these companies (BHEL, BEL, Tata, etc.) are concentrating on either the government market (home lighting, public lighting, traffic lights) or the donor-driven market (mostly solar). During the research for this report, only two companies were identified that concentrated on building market-based retail sales, namely SELCO and Shell Solar. Furthermore, sufficient rural infrastructure (sales and service networks) thus far has been developed only in Karnataka State. Collaborations between SEWA Bank and SELCO are expected to develop a similar energy loan-sales-service venture in Gujarat State, driven by their clients' needs and capitalizing on SELCO's experience delivering energy options in Karnataka.

2.2 ORGANIZATIONAL PROFILE OF SEWA BANK

2.2.1 Structure and Operation

SEWA Bank's primary objective is to provide working capital and savings facilities for poor self-employed working women in Ahmedabad, Gujarat. Its mission is "to reach the maximum number of poor women workers engaged in

13. UNEP Indian Solar Home Programme Overview and Performance Report, March 2005.

the unorganized sector and provide them with suitable financial services for their socio-economic empowerment and self development, through their own management and ownership.”¹⁴

SEWA Bank, registered as an urban co-operative bank, operates both in urban and rural areas. As of 31 March 2006, it had a total of 291,535 active savings accounts and 44,909 shareholders. Eighty percent of the SEWA Bank’s clientele is based in urban areas and the rest in rural areas. At the time of the field research visit, the bank had branches in 11 of Gujarat’s 13 districts. SEWA Bank operates under the direct regulation of Reserve Bank of India (RBI—India’s Central Bank) and has the permission to operate only in the city of Ahmedabad. In rural areas, the bank functions through its registered district associations (a federation of unregistered savings and credit groups, registered under the Mumbai Societies Act).

Accounting and management information system (MIS): At the time of the field research visit, new Windows-based software was being installed. This software has integrated modules for accounts, MIS, and customer profiles and has a better capacity to handle accounts than the previous software. MFI accounting policies are governed by RBI norms and can generate a portfolio-quality analysis report on a daily basis.

Portfolio management: A repayment tracking mechanism is operational at all levels except for collection agents. Although SEWA Bank offers loans for 35 months with monthly repayments, it also allows clients the flexibility of repaying loans in variable installments within the loan term. However, since overdue payments are calculated against monthly dues (RBI norm), this reflects a weak portfolio quality. Should a client not repay a loan within its term, it can be rescheduled at the request of the collection agent. Overall, SEWA Bank’s repayment collection mechanism seemed lax. However, the energy portfolio, being new and small, had a 100 percent repayment rate.

Business planning and financial management: SEWA Bank has a structured mechanism for monitoring its investments and compliance with liquidity norms. There is an investment committee (chairperson, the managing director, general manager, chartered accountant, and two client-members from the board), and the bank also seeks counsel from an investment company. SEWA Bank has cash-in-hand insurance of INR 40 million (US\$ 883,000) and cash-in-transit insurance of INR 10 million (US\$ 220,750) from the New India Insurance Company. Its credit-deposit ratio was low, around 35 percent as of 31 March 2006, indicating a lower deployment of funds in portfolio. This is a result of SEWA Bank’s conservative approach to disbursing loans.

Internal audit: SEWA Bank has an internal audit department with four staff members. Its extension counters are audited on a monthly basis. An audit includes physical verification of cash and verification of loan and saving documents. This audit report is submitted to the head office and the respective extension counter. However, the audit report is brief and does not include observations, details about cause of events, or recommendations. The field-level audit is also limited.

Product development: SEWA Bank has a pronounced service orientation and thus has designed various loan and savings products around the life cycle needs of its clients. These products are driven by client need and demand and include school loans and other services aimed at supporting and preparing the client to meet various social and economic needs at different stages in the life cycle.

2.2.2 Funding Sources

SEWA Bank began with the contribution of share capital from 4,000 women. The members contribute 5 percent of the loan amount for secured loans and 2.5 percent of the loan amount for unsecured loans as share capital. Dividends

14. SEWA Bank, <http://www.sewabank.org/mission.htm>. Its potential clients are variously identified as “hawkers, vendors, and small business women selling vegetable, fruit, fish, eggs and other food items, household goods and clothes; home-based workers like weavers, potters, bidi and agarbatti workers, papad rollers, ready-made garment workers, women who process agricultural products, and artisans; manual laborers and service providers like agricultural laborers, construction workers, contract laborers, handcart pullers, head-loaders, domestic workers, and laundry workers.”

(15 percent) are paid into shareholders' accounts annually. As of 31 March 2006, SEWA Bank had a total share capital of INR 25,783,000 (US\$ 569,161).

Total saving deposits as of 31 March 2006 were INR 665.7 million (US\$ 14,695,364). In addition to this, the bank has borrowed US\$ 680,000 from the Housing and Urban Development Company Limited in 1998, and \$630,000 from HDFC Bank Limited in 1999 for long-term housing finance.

Since SEWA Bank is not registered under the Foreign Contribution Registration Act, grant funds for its energy program of US\$ 150,000 from the Lemelson Foundation and \$20,000 from the United Nations Office for Project Services (UNOPS) were routed through the Mahila Housing Trust, an associate organization of SEWA Bank. The grant from Lemelson Foundation in December 2005 was for loan funds to energy entrepreneurs and end users, along with capacity building support. The grant support from UNOPS was used before starting the energy program to assess the potential of energy needs.

2.3 ENERGY LOAN PORTFOLIO OF SEWA BANK

2.3.1 Model and Methodology

SEWA Bank offers energy loans for SHS and battery chargers to its clients. It offers other energy saving products, such as the sarai cooker and improved cookstoves, with SELCO, but these do not require credit due to their low cost and are paid for in cash by the customer. SEWA provides these energy services to its existing client base in Ahmedabad and follows an individual banking model. The main differences between the non-energy and energy loan products of SEWA Bank are presented in Table 2.3.

A key feature of SEWA's loan provision is its flexible repayment mechanism within the term of loan. There is also an interest subsidy of 7 percent offered on the energy loans (refunded on the timely completion of loan), but it is dependent on grant support from the Lemelson Foundation.

The specifically-designed features of energy loans include a compulsory 15-day trial period for solar photovoltaic (during which the bank makes sure that clients are buying the product only if they feel they need it), advice from SELCO staff on the type and capacity of the energy product (a needs assessment to help clients purchase the least costly and best suited option for their needs), user training for maintenance and operation at time of installation, and free after-sale service during the warranty period. Another important difference between the non-energy and energy loans is that the energy loan payment is made directly to SELCO, and the client is directly given the equipment. The loan appraisal and disbursement mechanism of energy loans are presented in Figure 2.1.

2.3.2 Relationship of SEWA Bank, SELCO, and Clients

One of the unique characteristics of SEWA Bank's energy program is the strong partnership with SELCO to provide energy services to their clients. SELCO is a prominent comprehensive energy company in India that provides products, service, and consumer financing for unserved populations.

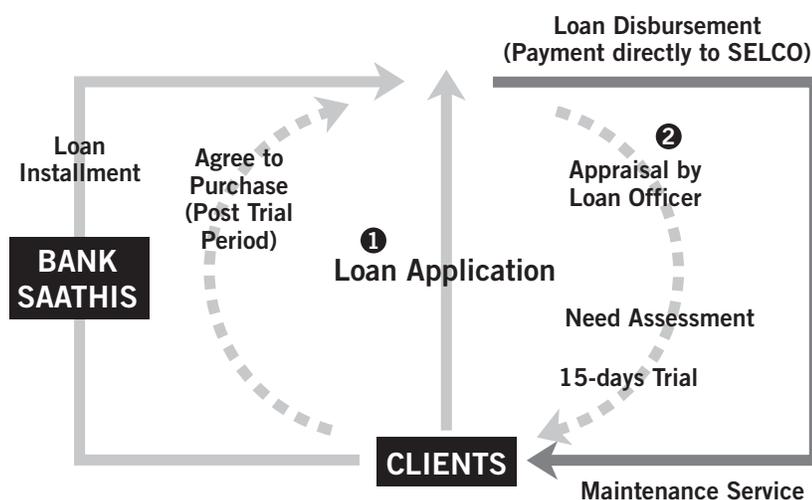
The similarity in mission, target clients, and organizational values form the foundation of their partnership, and clearly defined roles and responsibilities under different possible circumstances are crucial. Both SELCO and SEWA Bank aim to provide one-stop energy solutions to clients under this joint initiative—the URJA Project—by identifying the energy needs of its clients and developing and introducing new products with the potential to reduce drudgery and improve productivity.

Under the project, both SEWA Bank and SELCO rely on each other's experience and expertise to provide energy services to the clients. While SEWA Bank provides financial services and use of its existing infrastructure to market

Table 2.3 Differences Between SEWA Bank's Non-Energy and Energy Loans

	NON-ENERGY LOAN	ENERGY LOAN
Model	- Urban areas: Individual - Rural areas: Group	Individual, offered only in Ahmedabad city
Interest rate	17% declining p.a.	17% declining p.a., but 7% is refunded upon completion of loan on time
Loan period	35 months	35 months
Installments	Flexible within loan term	Flexible within loan term
Loan size (in INR)	- Unsecured loans: Maximum INR 50,000 (US\$ 1,103) - Secured loans: 100% of the value of security	- Unsecured loans: Maximum INR 50,000 (US\$ 1,103) - Secured loans: 100% of the value of security
Loan criteria	Saving with the bank for at least 6 months	Has to open savings account with SEWA Bank
Loan appraisal	Done by banksaathis, loan officers	- Energy need pre-assessed by vendor and staff - Loan appraisal by banksaathis - 15-day product trial before loan sanction
Loan approval	- Bank/branch manager: Loans up to INR 50,000 (US\$ 1,103) - Head office: Loans > INR 50,000 (US\$ 1,103)	Centralized at head office
Loan processing time	1–2 days	1 day
Disbursement	Through extension counter	Head office, but will be decentralized in future
Cash transfer	Clients paid in cash	Disbursement to SELCO, client receives equipment
Post-disbursement services		Free maintenance and operation during the warranty
Loan collection	Collected by banksaathis or directly deposited at branch/head office	Collected by banksaathis
Other unique features	Financial and business counseling training sessions	Dedicated training: 1-hour session during financial and business counseling, special energy training by vendor and user training at the time of installation

Figure 2.1 Process of a SEWA Bank Energy Loan



the energy products, SELCO gives advisory support to the clients on energy products, installs the products, provides after-sale service, offers a buy-back option to clients, and trains clients and staff of SEWA Bank on the energy products. SELCO benefits from SEWA Bank's huge client base of 290,000 and existing infrastructure, which reduces its transaction costs. On the other hand, SEWA Bank can meet its clients' energy needs through customized energy products without bearing any technical risk. Moreover, SELCO has a well-developed, decentralized service infrastructure and provides prompt after-sale service. Through its robust international relations, SELCO has also brought its network of energy technologies and funding resources to the URJA Project. The Lemelson Foundation's support of the URJA Project was one benefit of SELCO's network capital.

SELCO has opened an office in Ahmedabad with three staff members who frequently visit SEWA Bank and any clients requiring assistance. SEWA Bank makes the loan appraisal and markets the energy products. An amount equivalent to the value of energy product is paid directly by SEWA Bank to SELCO after the installation. Clients repay energy loans to the SEWA Bank through banksaathis.

SEWA Bank markets energy products through its existing promotional channels, which include:

- Amrud Jarnu van, a mobile van used to promote SEWA Bank's products;
- Business and financial counseling services offered routinely to enhance financial management skills of members;
- Banksaathis, who are encouraged to purchase energy products as demonstration units;
- Brochures and pamphlets on energy products;
- Marketing at monthly fairs ("mela") with stalls set up to demonstrate energy products; and
- Other SEWA (parent NGO) programs, such as healthcare, education, etc.

2.3.3 Characteristics

Client profile: SEWA Bank serves poor self-employed women in urban and rural areas. Energy clients include energy end-consumers (needing energy solutions for household consumption), hawkers (energy for productive use), as well as energy entrepreneurs (battery-charging services). Unlike other lending products, energy clients do not necessarily need to be existing savings members of SEWA Bank. However, before energy loan disbursement, clients must open a savings account with the bank.

Energy products: The energy-lending program of SEWA Bank offers technologically neutral energy solutions. Through intensive collaboration with its energy partner SELCO, SEWA Bank aims to explore, identify, and introduce energy products and loans, which they believe will help to reduce drudgery, increase income, reduce cost, and improve health conditions of its clients.

Based on the market survey conducted by SEWA Bank before introducing the URJA Project, lighting and cooking were identified as the main areas where intervention was needed to provide access to better energy technology. However, because the clients of SEWA Bank are involved in varied activities, energy needs for lighting may be very different for hawkers than for midwives. For example, midwives need headlamps that allow them to adjust the direction of the light without using their hands. Similarly, client preferences for cooking may differ based on convenience in utilization, time involved, impact on health, and cost. It is important to understand that lighting and cooking extend beyond domestic and household use, and that products need to be customized to serve the different productive activities of the clients.

At the time of this research study, SELCO was in the process of identifying specific needs to be able to develop and offer cheaper and better modern energy solutions to clients. As SEWA and SELCO commit to provide better energy solutions, there is a good chance that they will introduce more energy products in the near future, including biogas, gas cookers, and solar driers.

Table 2.4 Features of Energy Products Offered by the URJA Project

	PHOTOVOLTAIC SYSTEM			ANNAPURNA STOVE	SARAI COOKER
	SHS	Battery Charging	Solar Lanterns		
Salient features	A stand-alone electrical power system that enables households with no access to grid to have electricity	Expands access to photovoltaic system to those who cannot afford to buy it, via rental system	Replaces kerosene as a cleaner and cheaper lighting solution; saves 15–30%	Smokeless and energy efficient cookstove that saves time and reduces fuel consumption by 30%; has positive health impact	Saves time and cost, reduces cooking cost to INR 1/day (US\$ 0.02) for a 4-member family and cooking time to 45 minutes
Capacity	40–180 watt peak (Wp)				8 and 12 liters
Price of the equipment	INR 12,400–94,000 (US\$ 274–2,075)	INR 5,000 (US\$ 110) per battery	INR 5,000 (US\$ 110)	Maximum INR 350 (US\$ 7.72) plus INR 100 for mason's fee (US\$ 2.20)	INR 625 (US\$ 13.80) and INR 825 (US\$ 18.21)
User profile	Household	Enterprises offering battery rental or battery charging to hawkers	Hawkers	Household	Household

Energy uses: To expand the outreach of its energy services, the URJA Project also promotes energy for productive uses and income-generating activities. This includes introducing solar lanterns for hawkers, as well as photovoltaic battery-charging stations for small energy enterprises, which provide battery rentals or battery charging services to street hawkers. This scheme allows the hawkers to substitute a better, cheaper, and cleaner lighting source for kerosene and creates a profitable business opportunity for entrepreneurs. Further, by introducing battery-charging entrepreneurs, the delivery model is diversified to accommodate hawkers of different economic profiles. Hawkets who might not be able to purchase a solar lantern now have the option of renting a battery from the energy entrepreneurs. Since 2006, four energy entrepreneurs have received loans from SEWA Bank to establish their battery-charging and rental business. This has been profitable for these entrepreneurs, one of whom has even taken out a second loan to expand her business. To scale up the energy entrepreneur scheme, SEWA Bank and SELCO conduct special trainings with funding support from the Lemelson Foundation.

Market potential profile: With over 290,000 members, SEWA Bank has a strong client base for its energy program. Every one of its members needs better energy solutions, whether for lighting, cooking, or productive and income-generating activities. Having a technologically neutral, demand-driven, and personalized energy program enables SEWA Bank to capture wider market potential among its existing client base. In addition, SEWA Bank is showing strong promise to further extend its energy program to the 700,000 members of the full SEWA organization. For example, SEWA Bank can collaborate with the Mahila Housing Trust to integrate SHS loans into its housing loans. Integrating SHS loans into other SEWA programs would benefit the energy-lending program by piggybacking on the existing client base.

2.3.4 Administration and Management

Since SEWA Bank is not registered under the Foreign Contribution Registration Act, it cannot receive funds from outside India. SEWA's associate, the Mahila Housing Trust has an account with SEWA Bank, as does SELCO. Loan

Box 2.1 Photovoltaic Battery Charging: A Profitable Business

Capital Expenditure: Approximately INR 5,000 (US\$ 110) per battery unit for each solar light that operates 6–8 hours/day, and INR 3,500 (US\$ 77) for one that operates 3–4 hours/day

Clients: Hawkers (fruit vendors, vegetable vendors etc)

Revenue: The daily rental fee for battery with 6–8 hours running capacity is INR 20–25 (US\$ 0.44–0.55), a savings of INR 10–15 (US\$ 0.22–0.33) over kerosene light.

The annual revenue for renting a 6–8 hours battery is INR 20 x 340 days = INR 6,800 (US\$ 150). Assuming that the loan period is 2 years at an interest rate of 17% p.a. (declining) and the client pays on time, the client will pay INR 5,885. In the first year, the amount paid would be INR 3,155, and then INR 2,730 in the second year. If the expense for transporting the battery to clients is INR 45 per month for petrol, or INR 540 per year, the business owner could see INR 3,105 of revenue in the first year and INR 3,530 in the second year. When the loan is paid off, assuming that the price of petrol and the rental fee remain the same, the client should save INR 6,260 (US\$ 138) per year per unit system.

funds are transferred from Mahila to SELCO's account at the time of loan disbursement. Equipment purchase documents (receipt, warranty card, etc.) are prepared in the name of the client, but they are maintained by SEWA and released to the clients only after the loan is repaid.

SEWA Bank has set up a separate energy division to manage its energy program. Two accountants have also been permanently assigned to energy lending. Nearly 200 staff members of SEWA Bank have been trained by SELCO on energy products. Because the program is very new, it is still being administered and monitored directly from the head office. However, in the future, some of the functions will be decentralized.

2.3.5 Financial Analysis

SEWA Bank's energy lending under the URJA Project only began in April 2006. By August 2006, SEWA Bank had installed 28 SHS units, 66 single solar lanterns, and 630 sarai cookers. The total loan amount disbursed during this period for SHS was INR 328,442 (US\$ 7,471), and for single solar lanterns was INR 313,550 (US\$ 6,921). Average loan size for SHS was INR 11,730 (US\$ 259) and INR 4,750 (US\$ 105) for single solar light. The total energy portfolio as of August 2006 was less than 1 percent of the total loan portfolio of SEWA Bank

With only 94 loans disbursed (total of INR 641,992 [US\$ 14,172]) by the August 2006 field visit, SEWA Bank showed no energy loan defaults and a 100-percent repayment rate. It is premature to state whether the energy lending will reap profits for SEWA Bank, especially since the information on the operation cost was not available. SEWA Bank expects to reach the break-even point and operational efficiency by scaling up its portfolio and reducing transaction costs. It plans to divide its client base into segments based on their economic activity (street hawkers, mid-wives, etc.) and then develop and provide energy solutions for them. SEWA Bank has over 40,000 members working as street hawkers alone.

2.3.6 Impact Analysis

With the creation of energy entrepreneurs, the organization has been able to target hawkers with different economic profiles. In the most productive activities, lack of basic infrastructure facilities poses limitations, such vegetable vendors whose business suffered at night due to inadequate lighting and high cost of kerosene (INR 35–45 per day [US\$ 0.77–0.99]). The introduction of solar light has improved the vendors' business by increasing the number of working hours: better lighting attracts customers and the vendor saves money by renting a solar light (INR 20–25 for 6–8

hours [US\$ 0.44–0.55]). Box 2.1 describes the business profile of the battery-charging business, based on interviews with a client of SEWA Bank.

For other products, such as improved cookstoves and sarai cookers, the benefit includes more efficient use of fuel (e.g., wood), better hygiene, greater comfort, and better health. These stoves vent smoke outside the house, by-products like ash are used to clean utensils, and coal can be used. A sarai cooker saves time because a complete meal can be cooked in just 45 minutes using only 100 grams of charcoal, costing around INR 1 (US\$ 0.02).

2.4 DISCUSSION—SEWA

2.4.1 Highlights and Challenges of SEWA Bank’s Energy-Lending Model

Highlights

- The URJA project does not just provide banking service to the energy clients. Rather, it is a **comprehensive and convenient one-stop service**, providing more efficient energy products and services combined with a credit facility in one location at the doorstep of the clients.
- The URJA project adopts technologically neutral energy solutions and makes an effort to offer **customer-friendly energy loan products**. SEWA Bank and SELCO continue to explore and introduce new energy products and customize existing ones based on their clients’ needs. Furthermore, through a 15-day trial of the energy product, clients are empowered to select the energy solution that is right for them.
- **The strengths of SELCO as the energy partner** of the URJA Project include (1) addressing poverty through energy services; (2) introducing customized energy options; (3) building a strong decentralized sales and service infrastructure; (4) applying a demand-driven, responsive, and sustainable service model; and (5) incorporating a strong international network for accessing various technologies and funding.
- **SEWA Bank’s focus on technical capacity** has produced loan officers who have been trained in energy products, loan characteristics, and loan methodology. The training materials include SEWA Bank’s rationale for offering energy loans as well as impacts to be achieved; specific, different procedures for energy lending; technical knowledge of energy products; and technical capacity for pre-assessing client energy needs.
- One of the strengths of the URJA Project is its special emphasis on advancing energy for productive uses and income-generating activities, including **promoting new energy enterprises** as business opportunities.
- To help reduce start-up and transaction costs, the URJA Project benefits from SEWA Bank’s **existing market infrastructure**, including various marketing channels and events as well as the role of banksaathis who can be optimized as marketing agents for energy products.

Challenges

- The provision of a 7-percent interest return to energy clients who pay regularly upon completion of installment (which acts as a **loan subsidy**) has the potential of distorting the URJA Project. SEWA Bank needs to carefully calculate its loan cost structure as a basis for analyzing whether such an interest rate structure is sustainable, since it is subject to the availability and continuation of the Lemelson Foundation grant.
- Although the flexible mechanism adopted by SEWA Bank provides greater access to financing for their target group, this **loan methodology also creates challenges**, particularly maintaining sound portfolio quality and tracking repayments to avoid fraud or misappropriation.

- SEWA Bank promotes other SELCO products (the sarai cooker and smokeless stove called Annapurna) even if they do not require a credit facility. It was sometimes observed that non-members had been able to purchase the energy products from SELCO via the bank. However, the bank does not charge any commission to SELCO or non-members for this service. SEWA Bank should work out a model, in consultation with SELCO, to *cover all of its market expenses*. In case services are provided to non-members, a commission can be charged to cover associated costs.
- While banksaathis have been effective in promoting and servicing SEWA's energy products, they are not employees of the SEWA Bank but agents commissioned to collect loan repayments. Though a field level checking has begun recently to verify collection data against field data, it is important that *adequate controls for the banksaathis' role and performance* be built in to safeguard against various potential credit risks (human error, fraud, or the death, illness, or resignation of the banksaathis). Without a more disciplined system, SEWA Bank could experience difficulties in sustaining the portfolio quality of energy loans when it scales up its energy lending.
- Unlike in Karnataka, where the market has long been exposed to energy products, alternative energy is relatively new in Gujarat. It will require intensive, extensive, and *expensive market education to promote and develop a new market* there, which the URJA Project may not be able to finance. In addition, SELCO is slowly building its sales and service networks in Gujarat and currently depends significantly on the existing infrastructure of SEWA Bank to reach rural areas. Without sufficient scale of market, it would be too costly for SELCO to set up a sales and service network, but without widespread presence, SELCO will find it difficult to optimize market development for its products and services.
- SEWA's *single energy partner* SELCO is a pillar of the program. However, clients do not have the choice to buy energy products from any other companies. This could become a drawback if SELCO starts to enjoy its monopoly too much. With NUBL and SEEDS, clients have the right to choose the company which serves them best.

2.4.2 Key Lessons Learned

Donor or government support is not always crucial. The SEWA Bank model for energy lending showcases the point that the absence of a donor/government support program (such as the UNEP Solar Loan Program) does not necessarily stifle the creation of a credit market for energy lending. However, such a model can only work if the respective MFIs are strongly committed to investing their resources beyond the microfinance component. Also, having a strong energy partner that shares a similar mission and platform is vital. Nevertheless, in cases where energy lending is completely new to a country, the UNEP-type of support (financial support and technical support) is more effective for maximizing resources and offsetting risks during the program kick-off.

A client database and profiles are necessary. For SEWA Bank and SELCO to develop demand-driven and customized energy products effectively and efficiently, SEWA Bank should establish a database of client profiles, which includes the energy, cash flow, and geographic profiles, as well as other demographic information. This database would be useful not only for the energy program, but also for any other special lending program. It would also increase the visibility of the bank's energy project among funders and donors.

Learn to capitalize on reputation to attract outside funding. SEWA Bank and SELCO need to further mobilize external resources (financial and technical) to leverage the outreach and impact of the URJA Project. They should consider taking advantage of their reputations and use their existing record of accomplishment and credibility to scale up energy lending or other energy programs. Such external support is crucial, especially for introducing new products, improving systems, building market awareness, and building capacity. Some areas of innovation to leverage Urja's outreach and impact are presented in Table 2.5.

Table 2.5 Areas of Innovation to Leverage URJA's Outreach and Impact

Energy product	Exploring other energy solutions for productive use and income-generating activities, such as solar driers and customized photovoltaic systems. The role of SELCO is crucial in providing the technical knowledge and capabilities as is its access to national and international technology sources—which will enrich SEWA with better and more technology selections for its clients.
Lending product	Integrating energy lending with other lending products, such as housing loans and business loans. Interaction with other organizations of SEWA is crucial for exploring new but captive markets for energy products.
Financing product	Collaborating with insurance companies to mitigate potential risks resulting from natural disaster, accidents, etc. Interactions with sector facilitators and players (microfinance and energy sector) nationally and internationally. This offers contact with best practices and lessons learned for designing effective and sound internal energy risk funds.
Marketing approach	Mainstream energy products and lending to conventional distribution and sales network, i.e. kerosene agents, market shops, etc. Collaboration with government, donors, and NGO support programs can be explored to piggyback on their marketing channels.

2.4.3 Opportunities for Country Scale-Up and Regional Replication

Unique energy lending model. The SEWA Bank energy-lending model is unique in the sense that it emphasizes better energy solutions for its clients over the profitability of the product. Such an approach, as demonstrated by the adoption of a flexible financing mechanism and customized products, definitely answers the need of the poor community for better access to more efficient and cheaper energy solutions. However, this model experiments with standard microfinance lending practice, which many business-as-usual MFIs may not find acceptable. Therefore, replication of the SEWA Bank model need to take into account the context that makes the URJA Project workable. Replicating the SEWA Bank energy-lending model will require the availability of a strong energy partner which is willing to invest its resources to jointly develop the energy-lending program and able to undertake tasks and responsibilities that are beyond the core business of an MFI. It also will need a cohort of commission-based credit agents (the SEWA Bank's banksaathis), who can expand energy lending without creating a burden on program overhead. Replication will depend on existing marketing and outreach channels, on which the energy-lending program can piggyback.

Well-planned strategy. The introduction of customized financial service and customized energy products requires a well-conceived energy-lending model. Therefore, without a good strategy on cost structuring, funding, and risk mitigation, the SEWA Bank energy-lending model would be difficult to replicate. However, if such a strategy can be developed well, this energy-lending model (with its strong collaboration between the MFI and energy partner to introduce consumer-friendly energy-lending products) stands as an answer to removing barriers to modern energy among poor communities.

CHAPTER 3 • SEEDS—SRI LANKA

3.1 SRI LANKA COUNTRY CONTEXT

3.1.1 Socio-economic Environment

Approximately 20 million people live in the Democratic Socialist Republic of Sri Lanka, which has an average per capita income of US\$ 1,030 in 2004. Per capita gross domestic product (GDP) is the highest in South Asia (excluding the Maldives). The government of Sri Lanka places a high premium on social development, and the country has made substantial achievements in education, gender equality, and safe water and sanitation facilities. Yet, poverty reduction has been slow, with only a 3-percent reduction between 1991 and 2002. There are also sector growth disparities among industry (26 percent of GDP), agriculture (19 percent of GDP), and services (55 percent of GDP).

Some indicators are positive: economic growth increased and inflation fell from 14.2 percent in 2001 to 6.3 percent in 2003. The most recent figures, however, show a trend of increasing inflation and budget deficits that could hamper macro-economic stability.

3.1.2 Financial Service Suppliers

Sri Lanka's modern financial sector has undergone significant reforms since the early 1990s, mostly to reduce the government's role as a direct provider. A wide range of institutions offer financial services, including public and private banks, specialized financial institutions, MFIs, leasing companies, and insurance companies. The majority of them are not specialized in financial services, but rather combine microfinance with other development or welfare programs. The government of Sri Lanka plays a significant role in delivery of financial services. It provides credit and savings services directly through the Samurdhi banks¹⁵ and Gamiediriya.

Some commercial banks provide financial services to poor people. Of the 22 licensed banks regulated and supervised by Central Bank of Sri Lanka, fewer than six provide services to the low-income and poor populations. There are also 14 licensed specialized banks supervised by the Central Bank, including six regional development banks owned by the government, a public savings bank, other state-owned specialized banks, and various private banks. There are 28 registered finance companies in Sri Lanka (supervised by the Central Bank), of which at least one, Lanka ORIX FINANCE Company Ltd., provides some financial services to the poor and low-income population.

The co-operative sector includes 1,539 co-operative rural bank branches that are associated with multi-purpose co-operative societies, more than 7,400 thrift credit co-operative societies (TCCSs) set up by the SANASA group, and various local co-operatives offering credit and savings services. Institutions that are neither licensed nor regulated by the Central Bank or the Ministry of Co-operatives are generally registered as societies, companies, or NGOs. Of the more than 3,400 unregulated co-operatives, around 250 provide financial services.

15. Elena Glinskaya, "An Empirical Evaluation of the Samurdhi Program," prepared as a background paper for "Sri Lanka Poverty Assessment," Report No 22-535-CE (Washington, DC: World Bank, 2003).

3.1.3 Regulation of Financial and Microfinance Sector

The Central Bank of Sri Lanka supervises the formal banking sector, which includes institutions and organizations offering microfinance services. Besides the Central Bank, various ministries are also involved in supervising microfinance. However the existing regulation and supervision guidelines are not very comprehensive and there are initiatives to introduce regulations for the rural financial institutions.

The Ministry of Finance and Planning tracks donor money through the external resources/foreign aid and budget monitoring departments. Although it does not provide funds itself, it allocates funds to various ministries (co-operatives, Samurrdhi, rural development, agriculture, fisheries, etc.) through the newly created development finance department. The role and regulatory requirements of various financial sector players are presented in Table 3.1.

Table 3.1 Role and Regulatory Requirements of Financial Sector Players* in Sri Lanka

	BANKS	CO-OPERATIVES	NON-PROFIT INSTITUTIONS
Participation in rural financial sector	State-owned banks through government programs target poor and rural entrepreneurs	Engage in mobilizing deposits and invest such deposits in community-based lending programs	Created to eradicate poverty by empowering the poor through mass mobilization
Regulation	Banking Act No. 30 (1988) as amended by the Banking (Amendments) Acts No. 39 (1990) and 33 (1995)	Co-operative Societies Law No. 5 (1972) as amended by Act No. 32 (1983) and Act No. 11 (1992); Co-operative Societies Rules No. 93/5 (1996)	- Companies Act No. 17 (1982) - Voluntary Social Service Organizations Act (1980)
Regulator	Central Bank of Sri Lanka	Co-operative Development Department	
Activities undertaken	Engagement in full range of banking activities, including deposit-taking and payment services	Institutions engage in banking activities with members only.	Many take deposits, even though it is not legally allowed.
Capital and reserves	US\$ 4.82 million (LKR 500 million). Minimum capital adequacy of 10% (minimum tier 1 ratio: 5%)	None	None

* Microfinance activities can be undertaken by any of the financing institutions (e.g., banks, co-operatives, NGOs) in the table.

3.1.4 Energy Scenario Overview

Energy for cooking accounts for 42.5 percent of the total energy use, of which 90 percent is generated from biomass and 10 percent from kerosene and LPG. Energy for lighting is 7 percent of total energy—55 percent from electricity and 45 percent kerosene. Energy for industries accounts for 20.2 percent of total energy—68.8 percent from biomass, 2.7 percent from LPG, and 29 percent from oil. Sri Lanka's energy intensity is 0.68 times Asia's and 0.57 times the world average. Electricity consumption per capita per year in Sri Lanka in 2003 was 325.1 kilowatt hours,¹⁶ which is lower than India or Pakistan.

Approximately 75 percent of the population inhabits rural areas where biomass is the largest energy source (primarily for cooking). Nearly 80 percent of biomass supply is obtained from non-forest resources—agricultural and plantation activities. About 70 percent of the biomass is collected free and 30 percent is purchased (mostly in urban areas). Of the biomass used in the domestic sector, 73 percent is for cooking. Rural and small-scale industries use 27 percent of biomass.

16. World Resources Institute, Earth Trends: The Environmental Information Portal (website), "Electricity: Electrical Consumption per Capita, Sri Lanka, 2003." 574

Of Sri Lanka's population of 20.1 million in 2004, only 65 percent had access to electricity.¹⁷ The rural electrification rate varies from 20 percent of the households in the north to 92 percent in Colombo. The average rural electrification rate in rural areas and estate areas in Sri Lanka are 47 percent and 50 percent, respectively. It has been estimated that over 2 million households are not yet electrified, and electricity demand grows by 10 percent annually.

The low population density and the high transmission costs have made supplying power to remote areas difficult and non-viable. It has been estimated that 20 percent of the households needs to be electrified through off-grid systems. To meet the rural electricity gap, about 60,000 solar photovoltaic systems are sold by the private sector to households with microfinancing. About 5,000 households benefited from 300 off-grid micro (village) hydro projects initially developed by NGOs.

3.1.5 Renewable Energy Implementation in Sri Lanka

The share of renewable energy technologies in total electricity production is about 0.1 percent.¹⁸ Implementation of renewable energy in Sri Lanka has been supported by the Ministry of Power and Energy and developed commercially through the World Bank and the Global Environment Facility (GEF)-funded Energy Services Delivery (ESD) project. The US\$ 55-million ESD project has galvanized the private sector to develop the solar photovoltaic market with microfinance, micro (village) hydro projects, as well as grid-connected micro hydro projects. This project has evolved into the Renewable Energy for Rural Economic Development (RERED) project. Some highlights of Sri Lanka's renewable energy programs are presented in Box 3.1.

Box 3.1 Renewable Energy in Sri Lanka's Program

Biogas plants: Sri Lanka has considerable experience in biogas technology. In 2004 it reported that nearly 3,000 units were in operation, mostly constructed by the private sector. A study of the potential of biogas from biomass sources by Intermediate Technology Group (Sri Lanka) estimates a total power generation potential of 288 MW, which includes 86 MW from livestock waste. A report on biogas potential in Sri Lanka, prepared by Multi-National Collaboration Environment of India, estimates 3,600 million m³ per annum with the possibility of 3 million family-sized biogas plants.

Biomass thermal plants: At present a 35-kW model dendro plant has been commissioned in Sapugaskanda and operated by a private company. A grid-connected dendro power plant of 1 MW is presently in operation at Walapone.

Micro hydro: Over 400 micro hydro sites have been reported in the country. The total capacity of small/mini hydroelectric plants currently connected to the national grid system is around 37 MW. All were developed by private developers. In addition, 28 village mini-grids ranging from 4–45 kW, serving about 1,400 households were established under ESD project. ITDG reported that more than 250 village hydro schemes have been implemented in 8 districts (225 were in operation in 2003), with combined capacity of 2,500 kW, serving 5,150 beneficiaries. Sri Lanka has a suitable environment for harnessing hydro power at large, small, and micro levels. Excluding the presently installed capacity, the identified hydro potentials include 30 MW of small hydro potentials in about 60 underdeveloped sites, 8 MW in about 290 irrigation tanks and reservoir sites, 150 MW of small hydro potentials tapped from 390 sites that can either be rehabilitated or redeveloped, and 18 MW in about 444 technically viable sites in the village hydro category.

Solar photovoltaic system: Solar photovoltaic implementation in Sri Lanka has been commended for systemic achievements made in a short period of time. The Solar Industry Association reported that by the second quarter of 2005 over 100,000 solar photovoltaic systems were sold and installed by private companies.

17. Lalith Gunaratne, "Grid Connected and Decentralized Power Generation Options: How to Level the Playing Field—A Focus on South Asia," paper presented at the "Asian Regional Workshop on Electricity and Development," Asian Institute of Technology (AIT), Pathumthani, Thailand, April 2005.

18. National Engineering Research and Development Center, "SWERA Country Report for Sri Lanka" (SWERA, 2005).

3.1.6 Renewable Energy Facilitators

The government of Sri Lanka, with the assistance of the World Bank and GEF, implemented the Renewable Energy for Rural Economic Development (RERED) project over a five-year period (2002–2007). The project aims to expand the commercial provision and utilization of renewable energy, improve the quality of life and economic development in rural areas by providing access to electricity to 100,000 rural households, and add 85 MW of grid-connected electricity generation capacity.

RERED provides refinance, grant, and technical assistance for two primary development objectives: 1) providing off-grid electricity services to invigorate the rural economy, empower the poor, and improve their standard of living; and 2) setting up grid-connected investment projects to encourage competition in the power sector, provide additional capacity and diversity, and achieve greater sector efficiency and transparency. RERED runs four types of projects: off-grid community projects, off-grid individual solutions, grid connection (commercial loans), and energy efficiency projects. The financing facility for off-grid renewable energy projects is channeled via designated “Participating Credit Institution” (PCI) refinancing schemes, which thus far include 3 development banks, 4 commercial banks, 2 leasing companies, and 1 MFI (SEEDS—Sarvodaya Economic Enterprise Development Services).

The RERED project is financed by a US\$ 75-million line of credit from the International Development Association of the World Bank and an \$8-million grant from GEF. RERED provides medium- to long-term finance to private companies and enterprises, NGOs, co-operatives, or individuals for grid-connected and off-grid, community-based or household-based renewable energy projects. The executing agency of RERED is an administrative unit set up within DFCC Bank in Sri Lanka. Besides the GEF grant through RERED, the government has provided grants of US\$ 100 per system per household since August 2003. (The grants were introduced island-wide in the financial year 2006–2007). The Asian Development Bank is also implementing a pilot project through a grant of US \$1.5 million from its Japan Fund for Poverty Reduction (financed by the government of Japan) to enable poor households in Sri Lanka to directly benefit from rural electrification. A list of other renewable energy promoters in Sri Lanka is also presented below.

RERED, as part of its initiative in off-grid areas, helps establish village hydro schemes. Village hydro schemes are built, owned, and operated by communities themselves through electricity co-operative societies (ECS) that are set up for this purpose. Of the total cost of village hydro, only 30–50 percent is financed through loans. The balance is mobilized as equity contribution through ECS (as cash and in-kind contributions) and grants from various other sources.

Box 3.2 Other Renewable Energy Promoters in Sri Lanka

Energy Conservation Fund: A government organization which has the statutory power to promote renewable energy and provide policy support. It is in the process of formulating a biomass energy policy.

Energy Forum: A local NGO primarily involved in promoting renewable off-grid power generation. Energy Forum sets up networks to promote renewable energy technologies supported by Asia Pro Eco of the European Community.

IDEA: Serves as the national focal point of ARECOP (Asia Regional Cookstove Program) and is a member of INFORSE (an international network for sustainable energy). It supports NGO networking and capacity building to promote use of more efficient wood stoves and upgrading kitchens, including the Anagi stove.

Practical Actions: The regional branch of the international organization previously known as ITDG. They provide support for promoting village hydro schemes (off-grid), grid-connected small hydro power plants, and other decentralized options, such as biogas system and small wind systems.

The National Engineering Research and Development (NERD) Centre: Has developed and adapted several renewable energy technologies to local conditions associated with solar, wind, and biomass.

3.1.7 Energy Suppliers and Industry Players

One of the key factors of renewable energy implementation in Sri Lanka is the availability of suppliers of renewable energy technology with strong sales and service networks, especially for photovoltaic and hydro systems.

Sri Lanka has 14 registered solar companies with more than 180 sales and service outlets in total, employing more than 1,700 people (mostly rural). Of these 14 companies, Shell Solar and Suryavahini are the most popular. The growth of the solar industry in Sri Lanka has also benefited from the price subsidies provided by RERED and local governments. These subsidies are channeled via the companies and passed on to the consumers as price reductions. Per the Solar Industry Association (SIA) of Sri Lanka, in 2005 SIA members achieved aggregate average monthly sales of more than 2,000 systems with a total annual turnover of US\$ 9.7 million. The industry has been supported by six rural credit providers that offer financing for the purchase of photovoltaic SHS, with SEEDS as the leader. At present, 8 of 14 registered solar companies are members of SIA.

For micro hydro projects, independent project preparation consultants known as project developers are crucial to a successful process, especially for village hydro schemes. Project developers provide village communities with technical services, capacity building, and negotiation assistance to set up a village hydro scheme, for which they receive grant support under RERED. To qualify for such grants, the project developers must be registered with RERED and comply with its standards.

3.2 ORGANIZATIONAL PROFILE

3.2.1 Structure and Operation

SEEDS' mission is to "eradicate poverty by promoting economic empowerment of rural people for a sustainable livelihood."¹⁹ To achieve its stated mission, SEEDS not only provides credit for enterprises and livelihood improvement but also a bundle of non-financial services, such as business counseling, transfer of technology and technical skills, market information and linkages, and training in business management and entrepreneurship.

In its target market, credit is extended to enterprising individuals to start or expand micro-business ventures or engage in self-employment activities. In addition, SEEDS provides credit to those who need capital support to access energy solutions, such as SHS, and access to primary grid or village hydro projects.

SEEDS is registered as a limited liability company (not-for-profit) under the Companies Act No. 17 (1982), and has been in operation since 1998. In 2006, SEEDS had branch offices in 27 districts in Sri Lanka, with a client base of 887,430, and 161,461 active borrowers.

SEEDS' senior management has considerable microfinance experience. Most of its district managerial staff has been with the organization for a decade (initially with Sarvodaya, the parent NGO). Over the years, SEEDS has made considerable effort to improve its systems and bring them to par with international standards. However, it has not enforced stricter performance and efficiency standards among its staff, leading to a slow decline in portfolio quality and financial performance.

SEEDS has a separate sub-division for energy lending, called Alternative Energy. The banking director heads the non-energy lending while the deputy banking director oversees energy lending. Of its 27 branch offices, 20 branches offer energy loans. These branches have separate staff for energy lending, headed by a deputy manager who also reports to the district manager. Non energy-lending is conducted through Sarvodaya societies (village societies), which have around 100 members and are further sub-divided into smaller groups of 5–7 members. Energy lending is generally offered to individual clients (who mostly are not members of a Sarvodaya society) and electricity co-operative societies (ECS).

19. See <http://www.seeds.lk/>.

Accounting and management information system (MIS): SEEDS has installed new accounting/MIS software, developed by Informatics Private Ltd., specifically for its energy program, which at the time of the field research visit was being pilot-tested in two branches. The software has the capacity to generate a number of detailed client, field officer, vendor, and area portfolio analyses plus overdue ageing analysis. The other branches maintain portfolio quality information on Microsoft Excel, which is updated monthly. At present, the organization only prepares a separate profit and loss statement for the energy program and no balance sheet. (A consolidated balance sheet is prepared for the entire microfinance program, energy plus non-energy lending.) For accounting, MIS software is installed both at the head office and branch/district levels. Loan loss reserve is based on Central Bank norms, which are liberal, compared to international microfinance standards.

Portfolio management: Portfolio management for SEEDS' energy program needs to be strengthened by gearing up its internal checks and balances. Although the clients are mostly small farm and non-farm entrepreneurs who have reasonably stable cash flows, SEEDS' overall portfolio quality and management capabilities have been effected by several extraneous factors—e.g., natural calamities (floods and landslides in many districts and the 2004 tsunami), ethnic clashes in certain regions, and harvest problems. Unplanned grid extensions have also negatively affected the quality of the energy portfolio, especially in the areas with solar loans. SEEDS has a buy-back arrangement with vendors in the event of grid extensions; however, this has not been always feasible when the removal rate is high.

Business planning and financial management: The process of business planning within RERED is quite elaborate, based on previous year's figures, market trends, and expansion plans of suppliers and targets are allocated to each district accordingly. These figures form the basis for SEEDS' corporate plan for its energy division and is fine-tuned by the local cohort and sent back for approval. However, it appears that the banking division's central plans have not yet fully incorporated the energy plans and projections into their central business planning process.

There have also been a few instances where management crises at some energy companies have seriously affected SEEDS' business plans, and SEEDS has had to take over managing the energy product stocks, which is not its core competency. Other factors that have affected its energy lending program are a market crisis where sales dropped island-wide, and a decision to consolidate the energy lending program despite ambitious plans for it. As a result, the current challenge for SEEDS management is to maintain the fine balance between expansion and scaling up in order to make the energy portfolio profitable as early as possible versus consolidating the energy lending processes, systems, and plans in the face of external shocks and market failures.

Cash management: SEEDS has adopted a conservative cash and liquidity management strategy, since a large proportion of its assets are either bank deposits or cash. This approach was followed to maintain adequate cash reserves so as to offset current liabilities, including loan repayments to RERED (given its weak portfolio quality), and to meet short-term business targets (refinance from ADB was delayed). This also explains why the energy portfolio has not grown over the last year despite an increase in the prices of SHS.

Future funding: SEEDS' support from RERED ends in 2007, but RERED is currently contemplating a program extension for another three years and details are being worked out. SEEDS is also exploring other funding opportunities by engaging with Ashden Awards 2006 and others. Management is positive and feels that mobilizing new sources of funds may not be a major issue in the medium term; however it has yet to decide whether it will expand its energy lending to newer areas or just consolidate the existing program. Although SEEDS is working to improve operational efficiencies and provide better services to its clients, an important factor that may affect SEEDS' decision to continue the energy lending program is the steady influence of various external market forces and the extent to which they can be managed.

Internal audit: SEEDS has an internal audit department which is responsible for conducting branch audits annually. However, policy and field audits are almost non-existent. As a result, any current audit lacks adequate scale, frequency, and rigor. The senior staff at the branch office is not well-skilled in operational risk management.

3.2.2 Funding Sources

For its operations, SEEDS has obtained loans funds from various sources. In addition to this, SEEDS is supported by donor funds and has access to society savings and savings of individual members through various deposit schemes (used only for non-energy lending). Both ESD and RERED loans are to be repaid in ten years in half-yearly installments. Besides these loan funds, the organization received training grant support from Estimos and the World Bank, and revolving loan funds from Asian Development Bank of around LKR 62 million (US\$ 596,211) for grid-connection loans until June 2006.

3.3 ENERGY LOAN PORTFOLIO

3.3.1 Model and Methodology

The energy lending model and methodology adopted by SEEDS is entirely different from their non-energy lending. Its general credit product is offered through Sarvodaya societies, comprising of 60–100 households in a village, while the energy program mostly lends to individuals and has little client overlap with the non-energy program.

Of the three energy loan products offered by SEEDS, it adopted individual lending methodology for SHS and grid-connection loans. However, micro hydro loans are offered through an electricity co-operative society (ECS), which is comprised of all beneficiary households who gain access to electricity through the micro hydro project.

Table 3.2 Differences Between SEEDS' Non-Energy and Energy Loans

	NON-ENERGY	ENERGY
Products	Income generation, consumption, employment and pawn loan	SHS, grid, and micro hydro
Loan size	LKR 10,000–500,000 (US\$ 96–4,808)	LKR 15,000–100,000 (US\$ 144–968)
Interest rate	16–22% declining p.a.	- SHS: 10% flat p.a. - Grid: 8% flat p.a. - Village hydro: 16% declining p.a.
Loan Term and Installment	1–5 years, mostly monthly installment	2–6 years, monthly installment
Equity contribution	25% of the project cost in case of employment generation loan	- SHS: 15% - Grid: 20% - Village hydro: 50–70% (incl. grant)
Loan appraisal	Up to LKR 50,000 (US\$ 480): Field staff Up to LKR 100,000 (US\$ 960): District committee Loans > LKR 100,000 – Head office	- SHS and grid loans: District office - Micro hydro loans: Similar to society loans and appraised at district office
Disbursement	Members of Sarvodaya societies	- SHS and grid: Individual clients (mostly non-Sarvodaya members) - Micro hydro: Members of ECS
Collection of Repayments	Responsibility of Sarvodaya society manager	Responsibility of field staff
Cash handling	Field staff not allowed to collect or disburse cash	Field staff collects repayment in cash, disbursements are made as checks

Table 3.3 Characteristics of SEEDS' Energy Loan Products

	SHS	GRID CONNECTION	VILLAGE MICRO HYDRO
Target area	No expectation of grid connection for 4 years	Availability of grid for last 2 years	Areas where grid is unlikely to reach
Interest rate	10% flat p.a.	8% flat p.a.	16% declining p.a.
Other fees	LKR 700 (US\$ 6.73) for non-Sarvodaya society member		
Loan period	3–4 years	2 years	4–6 years
Grace period			During construction
Loan size (LKR)	LKR 25,000–100,000 (US\$ 240–962)	LKR 15,000 (US\$ 144)	30–50% of total project cost
Equity requirement	15%	20%	50–70% (include grants)
Capacity	20–60 Wp	230 watt	5–20 kW
Capital expenditure	LKR 40,000–100,000 (US\$ 385–962)	LKR 18,000–40,000 (US\$ 173–385)	LKR 1–2 million (US\$ 9,616–19,232)
User profile	Individual	Individual	Electricity co-operative society
Marketing and Outreach	Company	CEB	Project developer
Nature of Contract	MOU that stipulates minimum product and service standards	Affidavit that allows CEB to disconnect if clients fail to repay	
Other features	Buy-back scheme		Village technicians
No. of units installed or customers	Approximately 58,000 units	3,692 customers	14 units
Payment scheme	Monthly	Monthly	Monthly

3.3.2 Characteristics

The total number of borrowers for energy program was, as of June 2006, over 58,000 for solar loans, 3,692 for grid loans, and 14 ECS for village hydro loans. The SEEDS energy loan portfolio is 30.8 percent of its total microfinance portfolio, and the total loan outstanding, as of June 2006, was LKR 955.1 million (US\$ 9,184,537). Of this, 94.2 percent of the portfolio was solar loans, 5.5 percent was grid loans, and 0.2 percent was village hydro projects.

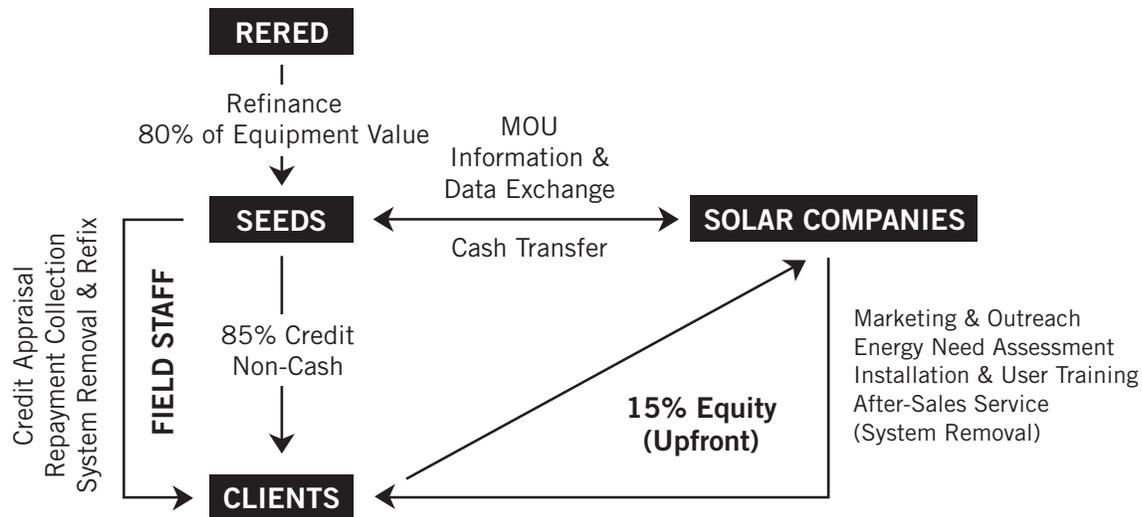
SEEDS' solar loans has shown strong growth, approximately 200 new systems installed in 1999 compared to 13,527 new systems in 2005—in other words, averaging 10 systems per month in 1999 and 1,119 systems per month in 2005.

3.3.3 Relationships Between Energy Suppliers, SEEDS, and Consumers

Solar loans: Solar loans constituted 94.2 percent of the total energy portfolio as of 30 June 2006. SEEDS has collaborated with 11 solar companies in Sri Lanka and has signed MOUs with them that define roles, work norms, and procedures to be followed by each partner. SEEDS provides the financing while the solar companies handle marketing, preliminary loan appraisal, installation, user training, and after-sale service. The staff members of the solar companies present information about the SEEDS loan products and have loan application forms in case a client cannot purchase the equipment in cash. If the client is interested in a loan, the staff members make a preliminary loan appraisal, often file the loan application on behalf of the client, and submit it to the SEEDS district office. Once the loan is appraised and sanctioned by SEEDS, the company staff installs the equipment at the client's house and collects 15 percent of the equipment value as a down payment. SEEDS disburses 85 percent of the equipment value as

a loan to the client, but payment for the equipment is made directly to the solar company. New or small solar companies are paid only 80 percent of the equipment value because SEEDS retains 5 percent of the disbursed value as a savings deposit to be used in case the company fails to perform.

Figure 3.1 Stakeholder Relationships in a Solar Loan



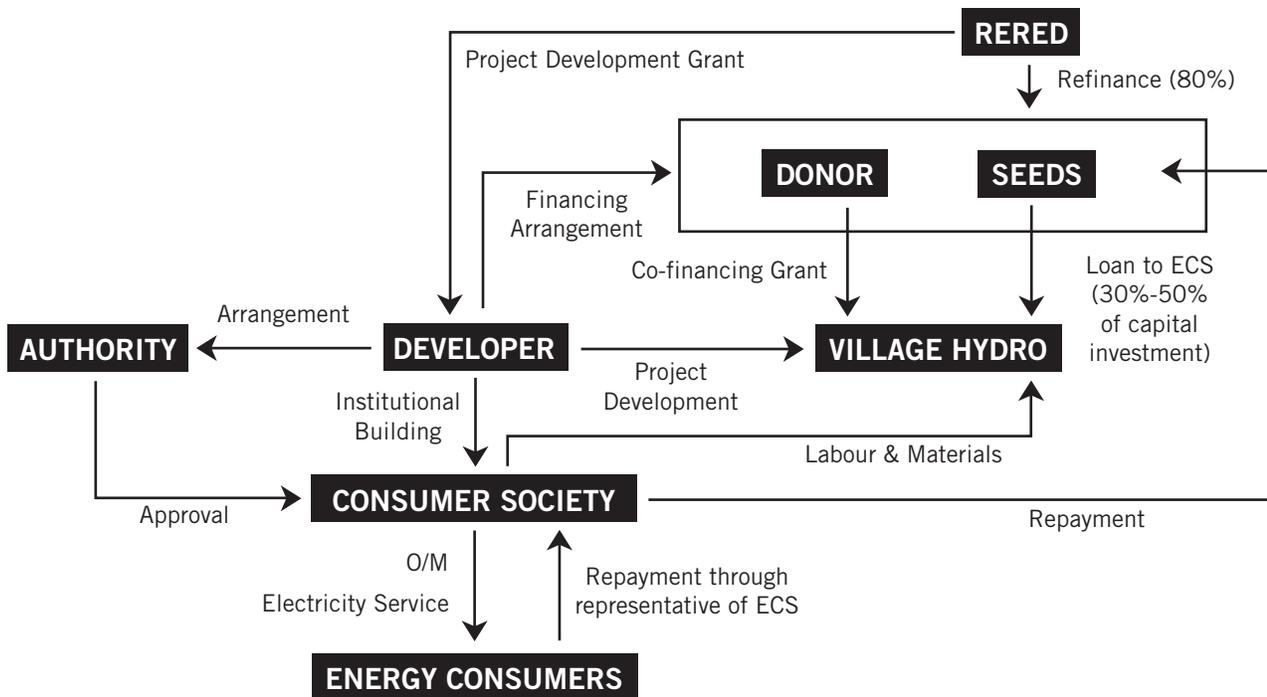
The solar companies must ensure that they comply with quality standards established by RERED to be eligible for its refinance facility. To reduce technical risk, standards are set for warranty requirements, hardware specification, maintenance, inspection, and buy-back guarantee. The companies are required to provide user training to the client at time of installation along with a properly documented user manual, including the warranties. They must also provide compulsory routine maintenance within five months of installing the equipment and routinely every six months thereafter for three years. A client can register complaints directly to the company or through SEEDS.

Village hydro loans: Village hydro units are built, owned, and operated by the community itself through electricity co-operative societies (ECS) set up for the purpose. They are financed by a mix of sweat equity from the community (which provides labor and in-kind contribution toward construction of the essential infrastructure, such as diversion channels and turbines), loans from SEEDS, and project grants. A micro hydro project is initiated and managed by a project developer (an independent project preparation consultant), who plays a critical role in bringing together different stakeholders and managing multiple requirements for the successful implementation of the project.

A project developer manages community mobilization, ECS formation, site selection, feasibility studies (including technical and socio-economic aspects), and submission of business plans and other documentation for bank loan negotiations. The developer also assists the ECS in mobilizing equity and grants, obtaining regulatory and local government approval for the project, soliciting independent quotations from suppliers, and advising it on selection of suppliers. Once all the ground work is finished by the developer, SEEDS—based on the individual loan applications from ECS members—approves the loan (30–50 percent of the total project cost). Most of the loan is paid directly to equipment suppliers and the balance to the ECS.

The equipment quality standards are established by RERED. Suppliers must be registered with RERED and comply with the standards to be eligible for refinance. The ECS is expected to enter into a direct agreement with the energy equipment supplier. To ensure that the project runs smoothly, the developer is required to train ECS members in the operation and maintenance of the micro hydro and in record keeping. The developer gets a project preparation grant of up to US\$ 6,000, which is only paid when a specific project milestone defined by RERED is reached. The size of each individual loan is subject to the cost of the system, the grants made available to ECS by government or donor, and

Figure 3.2 Stakeholder Relationships in a Village Hydro Loan



the number of ECS members. An ECS representative collects monthly payments from the other members to cover the maintenance and operation costs of ECS as well as the loan repayment, which is then remitted to SEEDS every month.

Grid loans: SEEDS collaborates with the Central Electricity Board (CEB) of Sri Lanka. CEB markets SEEDS' loan products to potential clients visiting its office and provides the grid connection. CEB also provides cost estimates for clients interested in a loan to install the grid connection—this is mandatory to confirm that the loan applicant is a prospective grid client. Based on cost estimates, SEEDS screens the creditworthiness of the client. Besides evaluating livelihood and income, it also ensures that the client owns the house. As required by the loan scheme, when the loan is approved, 20 percent equity is collected by SEEDS from clients and utilized for payments to service suppliers. SEEDS transfers the loan (loan ceiling is LKR 15,000 [US\$ 144]) directly to CEB and only then is the grid connection initiated. Any additional costs must be covered by the client. ADB provides 100-percent refinance to SEEDS for grid-connection loans. SEEDS has grid loan clients sign an affidavit that authorizes CEB to disconnect power in case of default.

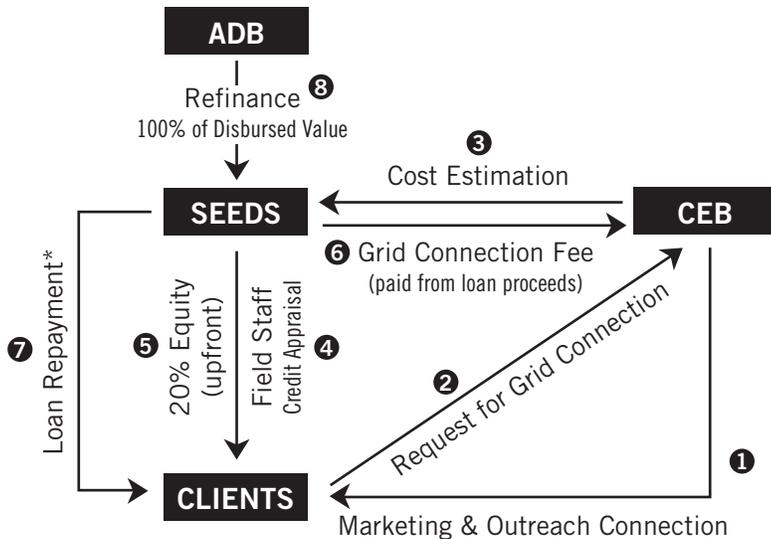
3.3.4 Energy Clients and New Markets

The energy clients visited during the field research were mostly involved in rubber and tea plantation and farming. Others were self-employed in non-agricultural businesses, such as iron welding, carpentry, tailoring, etc. The income pattern for most was seasonal, or monthly for the others, and average monthly income ranged from LKR 4,000 to LKR 23,000 (US\$ 38–221).

The typical electrical energy needs of these clients are for lighting, TV, video player, fan, and some kitchen appliances. Before installing SHS or a grid connection, these clients mostly used kerosene for light (8–20 liters at LKR 48 [US\$ 0.46] per liter). For cooking, most clients burned fuelwood, which they collected from the surrounding area. Many clients, however, also used an LPG cookstove, but LPG consumption was minimal—about one cylinder every four to eight months.

SEEDS energy lending is characterized by its client-friendly, door-step services, which are highly valued by its clients (more than 50 percent, according to an internal SEEDS' impact study of solar loans in 2002). From providing

Figure 3.3 Stakeholder Relationships in a Grid Loan



*Repayment through field officer, society, or directly deposited by clients at district office

product information to installation to user training, maintenance, and loan collection, all services are provided at the house of the clients.

By August 2006, total installed capacity from SEEDS' loans reached 2,360 kW for solar, 849.1 kW (estimated) for grid connection, and 118.4 kW for village hydro. Based on the SEEDS impact study, the energy use by the clients ranges from household to productive activities. Based on SEEDS statistic, 565 clients use solar photovoltaic for productive and social uses, ranging from groceries/markets (402 clients, by far the most use), manufacturing/home industry (54 clients), animal husbandry, solar centers, agricultural product processing, service industry (hotels, restaurants, salons), farm security, and religious centers (temples, mosques).

Clients visited during the field research visit used kerosene for lighting prior to buying SHS or getting connected to the grid. Almost all households used fuelwood for cooking.

Energy Forum, an NGO promoting renewable energy in Sri Lanka, has estimated that the market potential for solar systems is at least 200,000 systems, and 1,000 schemes for village hydro. (So far, 250 schemes have been installed.) Another alternative technology that is still being developed and implemented is biogas. With farmers constituting more than 56 percent of energy consumers in rural areas, biogas has huge potential.

3.3.5 Administration and Management

SEEDS has a separate energy division with separate staff to administer and manage the energy lending. Although it uses SEEDS' infrastructure (head office as well as branches), the energy division pays SEEDS a fixed sum every month to use its resources. The energy program maintains detailed accounts of its income and expenses, preparing an annual income and expenditure statement (but it does not prepare a separate balance sheet). The energy program is monitored by the energy division at the head office and deputy district manager at the branch office. However, field-level monitoring is inadequate for its present scale.

SEEDS' energy division along with its training division has organized several training sessions for its staff and hired professionals—who are either technical managers of solar companies or trainers from the Solar Industries Association (SIA)—to conduct them. Some of the initial awareness programs for CEB and financial institutions were offered by Energy Forum on behalf of ADB.

3.3.6 Financial Analysis

SEEDS energy loan portfolio is less robust than its non-energy portfolio. As of 30 June 2006, SEEDS had portfolio-at-risk greater than 60 days as high as 35 percent, and a cumulative repayment rate of only 86 percent. Solar loans constituting 94.3 percent of total energy portfolio have high defaults, partly due to the difficulty in following up with these clients, who largely live in remote villages. Of the three energy loan products offered, solar loans had an 85-percent recovery rate by due date. Grid loans, on the other hand, had a 100-percent repayment rate.

Of the 13 village hydro projects, 12 projects had a 100-percent repayment rate, and one project has defaulted despite operating successfully. The project in default had LKR 980,000 (US\$ 9,424 outstanding). The initial target was to promote 25 village hydro projects, but currently SEEDS wants to slow down because it is not sure of the long-term sustainability. While ideally the ECS-based village hydro scheme is a good concept, in practice, however, the success of the project rests on the cohesiveness of the ECS and its leadership. Any problem within the ECS has the potential to threaten the long-term sustenance of village hydro.

Table 3.4 Sample Client Loan Profile, SEEDS

DESCRIPTION	% OF TOTAL INCOME	
Income per month	LKR 7,000 (US\$ 67)	
Loan purpose	Grid connection	
Loan amount	LKR 15,000 (US\$ 144)	
Loan installment	LKR 730 (US\$ 7) per month	10.4%
Energy cost prior to grid connection		
Baseline expenditure on kerosene	LKR 720 (US\$ 6.92) per month	10.2%
Energy cost after loan repayment		
Grid billing cost for the month	LKR 449.5 (US\$ 4)	6.4%

Overall, the energy program was profitable as of 31 March 2006, with a Return on Asset (ROA) of 1.5 percent. However, the margins are thin and have declined from 2005 due to increased cost. An increase in salaries along with new staff recruits has resulted in higher personnel costs. The portfolio has remained stagnant, as has the income from portfolio (only 9 percent growth), leading to a decline in profits. The yield on portfolio is low at 12.1 percent against a weighted annual percentage rate of 18.2 percent due to weak portfolio quality.

3.3.7 Impact Analysis

Most clients visited by the Asia Research Consultant used the energy loan for consumption. Before purchasing solar photovoltaic equipment, these clients used 15–20 liters of kerosene per month, costing approximately LKR 720–960 (US\$ 6.92–9.23). The monthly loan payment for these clients ranged from LKR 1,250 to LKR 1,830 (US\$ 12–17.60), depending on the loan amount and loan term, and constituted 4–12 percent of their monthly income. However, once the loan is fully repaid, the client then saves the expense of kerosene, about 2–7 percent of monthly income.

Clients with grid-connection loans also had used 15–30 liters of kerosene per month for lighting, costing LKR 720–1,440 (US\$ 6.92–13.85) per month; their loan installment ranged from LKR 730–LKR 940 (US\$ 7–9). Of five grid-loan clients visited, only one had received a bill from CEB. The cost of the loan installment was almost equivalent to the baseline expense of client for kerosene, but the client still had to pay the electricity bill. Once the loan is paid, the client pays only for electricity consumption. If this continues at the same usage, it will be lower than the baseline expense for kerosene. Some of the obvious benefits observed during the field visit were overall better

quality of life, access to better light for children for studying, ability to work longer in existing productive activities, and access to better and more diverse TV and radio entertainment.

3.4 DISCUSSION—SEEDS

3.4.1 Highlights and Challenges of the SEEDS Energy Lending Model

Highlights

- *Client-friendly, door-step services* that SEEDS offers are highly valued by clients.
- *SEEDS energy-lending program has a separate department for management and administration*, an important factor enabling SEEDS to scale up its energy-lending portfolio.
- SEEDS has *excellent market credibility* and reputation as a pioneer in microfinance and energy lending in Sri Lanka. It has been able to mobilize funds from a wide range of lenders for its microfinance program and obtain favorable long-term credit from RERED.
- Its *microfinance outreach is almost island-wide*, and its energy program is operational in 20 districts. Current infrastructure provides a wide geographical base from which to expand energy access.
- *Strong, well-developed energy stakeholders* have made SEEDS' credit facility for energy products possible. SEEDS' energy partners work well in tandem, optimizing their particular expertise to develop and strengthen the energy market. Solar companies market energy and loan products, profile client energy needs, conduct preliminary credit appraisals for SEEDS loan, and provide sales and after-sale service via decentralized networks. CEB offers expanding access to grid connection and helps market and promote SEEDS loans to its clients. Project developers are instrumental in conceiving and managing entire village micro hydro projects. SEEDS provides the credit facility to bridge the financial gap.
- The *different risk mitigation strategies* adopted by SEEDS are key to minimizing technical and credit risk: these were buy-back options, five percent of the loan held as a hedge for small and new solar companies, and provisions to repossess solar panels or disconnect electricity in case of loan default. SEEDS also initiated an internal insurance program for solar loans to help borrowers and to cover itself from damages caused by natural disasters or other external conditions. The risk fund was started because low-income borrowers were unable to invest 2.5 percent of the asset value annually as an insurance premium. This innovative product of SEEDS has also been replicated by other experienced, international energy lenders as well.
- *The SHS subsidy* has enabled energy and microfinance stakeholders to scale up SHS outreach in rural areas, especially in light of increasing SHS prices.
- *SEEDS' insistence on RERED-required quality standards* for both SHS and micro hydro keeps it eligible for refinancing funds, and its MOUs with solar companies define operational standards, define work norms and procedures to ensure quality packages for clients.
- *SEEDS was self-motivated to introduce energy lending*, in keeping with its mandate to provide comprehensive service to its clients. Its early efforts focused on creating awareness of solar photovoltaic technology and installing solar systems in communal locations, such as temples and churches, to demonstrate and introduce them (through Sarvodaya, its parent company). These initiatives, although small, were funded by internal funding sources. Over a period of time, SEEDS was able to show a measure of success and was made a PCI (especially noteworthy, since MFIs were not qualified to become PCIs at that time), and was able to attract subsidized funds from RERED and ADB.

Challenges

- ***SEEDS is dependent on the RERED-subsidized loan fund.*** Presently the weighted average cost of funds from RERED is 6.6 percent per annum, which just allows the program to break even and make small profits. However, if the government programs were to end, which currently form the bulk of SEEDS funding sources, it may be difficult for SEEDS to break even by borrowing at existing market rates of 10–12 percent per annum.

SEEDS' pricing policy needs back-up solutions should interest rates significantly increase—which would also affect the market for energy lending. Past experience has shown that the solar consumers in Sri Lanka are sensitive to price. The availability of a price subsidy and subsidized interest rates contributed significantly to the high growth of solar market in Sri Lanka; without these, the market could drop considerably.

- SEEDS' non-energy program has a huge client base, but ***the energy program has not been able to take advantage of this existing client network.*** SEEDS originally tried, but failed given the market segmentation and client profile of its energy and non-energy clients. Energy clients in non-grid areas, especially those opting for solar loans, generally reside in remote villages, whereas non-energy clients reside in villages which have better access. This has kept the operating cost of servicing energy clients on the high side.
- ***SEEDS has limited initiatives or opportunities for product development or innovation***—as do most other MFIs. The designs of its existing loan products were based on a market survey, considering such factors as amount of client's income spent on lighting, seasonality of cash flows, and affordability of cash security, and are modified periodically based on experience. Still, RERED and donor trends remain a major driving force in the continuation of the current government energy program. SEEDS has wanted to do a full market study to identify the varied energy needs of its clients and explore additional energy products to introduce, but finds it a heavy investment. For the same reason, few manufacturers are willing to invest in new products as well. Also, no specific effort to create a market for energy entrepreneurs or promote energy for productive purposes has been made.
- ***SEEDS' financial analysis of its energy program is not adequate,*** despite having a separate department for energy lending. SEEDS does not prepare a separate balance sheet for the energy program, although a detailed branch-office profitability analysis on energy analysis is underway.
- ***Considering SEEDS' portfolio size, its insurance fund is small.*** SEEDS' internal insurance fund, as of 31 March 2006, was LKR 39.8 million (US\$ 382,729), and claims have usually been around 10 percent of the fund. However, SEEDS also has a risk assurance fund on a contributory basis, which helps borrowers and covers SEEDS from natural disasters and external conditions. The terms for honoring claims are explained to the clients and are properly documented.
- ***SEEDS has weak portfolio quality*** with PAR>30 days as high as 42 percent and PAR>60 days at 35 percent. The weak portfolio quality is primarily the result of SHS loan defaults: SHS loans constitute more than 90 percent of the energy loan portfolio. Weak portfolio quality has resulted in thin margins despite low operational costs. SEEDS' priority is to improve the quality to acceptable levels, and a work plan has been drawn up and targets set for such purpose. Since the weak portfolio is also affected by uncontrollable external conditions, it is important that MFIs have the capacity to absorb volatile conditions.
- ***SEEDS management is not yet fully geared to handle the challenges of energy lending*** which has led to a relatively weak portfolio of energy loans compared to their general portfolio. The primary reason for this is the profile of clients for energy loans is very different from the non-energy clients in terms of their

location and accessibility. Therefore SEEDS needs to build in systems to incentivize the field officers as well as other staff for the additional effort that needs to be put in place to build and successfully monitor an energy loan portfolio.

- ***SEEDS' support from RERED ends in 2007.*** RERED is currently renegotiating a program extension for another three years (details are being worked out), with a substantial fund reserved for off-grid solar. SEEDS is also exploring other funding opportunities, such as the Ashden Awards 2006 and others. SEEDS has a substantial amount of internally generated funds for energy lending as well, and repeat funds should also be available for grid loans. Although management feels positive that mobilizing new sources of funds may not be a major issue in the medium term, it is contemplating whether to expand its energy lending to newer areas or just consolidate the existing program. SEEDS is working to increase operational efficiency and provide better services to its clients, but an important factor that may direct SEEDS' decision to continue the energy lending program is the effect of various external market forces and the extent to which they can be managed.
- ***SEEDS' energy stakeholders feel that micro hydro projects are expensive and cannot be implemented without grant support,*** questioning sustainability. SEEDS funds only 30–50 percent of the project cost while the rest of the funds originate from grants and ECS-member contributions. Grants also support project developers who are crucial to micro hydro projects. The long-term sustainability of the project also depends on the socio-economic and political dynamics among ECS members.

3.4.2 Obstacles and Barriers

- Although SEEDS is fortunate to have different energy stakeholders to collaborate with, it ***continues to face problems in implementing its solar loan product.*** One reason for the high default rate in solar loans is the unplanned expansion of grid lines to new areas by CEB. Moreover, competition between solar companies at times has prompted them to sell equipment to clients without a loan appraisal by SEEDS staff. This created problems for SEEDS in the past, but SEEDS has emphatically communicated to the companies that it would not finance such sales.
- ***Prices of solar home systems have increased by almost 25–30 percent*** over the past few years, becoming expensive for the rural poor. SEEDS fears that further increases in prices will make SHS unattractive and unaffordable for the poor.
- Providing energy lending to consumer-based societies, such as an electricity co-operative society, made ***SEEDS vulnerable to the leadership quality and consistency of the respective ECS***—which is much more difficult to control than loans to individuals. Such a challenge has dampened SEEDS' interest in expanding its portfolio for the village hydro scheme loan, and a different approach may need to be taken by RERED or sector facilitators to mitigate such risks.
- ***Most stakeholders feel that innovation and introduction of new products is too costly.*** Unless grant support is available to infuse seed capital and bear the initial high cost, it is not possible for stakeholders to design and market new products. SEEDS itself has several interesting ideas for deploying solar technologies, such as promoting use of solar lights to protect crops by chasing away elephants, and solar water pumping and drip irrigation. It has also completed a pilot project for financing solar driers for pepper drying. However, the production costs for some of this equipment is prohibitive and does not encourage new suppliers to enter the supply chain or financiers to finance these untested ventures.

3.4.3 Key Lessons Learned

Adequate risk protection is necessary. In designing an energy-lending program, such as SEEDS, it is important to build in adequate controls to safeguard various technical and credit risks. MOUs and clauses to define clear roles and responsibilities of microfinance and energy stakeholders under different possible circumstances are an important starting point. It is also imperative that both energy and microfinance stakeholders understand each other's operations and co-ordinate and co-operate with each other in expanding energy access.

Establish clear performance indicators for energy program. Creating a separate division with its own resources and staff for energy lending helped SEEDS scale up its energy portfolio. However, it is also important that the clear operational and financial performance indicators be established to analyze the progress and performance of energy program upon which prudent financial decisions can be made. SEEDS does not conduct the required analyses of its energy program separately, as of now.

Extend outreach to energy entrepreneurs. SEEDS has done well in reaching out with its energy products to end users. However, the energy program should not limit itself to that and should widen its outreach by promoting energy entrepreneurs. Creating energy entrepreneurs will reduce the transaction and delivery costs for the MFI on one hand, and on the other, enable it to reach out to a wider client-base with different economic profiles.

Provide insurance. Insurance is an important and valuable service that the client requires, especially if the average loan amount is high. The client can suffer substantial loss if the equipment is damaged. However, this service should be offered either in collaboration with a formal insurance company or as an internal policy where the liability is restricted to the amount of the insurance fund. SEEDS, for example, has a huge contingent liability since the insurance fund it can mobilize is small in comparison to its overall energy portfolio, which is not advisable.

3.4.4 Opportunities for Country Scale-Up and Regional Replication

Client database and profiles: MFIs need to build a specific database of client information that profiles the energy needs of potential clients among other characteristics. The energy profile of the client should look into their energy requirements for household consumption as well as income-generating activities. The database can be essential for introducing innovative alternative energy solutions that have the potential to save on costs or generate more income for the clients.

Product and market innovations: Innovations are required on three fronts to expand and scale up energy access. Energy stakeholders need to identify and introduce income-generating energy products for end users, such as solar dryers, in addition to energy products only for household purposes. Scalable energy products that do not need to be heavily subsidized by grants and can be easily sold or installed are obvious targets to focus on. New energy service enterprises that sell or rent energy services and expand outreach to end users should also be introduced and encouraged.

Franchises can be employed to nurture the decentralized growth of energy service companies. So far, the marketing and promotional role in the SEEDS model has been the exclusive purview of energy service companies. The MFI's separate energy division could also employ a team to design new marketing strategies to expand energy access. Marketing by energy players helps maintain low cost, but at the same time participation by MFIs can help scale up the energy portfolio much faster. For its energy program, an MFI should build some marketing and promotional costs into its interest rate structure.

External funding and support: Donor funding can be sought to support market studies that identify the potential of existing as well as new alternative energy solutions in Sri Lanka (based on the energy client database). It also can infuse initial seed capital and help with early operational costs to build a service infrastructure to introduce new innovative technology and replicate it on a wider scale.

MFIs also require capacity-building support to meet international financial accountability standards for energy lending. The institutional capacity needs to be increased to include various elements, such as delinquency management, credit and technical risk management, better internal controls, and energy-specific financial planning and budgeting.

More efficient operations: If SEEDS intends to scale up its energy lending program without external support from programs like RERED, it needs to improve the profitability of its energy lending portfolio and generate larger profit margins to make the program self-sustainable. SEEDS is making efforts to enhance its portfolio quality by building systems for improving its cost efficiency and credit discipline for better loan repayment. It is also working to instill measures for better staff accountability. However, SEEDS still needs to expand its target market to achieve economies of scale for energy lending by collaborating with energy sector facilitators and players and vigorously exploring better energy products and new provision strategies. Guided by its future vision, SEEDS is moving in that direction.

CHAPTER 4 • NUBL—NEPAL

4.1 NEPAL COUNTRY CONTEXT

4.1.1 Socio-economic Environment

Nepal has a population of about 28 million and a land area of 14 million hectares and is one of the least developed countries in the world. Estimates suggest that 40 percent of the population lives below the poverty line. The gross domestic product of 2.7 percent (2005 estimate) is low, the population growth rate of around 2.2 percent per annum is high, and 84 percent of the population lives in rural areas.

Further, a weak social infrastructure—evident by its 2002 UNDP Human Development Index rank of 140 out of 177—reflects gender inequality, rural-urban regional disparities, and poor health facilities. Income distribution is also strongly skewed: the highest quintile accounts for 44.8 percent of total income or consumption between 1995 and 1996 and the lowest quintile for 7.6 percent.²⁰

4.1.2 Banking Sector Overview

Nepal's formal financial system began with the establishment of the Nepal Bank Limited (NBL) in 1937, followed by Nepal Rastra Bank (NRB, Nepal's Central Bank), in 1956. Over time, other institutions, banks as well as non-banks, were set up and integrated to form a substantive financial system. However, foreign banks were only allowed to operate in Nepal in 1985. After liberalization, the financial sector made substantial progress in increasing the number of both financial institutions and beneficiaries of financial services. However, a large proportion of the market (more than 86 percent) remains in the hands of commercial banks.

Total assets of the financial system grew continually over the last five years, at an average rate of 16 percent per annum. A major proportion of the loan portfolio of the banking system was distributed as productive loans (35 percent) and to the wholesale and retail business sectors (almost 20 percent).

Various financial sector reform programs, implemented over the past few years, have contributed some improvement to the financial health of problem banks. However, the financial sector is still at risk. It is challenging to maintain financial sector stability in the face of the current level of non-performing loans (NPL) at 18 percent.

4.1.3 Finance and Microfinance Sectors and Regulation

The formal financial sector consists of commercial banks, development banks, finance companies, and microfinance banks. Development banks formed under the Development Bank Act (1996) are extending microfinance activities into rural areas. These banks include both regional rural development banks in the government sector and microfinance development banks established by the private sector. A large number of societies and co-operatives occupy

20. Sanjay Sinha, "Nepal," in *The Role of Central Banks in Microfinance in Asia and the Pacific: Country Studies*, vol 2, by John Conroy, Robyn Cornford, Ruth Goodwin-Groen, Gilberto Llanto, Paul McGuire, and Sanjay Sinha (Metro Manila, the Philippines: ADB, 2000). It can often be extremely difficult to find sufficient, accurate economic and financial data (which may not even be available at all, much less be confirmable) in Nepal, hence the use of the aged figures here.

an important position in the rural finance sector. Financial intermediary non-government organizations (FINGOs) are NGOs that offer financial services and are licensed by NRB. Savings and credit co-operatives (SACCOS) are member-owned, -controlled, and -capitalized organizations that provide financial services to members. There are more than 2,400 SACCOS registered with the Co-operative Department in Nepal. There are also many unregistered savings and credit groups in Nepal. The vast majority of these grew out of assorted development initiatives.²¹

Over the last few years, consolidating the financial sector and maintaining its stability have been important objectives of NRB's monetary policy. To achieve these objectives, various financial sector reforms, such as strengthening the inspection and supervisory capacity of the Central Bank, establishing the Debt Recovery Tribunal, strengthening the Credit Information Centre, etc., have been implemented.

NRB has also played an unusual development role, justified by lack of commercial bank interest in lending in rural areas and the weakness of the formal microfinance sector. As a result, commercial banks are required to invest 3 percent of their total loan portfolio in the unserved sector. Based on current figures, 17 commercial banks now extend credit to the poor, and it is estimated that two-thirds of these loans are made by two public commercial banks, NBL and Rashtriya Banijya Bank.

NRB has directed such microfinance-oriented programs as the Intensive Banking Program, which introduced group guarantee mechanisms in place of formal collateral; and the Production Credit for Rural Women and Microcredit for Women, which targeted low-income women and were supported by donor agencies (such as IFAD and ADB). In 1992, NRB introduced the Grameen Bank model in Nepal by establishing five regional rural development banks, each operating in a separate development region. NRB also manages the Rural Self-Reliance Fund, established in 1991, which provides wholesale lending to NGOs, co-operatives, and financial intermediaries.

Various laws regulate MFIs in Nepal: the Nepal Rastra Bank Act (2002), Agriculture Development Act (1967), Co-operative Act (1972), Finance Company Act (1985), Development Bank Act (1996), Social Welfare Act (1991), Company Act (1947), Financial Intermediary Act (1998), and the Insurance Act. The microfinance sector appears to be over-regulated, but the reality is just the opposite. It is difficult to regulate MFIs because they have been established under different acts, each of which may have legislated microfinance activities when enacted. The role and regulation of the different financial institutions in Nepal are detailed in Appendix 6.

4.1.4 Energy Scenario Overview

Energy consumption in fiscal year (FY) 2004–2005 increased by 1.35 percent to 8,616 TOE, compared to FY 2003–2004, and increased by 3.34 percent to 8,904 TOE in FY 2004–2005. Energy in Nepal is divided into three categories according to its sources—traditional (86.71 percent), commercial (12.72 percent), and renewable (0.56 percent)—as of FY 2004–2005. Nepal's energy intensity is 1.28 times Asia's and 0.92 times the world average, which indicate the inefficiency of Nepal's energy consumption and impact on economic growth.²²

Electricity consumption in Nepal is among the lowest in Asia, both per capita and per unit of gross national product (GNP): 186 kWh of electricity was consumed per US \$1,000 of GNP. Sector consumption of electricity in Nepal is 38.1 percent in the industrial sector, 37.3 percent in the domestic sector, 6.0 percent in the commercial sector, and 7.8 percent for export. Annual consumption by poor people in rural settings (metered below 5 amperes) is 20 kWh per capita, and consumption by semi-urban/urban households (metered from 5 to 60 amperes) is 680 kWh.

Electricity prices in Nepal are determined based on the number of units used (1 unit = 1 kWh). On average, the electricity tariff in Nepal (for 20–250 units used) is 5.65 per kWh. The tariff per kWh for up to 20 units is NR²³ 4 (US\$

21. Centre for Microfinance (CMF), Bhatbhateni, Kathmandu, Nepal, <http://www.cmfnepal.org/mf-nepalp.htm>

22. Government of Nepal, Ministry of Finance, "Economic Survey, Fiscal Year 2005/2006."

23. Exchange rate = 1 USD = 71.088 NR

0.06), for 21–250 units is NR 7.30 (US\$ 0.10), and over 250 units is NR 9.90 (US\$ 0.14). Further, the government applied bulk rate for rural electrification is NR 3.5 per kWh.²⁴

Currently about 40 percent of Nepal's total population has access to electricity: 33 percent from the national grid and 7 percent from off-grid systems. With no significant deposits of fossil fuel, Nepal relies heavily on traditional energy sources. Less than 3 percent of Nepal's rural population has access to electricity. The electricity grid is not expected to reach many of the remote areas in the next 30 years because of the difficult terrain in the Himalayas, long distances, and low population densities. For the remote areas, the Nepal Electricity Authority (NEA) frequently uses diesel power stations. Currently NEA has an estimated 55,000 kW from diesel power stations in regular use. Current prospects for extending rural electrification using existing overburdened power sources are not encouraging.

Lighting generally comes from kerosene lamps, and accounts for around 1 percent of rural energy consumption. Kerosene is a significant expense for rural households, costing 10–20 percent of a typical family's earnings.

4.1.5 Renewable Energy Implementation and Facilitators

Renewable energy electricity systems—solar photovoltaic or micro hydro—have provided modest but useful amounts of electricity to rural villagers. For cooking, thanks to the extensive national program administered by the Alternative Energy Promotion Centre (AEPCC) and implemented by the Biogas Sector Partnership Nepal (BSP), biogas plants are becoming more popular.

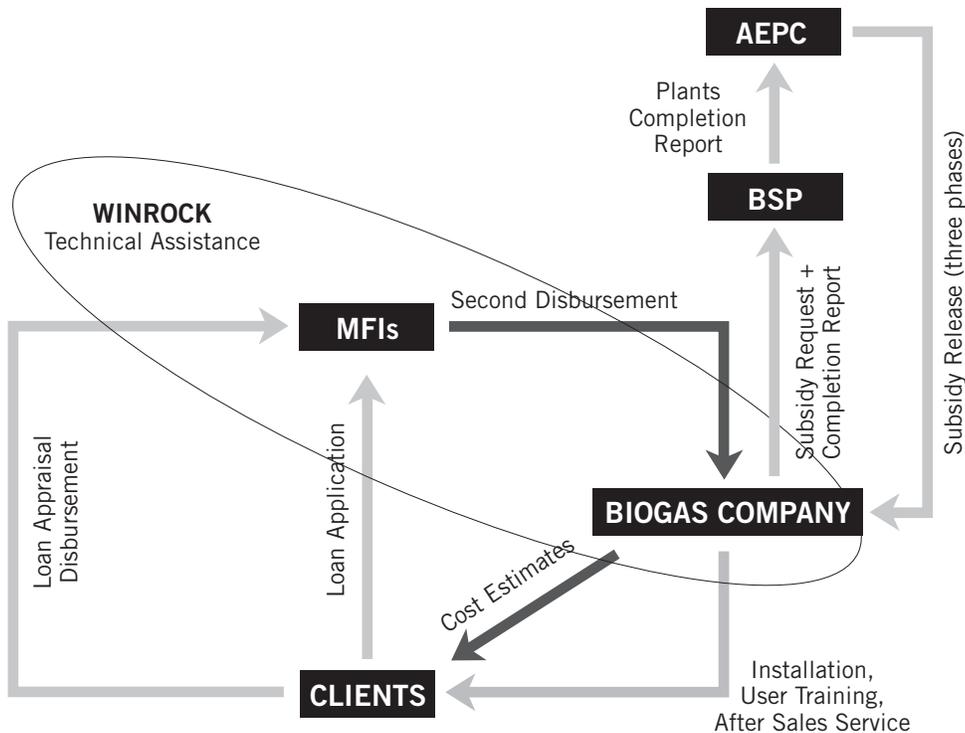
The government of Nepal established the AEPCC in 1996 to promote renewable energy technologies, support policy, administer subsidies, and conduct research. AEPCC supports for biogas include (1) a price subsidy of NR 5,000–11,500 (US\$ 69–159) per plant depending on the size and location, which is channeled through biogas companies approved by BSP; (2) biogas loan funds (EUR 2.5 million) for MFIs at 6 percent per annum for two years (without collateral) or three years (with collateral); and (3) an additional subsidy for poor consumers.

BSP is an executing agency for AEPCC and provides technical support and quality control for biogas implementation. BSP activities include vendor qualification, technology certification, capacity building, research, marketing and promotion, quality control, and endorsement of requests for subsidies from biogas companies. At present, 60 biogas companies have been strengthened and 15 biogas manufacturing companies have been established. The primary elements fostering the growth of biogas sector players are the technical support and quality control by BSP, availability of price subsidies from the government channeled via AEPCC, and availability of credit for biogas plants from more than 118 MFIs. The government's promotion of biogas plants is funded in the state budget and by various grants (Kreditanstalt für Wiederaufbau, Germany; and DGIS/SNV, the Netherlands). The relationship between the facilitating agencies is presented in the form of a flow chart in Figure 4.1.

NRB has recently classified renewable energy technology for lending to the unserved sector. This will enable commercial banks to channel their funds into expanding energy access as their 3-percent lending commitment. NRB has also increased the microcredit limit per household from US \$425 to \$715. Winrock International, supported by USAID and other donors, provides instrumental support for mainstreaming energy financing by MFIs. Winrock helps build the capacity of MFIs and facilitates linkages between energy companies and financial institutions. As a result of the enabling environment (financial incentives and technical assistance) instituted by the government (with support of foreign aid), Nepal's energy suppliers are growing stronger and improving technical and service standards.

24. Nepal Electricity Authority, <http://www.nea.org.np>.

Figure 4.1 Intervention Model by Sector Facilitators



Source: Field visits during research

4.2 ORGANIZATIONAL PROFILE

4.2.1 Structure and Operation

Nirdhan Utthan Bank Limited (NUBL) envisions itself as a bank with a social mission of enabling the poor to contribute equally in a prosperous, self-reliant rural society through self-employment and social awareness, and helping reduce poverty in Nepal. NUBL defines its target market as poor entrepreneurs, particularly women, in unserved areas of Nepal. NUBL focuses on the bottom 40 percent of the population in Nepal.

NUBL is registered under the Development Bank Act (1996) and has been in operation since November 1998, although its parent NGO, Nirdhan, began microfinance operations in March 1993. NUBL follows a Grameen Bank methodology and is directly regulated by NRB. It has authority to operate in 10 of 75 districts, and as of 30 September 2006, had 4 area offices, 43 branch offices, and a client base of 75,874 serviced by 2,527 centers.

The functional responsibilities at the head office have been decentralized into separate departments. Field operations are conducted through branch offices. Area offices are responsible for monitoring branch offices. As of September 2006, NUBL had a total of 276 staff. NUBL has reasonably sound management and adequate financial systems for its program. Although the institutional aspects discussed below are not specific to energy lending, NUBL's overall management capacity is a strong predictor of the future performance of its energy lending program.

NUBL has an authorized share capital of NR 50 million (US\$ 690,169) and a paid-up share capital of NR 27.4 million (US\$ 378,212) as of 30 June 2006. All members of its board of directors are prominent officials from banking or development fields. The chairman of the board, a former vice chairman of the National Planning Commission, represents private investors.

Accounting and Management Information System (MIS): NUBL's Oracle MIS software has five modules (finance, inventory control, human resource, payroll, and a client data monitoring system). All branches are computerized, and data is transferred from the branches to the head office every week. The software at the branches generates financial statements. The MIS can generate reports on staff performance and efficiency; overdue payments; ageing analysis; and member, center, staff, and product portfolio analyses, etc. The head office also runs detailed branch profitability and sustainability analyses.

Portfolio management: The management has faced problems in maintaining portfolio quality, partially due to the uncertain external environment (Maoist conflict) and partially due to NUBL's own internal weaknesses. NUBL had a faulty incentive policy in the past that weakened the focus on client selection and loan appraisal, leading to deterioration of portfolio quality. The incentive policy was revised in July 2006 to include quality indicators. As of 30 June 2006, NUBL's PAR greater than 60 days was 10 percent. Its new but small energy portfolio had a 100-percent repayment rate.

Business planning and financial management: NUBL's financial planning capacity is reasonable and quite participative. The head office, branches, and area offices finalize the financial plan in line with the bank's overall vision. At the suggestion of Winrock Nepal, NUBL set a conservative target of 204 biogas loans by 15 July 2007. It is still somewhat unsure of the potential of biogas loans and has decided to go slow with biogas disbursements. Cash planning is done at both the head office and the area offices. NUBL has also introduced a system of budgetary control whereby the expenses of the branches are linked to their respective incomes. Each branch is treated as a profit center.

Internal audit: The internal audit department has a team of four staff members. In addition to surprise audits, the team audits older branches twice a year and new branches once a year. The audit department is understaffed for the current scale of operation, so audit frequency is inadequate at present. NUBL has had several cases of fraud in the past. To minimize such instances, it introduced control measures, such as rotating field officers through its field centers every year, and enforcing compulsory home leave of 10 days per year for branch staff.

4.2.2 Funding Sources

NUBL's funding sources are shareholder's equity, client savings, borrowings, and grants. It borrows from commercial banks, microfinance apex institution (RMDC), and NRB at a commercial interest rate as the primary sources for funding operations.

4.3 ENERGY LOAN PORTFOLIO

4.3.1 Model and Methodology

NUBL mostly follows Grameen methodology. In principle, as an MFI, NUBL prefers to provide loans for income generation. However, it offers several loan products for other purposes—housing, education, emergencies, etc.—although these are only available to existing clients who have demonstrated several cycles of good credit discipline and repayment capacity. Financial transactions are conducted through “centers” comprised of 6–8 groups with five members each. The loans disbursed through centers do not require physical collateral, whereas individual loans, such as microenterprise loans, are provided only if the client can produce physical collateral. The energy loans disbursed so far have been through the centers with two-year terms and no collateral requirement. As of now, NUBL's energy program only offers loans for biogas plant installations.

Table 4.1 Differences between NUBL's Non-Energy and Energy Loans

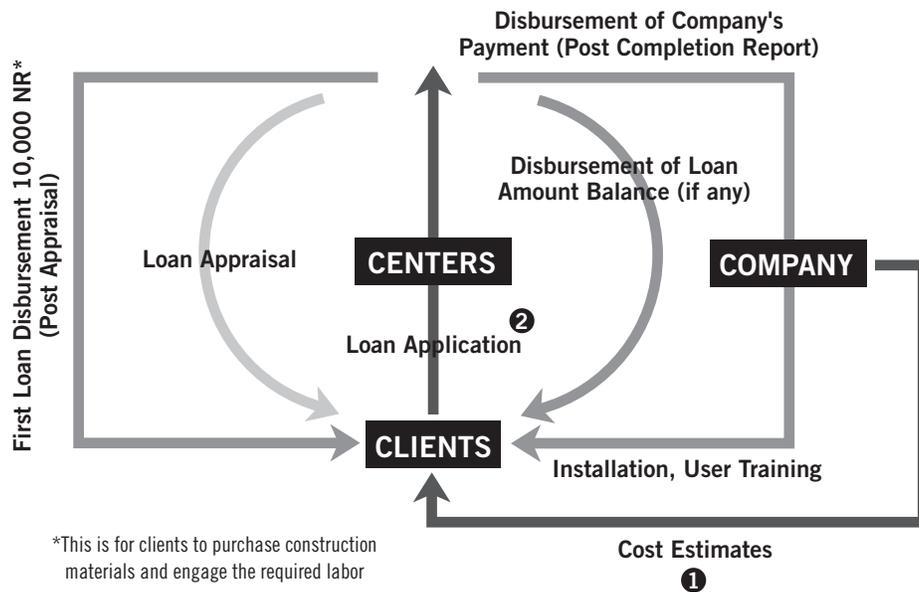
PARAMETERS	NON-ENERGY LOAN	ENERGY LOAN
	Income and non-income generating loans	Biogas loan
Loan period	0.5–6 years	Up to 2 years (without collateral) and 2–5 years (with collateral)
Interest rate	18–20% declining p.a.	16% declining p.a.
Grace period	One month	Up to 3 months
Loan size	First loan (general loan): Maximum NR 15,000 (US\$ 207) Up to NR 40,000 (without collateral, US\$ 552) NR 40,000–100,000 (with collateral, US\$ 552–1,380)	NR 15,000 (US\$ 207)
Equity requirement	Not required	Minimum 20% (cash or in-kind)
Other features	Can have two parallel non-energy loan products	Biogas loan is the only exception that can be taken as a third parallel loan
Appraisal	Field officer, sample verification by branch manager	Cost estimates/price quotation by biogas company, loan appraisal by field officer, complete verification by branch manager
Approval	Up to NR 15,000 (US\$ 207) by branch manager NR 15,000 to 40,000 (US\$ 207–552) by area manager Above NR 40,000 (US\$ 552) by head office	Branch manager
Disbursement	To client	First phase: Client Second phase: Biogas company
Collection	By field officer in center meeting	By field officer in center meeting

The interest on an energy loan is lower than any other NUBL loan product. NUBL allows parallel loans, which means that clients can have two different loans at the same time, as long as the total outstanding loan does not exceed NR 40,000 (US\$ 552). It is worth noting that although clients cannot take out a third non-energy loan, they can obtain an energy loan as a third parallel loan, in which case the maximum outstanding loan amount rises to NR 55,000 (US\$ 759).

The biogas loan at NUBL is considered a non-income generating loan for two reasons. One, implementation of NUBL's biogas loan is channeled through the national biogas program, which promotes domestic-scale biogas plants. Two, the program aims to substitute the biogas plant for firewood, kerosene, and LPG as the baseline energy source for cooking, which is not an income-generating activity. NUBL provides energy access only to clients who have successfully repaid at least two general loans. Although there is no difference in the amount of an initial general loan and a biogas loan (NR 15,000 [US\$ 207])—implying no additional credit risk—this policy was adopted to ensure that energy loans (consumption loans) are only available to clients with good credit histories. The other prerequisites for energy loans include presence of adequate land and cattle and construction of the plant.

Differences observed in the energy loan appraisal mechanism demonstrate the need for standardizing loan procedures. The other main difference lies in the disbursement mechanism. A biogas loan is released in two installments. The first installment of around NR 10,000 (US\$ 138) is paid to the client to purchase equipment, materials, labor, etc. After successful completion of construction, the balance of NR 5,000 (US\$ 69) is disbursed to the company, but only after the client signs a plant completion report at the branch office.

Figure 4.2 Process of a NUBL Biogas Loan



Should actual expenses by the biogas company be less than NR 5,000 (US\$ 69), the balance is paid to the client. The client repays the loan to NUBL in center meetings either on a weekly or fortnightly basis.

4.3.2 Relationship of NUBL, Biogas Companies, and Clients

Nepal has more than 60 registered biogas companies handling biogas plant installation, and at the time of field research, NUBL was working with 12 of them. Currently, NUBL provides price quotations from the different companies to the client, appraises the loan request, provides credit to clients, and disseminates information to clients in center meetings. It has made an effort to establish and improve co-ordination with the biogas companies. They, on the other hand, assess the feasibility of installing the biogas plant at the client's house, provide cost estimates, construct the biogas plant, train the client on the operation and maintenance of the plant (a day of formal training with brief descriptions of biogas plant, maintenance, repairs, etc.), and provide after-sale service. There is a three-year warranty with free service; after that the vendor charges for the cost of equipment/appliance replaced. The companies also provide a detailed user manual to the client with their contact details.

As of now, NUBL has not signed any MOUs with the biogas companies to define the roles and responsibilities of each party. Neither NUBL nor the companies understand each other's operation and overlook the potential of collaborating to provide energy access to the rural poor.

4.3.3 Characteristics

Thus far, NUBL provides energy loans only for biogas plants, a proven technology with easy installation, operation, and maintenance. In general, the profile of biogas plants financed by NUBL follows the standards established by BSP, both in terms of product quality as well as service quality (user training and after-sale service). The typical size or capacity of biogas plants implemented in Nepal for domestic use is 4 m³, 6 m³, 8 m³, and 10 m³.

Subsidy: To promote nationwide utilization of biogas in Nepal, the government (through AEPC) provides a price subsidy of NR 5,000–11,500 (US\$ 69–159) per plant, depending on the size and location. The subsidy constitutes 25–45 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 poor households (also targeted by MFIs), to offset their general inability to afford biogas plants. Even with this additional subsidy, poor households

still pay 25–40 percent of the cost of a biogas plant. The price subsidies are channeled by AEPC through biogas companies approved by BSP. Biogas companies certified with “good grades” are entitled to a 25-percent advance of the subsidy, with the remainder paid upon completion of installation and user training. Some of the subsidy, NR 600 (US\$ 8), is held back to ensure that mandatory after-sale service visits are carried out for two years (at least one visit per year).

Pricing and cost structure: As shown in Table 4.2, price quotations are based on plant capacity and geographical location in Nepal, e.g., terai (low land), hill, and remote hill. The subsidy amounts in the table apply to all households. For the most poor, the additional subsidy drops the price to 25–40 percent of market price.

Table 4.2 Cost, Subsidy, and Labor Cost for Biogas Plants and Credit Needed

PLANT LOCATION	4 m ³			6 m ³			8 m ³			10 m ³		
	Terai	Hill	Remote hill	Terai	Hill	Remote hill	Terai	Hill	Remote hill	Terai	Hill	Remote hill
Total cost	272	301	347	308	340	390	378	416	479	417	457	528
Subsidy	77	120	162	77	120	162	70	113	155	70	113	155
Labor contribution	21	21	21	28	28	28	32	32	32	35	35	35
Loan amount needed (Total cost minus subsidy and labor, in NR)	174	161	164	203	192	200	275	270	292	311	309	337

Source: Nepal Biogas Promotion Group.

Client profile: At the time of the field visit, NUBL had no statistics from which to analyze the income profile, amount, and patterns of their biogas loan clients. The 15 clients interviewed during the field visit were mostly dairy or vegetable farmers. Their income patterns varied from daily to monthly to seasonal, and their average income range was NR 2,500–12,000 (US\$ 34–166) per month. Indeed, typical clients for biogas loans are farmers with cattle, mostly living in lowland areas of Nepal (where most of the population farms), with some small businesses (groceries, salons, etc.).

During the field visit, it was obvious that energy for cooking and lighting is the highest priority for NUBL clients. In Nepal, biogas is used mainly for cooking (80 percent) and lighting (20 percent),²⁵ so its adoption mostly relates to women, who make up the majority of NUBL energy clients. Baseline energy expenditure is NR 150–1,000 (US\$ 2–14) per month for kerosene, fuelwood, and LPG. In general, clients seemed satisfied with the performance of their biogas plants.

Market potential: BSP estimates that the potential market for domestic biogas plants can be 1.9 million-plus, but thus far only about 160,000 units have been installed. Further, with more than 75,000 clients, 50 percent of whom have taken cattle loans, NUBL has a large client base for expanding biogas lending.

Maturity of the supply side: Any MFI in Nepal offering biogas loans benefits from the strong government control of biogas companies, whose certification and grading by BSP set high standards for quality of products and services. Company certification and grading is based on after-sale service, number of plants installed, few-to-no penalizations, no defects, etc. Only accredited biogas companies can channel the biogas subsidy. Currently the 60 biogas companies approved under BSP have more than 200 sales and services points across Nepal.

25. Other uses of biogas in Nepal include refrigeration, engine operation, and electricity generation. The by-product of biogas plants is called “slurry” and is valued as a superior fertilizer. The fertilizer is safe for crop and vegetable production as well as feed for fish.

4.3.4 Energy Service Companies

To date, NUBL has collaborated with 12 of the 60 BSP-approved biogas companies which construct, market, install, and provide guarantees for the biodigesters. These companies include Triveni Biogas Company Ltd., Neelkamal Biogas Company Ltd., Rastriya Biogas and Construction Service Ltd., and Biogas and Energy Development Company Ltd. However, because of the strong BSP-quality control compliance by these companies, NUBL has not signed specific MOUs to manage the performance of these companies.

4.3.5 Administration and Management

As of now, NUBL does not have a separate energy division or separate staff to manage its energy lending. Energy lending is administered by the planning and monitoring department of NUBL, and is treated like any other loan product it offers. Since the number of energy loans is still small (i.e., only 65 clients), it does not have separate accounting and MIS. However, the current software is able to analyze the portfolio quality and loan details of just the energy loans.

Some of the measures introduced specifically for the energy program include obtaining cost estimates from each company for plant construction and having the client certify that plant installation is made (without which payment is not released to the company).

All NUBL branch staff members, including 125 loan officers, have attended training on biogas technology and biogas loans jointly organized by NUBL and Winrock.

4.3.6 Financial Analysis

The energy portfolio of NUBL was very small at the time of the field visit, comprising only 65 biogas loans with a total disbursed value of NR 975,000 (US\$ 13,458) and 100-percent repayment. Moreover, NUBL's policy of giving energy loans only to clients with two successful general loans (non-energy) has ensured a good repayment record.

4.3.7 Impact Analysis

The energy clients of MFIs have demonstrated that poor households can afford biogas plants at the subsidized prices and benefit from them. All clients interviewed during the field research expressed their satisfaction and have benefited in a number of ways. Biogas users claimed they save between NR 150–1,000 (US\$ 2–14) per month on energy costs (kerosene, fuelwood, and LPG), medicines (eye-drops and hand lotions), and soap for cleaning utensils.

Use of biogas plants helps reduce drudgery, especially for those whose baseline energy source for cooking is fuelwood. Clients felt that use of biogas reduced the time required to collect fuelwood, cook, and clean utensils and kitchen, benefiting them directly. The time saved is being utilized for income-generating activities, child caring, socializing, and resting.

Using biogas helps create a smoke-free indoor environment, which traditionally has inflicted most rural women and children with eye, respiratory, and skin problems (from indoor fires). Since most of the biogas plants have also been connected to the toilet, it has helped improve sanitation.

The slurry that emerges at the end of the biogas process is a high-nutrient organic fertilizer which surpasses farmyard fertilizer and replaces need for chemical fertilizers (saving money). The slurry gives higher yields and can increase crop production, thereby augmenting income. Although the women could not provide any monetary estimates, they claimed that the production had improved with the use of slurry in the field.

4.4 DISCUSSION—NUBL

4.4.1 Highlights and Challenges of NUBL's Energy Lending Model

Highlights

- *The biggest strength of NUBL's energy lending model is the presence of all key energy players*—BSP, AEPC, Winrock, and biogas companies. They perform their vital roles well, and with the support from the Nepal government, serve as the main pillars for expanding energy access through biogas.
- The *biogas technology adopted in Nepal is simple, proven, and locally manufactured*. Unlike in other countries, this makes the job of MFIs in Nepal easier because the technical risk involved in financing biogas is very low.
- With *its highly-regarded reputation in Nepal* for sourcing wholesale funds and its large client base of over 75,000 clients in 2,500 centers across 10 districts, NUBL can easily bridge the credit gap to meet the energy needs of its clients with its financing scheme for biogas plants. Since 50 percent of its loan portfolio is for livestock purchases, NUBL has a broad existing base for its energy lending.
- *AEPC subsidizes the installation of biogas plants*. This brings down the effective cost of installation for the client and has been instrumental in establishing biogas plants across the country on a wide scale.
- *NUBL has a strong competitive edge*, compared to Agricultural Development Bank Limited (ADBL) and regional Grameen Banks, because its biogas loans are non-collateralized, have a two-year term, and are processed quickly. Although ADBL charges a lower interest rate than NUBL, interviews with clients and overall discussions revealed that clients were more sensitive to other loan features (amount of loan, ease of access, and collateral requirement) than to the interest rate.
- *NUBL has a favorable loan policy that permits a biogas loan as a parallel loan to two other loans*. This facility enables potential clients without sufficient biogas feedstock to obtain cattle loans or sanitation loans to complement the biogas loan.

Table 4.3 Comparison of Biogas Loans by Various Financing Institutions

LOAN SIZE	MAXIMUM 15,000	MAXIMUM 20,000	MAXIMUM 20,000	MAXIMUM 22,000
Interest Rate	16%	11%	15% + 1% upfront charge	15%
Loan Period	2–5 years	5 years	2–2.5 years	18 months
Target Clients	2-yrs old member	not limited	member & non	member
Repayment Period	weekly & fortnightly	quarterly	monthly	quarterly (with monthly option)
Parallel Loans Policy	biogas loan + addt'l loan of 40K	yes, upon availability of sufficient collateral	parallel loan to HH under diff name	not applicable
Collateral Requirement	apply for over 2 yrs loan term (accounted 50%)	collateral	collateral (accounted 40%)	no collateral
# Installed Plants	65	over 110,000 plants	data not available	data not available

Challenges

- Agricultural Development Bank Ltd. (ADBL) is the leading finance institution offering biogas loans in Nepal. However, due to political conflict (Maoist movement), it was forced to pull its operations out of

rural areas and restrict itself to districts. Although it still offers financing in rural areas, *ADB’s flow of credit in rural areas has been reduced*. MFIs such as NUBL are filling the gap by financing biogas plants to expand access to energy. However, based on the estimates provided by BSP, there still exists a huge gap between the demand and supply of biogas installations in Nepal.

- Even with a conducive environment for biogas lending, a reasonable client base, and clear benefits that biogas provides to clients, *overall disbursement by NUBL for biogas energy loans has been very slow*. Discussions with various stakeholders during the field research indicated various gaps and weaknesses in the current energy landscape that have resulted in this slow growth.
- *Biogas companies poorly understand microfinance operations, and MFIs are equally uninformed* about the demands of energy services, which have resulted in weak co-ordination and co-operation.
- For biogas loans to take off, *the energy market players need to invest in marketing and client education*. NUBL feels this is the responsibility of biogas companies and that it deviates from its core business of financing. The biogas companies, on the other hand, feel that it is a service that they ought to offer to NUBL clients, and that they should invest in market education. However, neither NUBL nor biogas companies has dedicated budget or staff resources to promote biogas loans or market education.
- Biogas companies have worked with ADBL for a long time, and their staff has become accustomed to targeting individual clients. NUBL has centers—where on average 30 members meet every week at a predefined date, time, and place—but the *biogas companies have not made use of NUBL’s network of centers*. As marketing channels, the centers could reduce time and cost of marketing and generate more business. A general lack of skills, confidence, and resistance to change seems to be a hindrance.
- Client feedback during the field research revealed that *clients thought the loan ceiling for NUBL biogas loans was too low* (NR 15,000 [US\$ 207]), compared to other finance institutions, and should be raised. In addition, clients felt that the minimum two-year membership criteria should be removed. Since NUBL provides credit only to clients with proven creditworthiness, new clients must wait for a long time before they can access biogas loans, despite their repayment capacity.
- Perhaps because the biogas loan is new, *NUBL’s lending processes were not standardized* in the two branches visited. Standardization of processes will help NUBL scale up.

Table 4.4 Stakeholders’ Perceptions of NUBL Energy Loan

PARAMETERS	PERCEPTIONS		
	MFI (NUBL)	Clients	Company
Client eligibility	2-year membership	New clients should be eligible based on repayment capacity	MFI should finance members and non-members
Loan size	Adequate	Should be raised to NR 20,000 (US\$ 276)	Should be raised to NR 20,000 (US\$ 276)
Interest rate	Lower than other products	Not an issue	Too high
Loan period	Acceptable	Only a few clients interviewed preferred a 3-year term (non-collateralized); most were satisfied with 2-year term	Want longer term of up to 5 years without collateral
Repayment period	Acceptable	Acceptable	Should be monthly instead of weekly

4.4.2 Obstacles and Barriers

- ***NUBL and the biogas companies have different perceptions of client needs, which prevent them from co-ordinating and co-operating with each other.*** Biogas companies need to understand microfinance operations and the legal limitations under which MFIs operate. MFIs have high operational costs and cannot offer loans at the interest rates expected by the biogas companies. Clients did not find interest rate charged by NUBL to be too high because the alternative sources of credit (informal sources, such as moneylenders, etc.) available to them are usually much more expensive. For clients, adequate and timely availability of credit and convenience is more important than the interest rate. Other beliefs held by the biogas companies, such as a need for a five-year loan term and monthly loan repayment, were also found to be baseless. With support from Winrock, NUBL has approached biogas companies several times (invited them to center meetings, organized workshops with senior management, etc.), but their efforts have not been successful so far. The perception by biogas companies that microfinance is not suitable for rural clients poses a significant barrier for NUBL.
- ***NUBL is not completely certain of the potential of energy lending or the sustainability of its biogas loan product,***²⁶ and it lacks technical understanding of the energy sector, although its existing energy product has been growing well. On the other hand, most biogas companies at their present scale of operation seemed to be getting business either through cash payments or a finance facility (such as ADBL), lack vision to expand into the untapped market, feel microfinance is too expensive and not well designed well for rural clients, and wonder why MFIs like NUBL do not lend to non-members.
- ***Biogas companies in Nepal have weak market infrastructure.*** The companies sell door-to-door and at times hire agents to attract new clients. However, none of these companies has any budget detailed for promotion and marketing, and they feel more comfortable with traditional marketing practices.
- Channeling wholesale funds is not a barrier for NUBL, which has its own funds for energy lending, but it should be noted that ***many MFIs financing biogas in Nepal cannot rely on timely availability of wholesale funds.*** Almost two-thirds of AEPC's funds are lying idle because its procedures for selecting, approving, and disbursing funds to MFIs are lengthy, and then funds are often delayed, which discourages MFIs from borrowing from AEPC.

4.4.3 Key Lessons Learned

Favorable government policy environment. Nepal has huge biogas potential that is still untapped and the government is clearly inclined to promote biogas in rural areas, making the overall policy environment favorable. The presence of BSP reduces the technical risks and transaction costs for institutions financing biogas in Nepal. Biogas subsidies are linked to quality that ensures that the benefit trickles down to the client and that funds are used efficiently. Biogas technology is also simple, proven, and mostly manufactured locally, which helps make expansion easy.

Necessity of co-ordination between stakeholders. Despite a favorable policy environment, an energy-lending model may not take off if there is little co-ordination between different stakeholders, such as the case with NUBL and Nepal's biogas companies. This clearly reflects the need to build both capacity and awareness among energy and microfinance actors about each other's operations and the potential benefits of partnership.

26. Interestingly, two contrasting views on energy loans were heard from the two NUBL branches visited. Staff of one branch felt that biogas loans were an additional burden because they required technical knowledge and needed promotion and marketing. The second branch felt that biogas loans had good potential and were much easier to make than animal husbandry loans, (e.g., risk of cattle dying, etc.), because the risk was lower, thanks to the strong quality control enforced by BSP.

Market and client education. Not educating the target market can thwart attempts to scale up energy lending. Market education requires a huge investment and cannot be accomplished without participation by all stakeholders. There needs to be mutual understanding and clear demarcation of roles and responsibilities between the companies and MFIs. Educating clients is a win-win situation for all: MFIs can provide a value-added service to their clients as part of their core business, energy companies can reach lower economic segments that are still untapped, and the government can deliver alternative energy solutions to rural households to fulfill its mandate.

Efficient delivery of wholesale funds. It is important to have wholesale funds in place and an efficient system to channel those funds to MFIs to expand energy access. Although AEPC has funds, they are not being disbursed due to bureaucratic procedures that cause sub-optimal utilization. Even funds for unserved sector lending are not available to all MFIs because the commercial banks are not comfortable lending to most MFIs, thus reducing the scope of financing alternative energy solutions on a wide scale.

4.4.4 Opportunities for Country Scale-Up and Regional Replication

Enhance stakeholder co-ordination through trainings, interactive workshops, and meetings between MFIs and biogas companies involving different levels of staff: The past workshops and meetings held between NUBL and biogas companies were not enough to build effective awareness and coordination because the meetings were limited to senior management and did not involve operational and field staff. Technical support provided by BSP and Winrock can be used for this purpose. Donor support for capacity building would be very useful to various stakeholders.

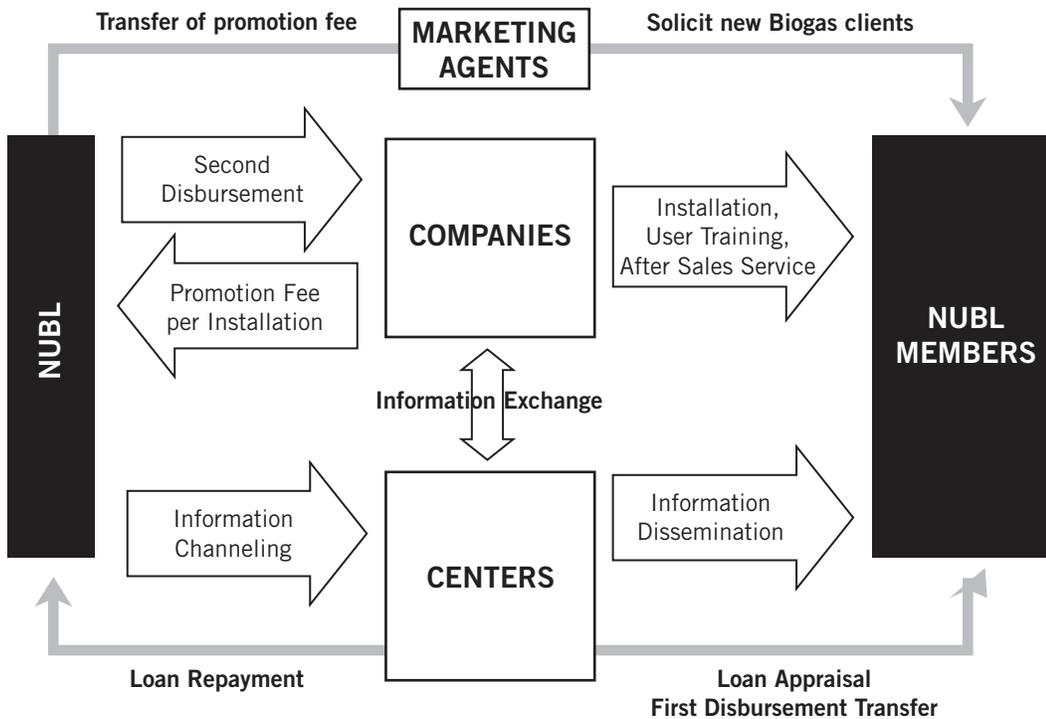
Develop a mechanism for client education through joint initiatives between MFIs and biogas companies. Biogas companies should piggyback on the existing infrastructure of MFIs, such as NUBL, to reduce their transaction costs and expand business. By using NUBL centers, biogas companies can reach more clients in less time, and NUBL can disseminate information about their energy loan product and biogas companies at center meetings. Inviting new clients to visit existing biogas clients can be an effective promotional tool.

Designate a separate department or staff in the head office to oversee the expansion of biogas loans. This should be considered by NUBL and other MFIs. Moreover, instead of field officers assuming full responsibility for promoting and marketing biogas loans, agents can be hired (as is sometimes done by biogas companies) on commission to promote the product. The agent would get the commission only when the loan is approved and disbursed by the MFI. The agent's commission can either be paid by the company or jointly by NUBL and company. The cost of commission can be built in the interest rate structure of biogas loan.

Design a scalable product or add it to an existing product. When client feedback revealed that the amount and timely availability of credit was more important than a lower interest rate, NUBL should consider charging an interest rate at par with the other credit products to build in the initial expansion, promotion, and marketing costs. NUBL should also reconsider its two-year eligibility condition that has restricted new members from accessing the loan. Similarly, since all stakeholders felt that the loan limit of NR 15,000 (US\$ 207) was too low and should be increased to NR 20,000 (US\$ 276), NUBL needs to revisit its product design and even conduct an in-house survey to make its product more scalable.

Develop an innovative financing mechanism. It is clear that biogas loan clients require loans with terms of at least two to three years. However, the funds usually available to MFIs from commercial sources are on a one-year basis. This mismatch of asset liability is a problem unless the MFI can mobilize funds for longer terms. Therefore, provision of wholesale funds must be in line with the energy loan product design, or some other innovative financing mechanisms should be put in place, such as pre-financing longer-term loans (Figure 4.4), providing credit guarantees, and employing loan loss reserve funds, etc., to make the energy lending more attractive and feasible for MFIs. Although AEPC funds have been designed with the biogas loan product in mind and have a two-to-three-year repayment period, inefficient disbursement procedures have kept MFIs from taking advantage of these funds.

Figure 4.3 Proposed Scale-Up Model of a NUBL Energy Loan



Pursue product and market innovation. Since biogas plants are appropriate only for farming populations, NUBL need to explore other renewable energy technologies for the urban and peri-urban clients in its 75,000-plus client base. It should also consider different market segments based on the existing businesses and enterprises of its loan clients—beyond households and consumption—to further scale up its energy lending program. Financing energy options for productive use and income-generating activities (solar driers, biomass generation to operate machinery) and other energy enterprises (battery-charging stations, electricity service enterprises) is an obvious next step. Due to the lack of technical knowledge about renewable energy, external support from the government (AEPC), donor institutions, and NGOs (i.e., Winrock) is crucial.

Importance of national-scale support. BSP has played a remarkable role in accelerating the utilization of biogas systems for domestic purposes in Nepal. BSP has helped the country create strong market players and helped financing institution minimize the potential technical risks associated with the performance of the biogas company. BSP-like support is needed for replication in other countries if the energy industry is not mature, the number and quality of reliable energy suppliers are limited, and the financing institutions lack technical knowledge to develop strategies to mitigate technical risks.

CHAPTER 5 • AMRET—CAMBODIA

5.1 CAMBODIA COUNTRY CONTEXT

5.1.1 Socio-economic Environment

Cambodia's social and economic infrastructure has suffered severely through long years of invasions and war. The process of restoring peace began in 1991, but relatively peaceful elections were not possible until July 2003. Economic reforms in Cambodia started in 1999, and from 2001 to 2004, the economy grew at an average rate of 6.4 percent, driven largely by an expansion in the garment sector and tourism. However, long-term development of the economy remains a daunting challenge. The population lacks education and productive skills, particularly in the poverty-ridden countryside, which suffers from an almost total lack of basic infrastructure. About 74 percent of the population remains fully engaged in subsistence farming, yet the contribution of agriculture to GDP is only 35 percent. Today, Cambodia is one of the poorest countries in the region: 36 percent of its 13.8 million citizens live below the national poverty line. Furthermore, a weak social infrastructure—as evident by Cambodia's rank of 130 of 175 in the UNDP 2003 Human Development Index—means that gender inequality, rural-urban regional disparities, and poor health facilities continue to be significant hindrances to development.

5.1.2 Banking Sector Overview and Key Financial Indicators

The financial and banking sector was destroyed by the Khmer Rouge, which abolished money for a number of years. In the 1990s, Cambodia's banking sector went from a single public bank to a two-tiered public banking system that separated the functions of the Central Bank from the commercial banks. The Royal Government of Cambodia introduced banking regulations in 1999 and a bank-restructuring program in 2000, which liquidated a number of non-viable banks. Today, 17 banks remain in operation: 1 state-owned bank, 3 foreign bank branches, 10 local banks, and 3 specialized banks (one of which is state-owned). The government has liberalized interest rates, established reserve requirements, capped the total exposure allowed to any one individual or client, and capped bank positions in foreign currency as a percent of the bank's net worth.

The total assets of banking sector almost doubled from 2001 (KHR 2.9 million, US\$ 723) to 2005 (KHR 5.5 million, US\$ 1,370). However, more than 52 percent of these assets are in the form of cash, loans, and deposits with the National Bank of Cambodia (NBC) and other banks, and only 30–45 percent is with non-bank customers as loans and advances. The liquidity ratio of banks was much higher, at 120 percent in 2005, than the required minimum of 50 percent by *prakas*.²⁷ The banking sector has shown a strong capital adequacy in compliance with the regulation requiring a solvency ratio of 15 percent. The banks had a solvency ratio of 27 percent and equity-to-total-assets ratio of 22.3 percent in 2005. The ratio of non-performing loans to total assets peaked in 2002 at 5 percent and declined to 3 percent in 2005. The proportion of loan exposure in agriculture has remained stagnant at 2–3 percent from 2002 to 2005, despite the fact that 74 percent of the population is engaged in farming. Most loans are in the service sector (33 percent), wholesale and retail (21.5 percent), and manufacturing (10 percent), reflecting a weak exposure in rural areas. Return-on-equity (ROE) has grown rapidly from 1.7 percent in 2001 to 7.8 percent in 2005. Return-on-assets (ROA) also increased from 0.5 percent to 1.7 percent during the same period. Despite such improvements, profit-

27. A regulation issued by a minister or by the governor of the National Bank of Cambodia concerning banking or financial issues.

ability of the banks is globally weak, as ROA and ROE remain low.

Cambodia's financial sector is still at a rudimentary stage: the number of commercial banks (15) is limited and they are effectively non-existent outside the capital. With the exception of ACLEDA Bank (commercial bank), the Rural Development Bank (one of four specialized banks), and to some extent, Canadia Bank (commercial bank), formal banks do not yet serve the poor. In this context, microfinance institutions and the informal financial sector have been the de facto providers of financial services in rural areas, albeit concentrating mainly on rural credit. Currently there are at least 100 registered and unregistered lending bodies serving rural Cambodia, including 16 licensed microfinance institutions and 24 registered rural credit operators. The nine major players in the microfinance market in Cambodia serve over 95 percent of the formal sector market. One is a commercial bank and eight are MFIs licensed by NBC.

5.1.3 Financial Sector Regulation

The Royal Government of Cambodia adopted a financial sector plan for 2001–2010 in August 2001. The plan aims to develop a sound market-based financial system by promoting competition and encouraging private players to support resource mobilization and broad-based sustainable economic growth, and thus establish a framework for supervision and upgraded prudential regulation. It anticipates that the financial sector's ratio of financial assets to gross domestic product will at least double in 10 years, and that the spread between loan and deposit rates will narrow as intermediation becomes more efficient.

As part of the first phase of the financial sector plan, the government has adopted the Rural Credit Policy to develop an effective rural financial system, and has initiated the Rural Credit and Savings Project and Technical Assistance for Capacity Building for Rural Financial Services. Its policy measures include:

- introducing a provision in the banking law that enables eligible NGOs and other rural finance service providers to become regulated licensed MFIs;
- creating a microfinance supervision department within NBC to conduct off-site and on-site inspections of licensed MFIs and a specialized team to monitor the financial activities of NGOs;
- establishing the Rural Development Bank (RDB) as an apex institution to provide financing for MFIs and commercial banks and to extend technical support and training to MFIs; and
- enhancing collaboration among the government, NBC, and NGOs to promote sustainable rural finance.

Phase II of financial sector plan calls for:

- establishing a range of service institutions and organizations (legal provisions would be created to support the establishment of venture capital funds and equity funds);
- promoting innovative pilot microfinance projects; and
- introducing safety nets to reduce risks and vulnerability through insurance services.

Phase III will review, consolidate, and further strengthen all the measures undertaken to that point.

5.1.4 Microfinance Sector Regulation

The National Bank of Cambodia is responsible for regulating and supervising microfinance in Cambodia. NBC promotes rural finance by monitoring the soundness and sustainability of microfinance institutions, building up public confidence, protecting small depositors, and endorsing good governance. In terms of supervision, NBC conducts off-site and on-site inspections, monitors MFIs and the programs they implement, promotes appropriate credit policies

and procedures by MFIs, and makes recommendations. The NBC has also been delegated the authority to regulate, supervise, license, and revoke licenses of MFIs; issue prudential regulations; and strengthen supervisory capacity.

The Law on Banking and Financial Institutions (enacted November 1999), and the government decree, or prakas, for implementation (enacted in early 2000) recognizes three categories of banking institutions:

- Commercial banks, which require a minimum registered capital of US\$ 13 million, can carry out all banking activities.
- Specialized banks, which require a minimum registered capital of KHR 10 billion (US\$ 2.5 million), can carry out a limited number of banking activities, as specified in the terms of their license.
- MFIs, which are required to be incorporated as a limited liability company or as a co-operative, require a minimum registered capital of KHR 250 million (approximately US\$ 62,500).

Registration or licensing of MFIs by NBC is compulsory when operators meet one or more of the conditions in Table 5.1. In other words, NBC licenses medium-sized MFIs and registers small MFIs.

Table 5.1 National Bank of Cambodia’s Mandatory Conditions for MFIs

IF ENGAGED IN	REGISTRATION BY NBC	LICENSING BY NBC
Credit	Loan portfolio outstanding: > KHR 100 million (US\$ 25,000)	Loan portfolio outstanding: > KHR 1 billion (US\$ 250,000) or > 1,000 borrowers
Savings	Voluntary savings mobilized: > KHR 1 million (US\$ 250) or > 100 depositors	Voluntary savings mobilized: > KHR 100 million (US\$ 25,000) or > 1,000 depositors

5.2 ENERGY SECTOR OVERVIEW

5.2.1 Energy Access and Consumption

Per capita energy consumption in Cambodia (55kWh per capita, 14 percent of GDP) is one of the lowest among the developing countries and even the world. This can be partly attributed to the high price of electricity and a low per capita gross national income of US\$ 300. In 2001, it was only 14 kilogram (kg) of oil equivalent per capita (compared to the world average of 1,692 kg of oil equivalent per capita).

Cambodia has few exploitable energy sources other than biomass. Wood and other biomass account for 85.06 percent of the total national energy consumption. Its natural forests, the main source of fuel wood, have been severely depleted due to widespread logging and forestland conversion. (Fuelwood and charcoal together represent about 96.3 percent of all cooking fuel consumed in Cambodia.) Fossil fuels, mainly diesel and heavy oil, are imported for electricity production and transportation. Wood-based energy consumption is mainly in the household sector, which consumes about 79,906 TJ (terajoules). Rural households consume 74,449 TJ and urban households, 5,457 TJ.

Only 17 percent of the population has continuous access to electricity via a reliable public grid, mostly in Phnom Penh. For the rural population—83 percent of Cambodia’s total population—less than 13 percent have access to “grid-quality” power, although an increasing number have access to either private part-time mini-grids or battery-charging services. It has been estimated that there are 600–1000 rural electricity enterprises (REEs) that supply various power services in rural areas to approximately 60,000 households.²⁸

28. SME Cambodia, “Renewable Energy and Electrification study, 2003,” found on the Cambodia Renewable Energy and Rural Electrification website, “Reports and Papers,” www.recambodia.org/tpree.htm.

Table 5.2 Current Lighting Sources and Consumption in Rural Areas in Cambodia

Lead acid batteries	55%
Dry cell batteries	24%
Other (candles)	12%
REE grid	4%
Small generator	3%
EDC grid	2%

The electricity prices in Cambodia are the highest in Asia, and some of the highest in the world, due partly to the heavy use of old small generators, reliance on imported diesel fuel, and significant losses from low-quality medium-voltage distribution systems. Electricity cost is US\$ 0.14/kWh in EDC's grid (Electricité du Cambodge²⁹) and US\$ 0.30–0.92 per kWh in rural areas served by REEs.

5.2.2 Renewable Energy Implementation

Renewable energy implementations in Cambodia are still dominated by government and donor-driven projects. The retail market for renewable energy is at a premature stage compared to other countries in this report (India, Sri Lanka, and Nepal). The Ministry of Industry, Mines, and Energy (MIME) has made a firm commitment to promote renewable energy to meet the country's energy need. These renewable energy projects include solar photovoltaic systems, biomass co-generation, biodigester plants, biogasifier plants, hydropower plants, and wind power plants.

The use of photovoltaic systems in Cambodia began with a few installations donated by United Nations Children's Fund (UNICEF), the Red Cross, La Fondation Énergies pour le Monde (FONDEM), NEDO, EBARA, and other NGOs. Specific installation figures of photovoltaic are listed in Table 5.3.

Table 5.3 Photovoltaic Installations in Cambodia, 1997–2004

APPLICATIONS	CAPACITY (Wp)
Lighting	55.9
Pumping	13.3
Refrigerator	7.8
Computers	6.9
Radio repeater	1.9
Telecommunication equipment (for mobile phones)	1,050.0
Total	1,135.8

29. In 1992, Electricité du Cambodge was attached to the Ministry of Energy. After the elections in 1993, EDC was restructured under the Ministry of Industry, Mines, and Energy (MIME) and was responsible for the development, management, and operation of the power system in Phnom Penh and 6 large commercial towns. <http://www.edc.com.kh/about.html>.

Table 5.4 Profiles of Hydropower and Biomass Projects in Cambodia

HYDROPOWER PROJECT TYPE	NUMBER OF PROJECTS	TOTAL INSTALLED CAPACITY (MW)	ANNUAL GENERATING POTENTIAL (GWH/YEAR)
Installed projects			
Large (5 MW to 465 MW)	1	12.00	53.00
Mini-hydro (500 kW to 5 MW)	1	1.00	2.50
Micro-hydro (10 kW to 500 kW)	1	0.04	0.14
Identified projects			
Large (5 MW to 465 MW)	20	1,788.30	8,839.97
Mini hydro (500 kW to 5 MW)	9	23.05	108.50
Micro hydro (10 kW to 500 kW)	10	0.68	1.78
Totals	119	2	17
Installed projects by 2003			
Hybrid bioreactor and photovoltaic	1	0.07	0.56
Domestic biodigesters	112	Not applicable	0.52
Identified projects			
Biomass gasifiers (wood, rice husk)	3	0.285	1
Biomass-fired cogeneration (rice husk, cashew nut shell)	2	2	14
Landfill gas capture or flaring	1	*	*
Totals	119	2	17

The master plan for electrification argues that, given “the topography and high rainfall,” many areas of Cambodia are suitable for the development of mini-hydro schemes of 100 kW–5 MW (World Bank and HECEC, 1998). The often-quoted figure for Cambodia’s hydro power potential was provided by an ADB report, which argued that the Mekong River and its tributaries have potential to generate 8.6 GW of electricity (ADB, 1999).³⁰

An NEDO study³¹ indicated that Cambodia has the potential to generate an estimated 18,852 GWh/year from biomass. However, since biomass production is so widely dispersed and is limited by the availability of sufficient quantities of residues and their collection and transport to energy production facilities.

A pilot project for 9-kWh biomass gasification has been implemented in Anlong Tamey village, Banan District, Batambang, under the support of SME Cambodia. This facility is run by a community co-operative, and provides electricity to 70 co-operative member households. The biomass gasification system operates 100-percent on locally farmed trees.

To meet the domestic energy need for cooking and lighting (optional), the National Biodigester Program (NBP) was established in early 2006 to promote and deploy commercial biodigester technology.

30. Cambodia’s master plan, World Bank and HECEC, and ADB are cited from the Cambodia Renewable Energy and Rural Electrification website, www.recambodia.org.

31. NEDO (New Energy and Industrial Technology Development Organization), “Assistance Project for the Establishment of an Energy Master Plan for the Kingdom of Cambodia, Final Report,” (Phnom Penh, Cambodia: NEDO, 2002). See <http://www.recambodia.org/rpnedo.htm>.

5.2.3 Renewable Energy Facilitators

Rural Electrification Fund (REF). REF is an important component of the six-year-old Rural Electrification and Transmission (RE&T) Project, funded by a loan from the World Bank and a grant from GEF and ADB. REF is administered by an independent state agency with a mandate to accelerate rural electrification and reduce the cost of supplying energy and thus help reduce poverty in rural areas.

The **Ministry of Industry Mines and Energy (MIME)** understands that in order to meet the targets defined for REF, it needs a supply of credit since it is not possible for the rural population to contribute 75 percent of cost as equity. It is also aware that Cambodia's commercial banks (except ACLEDA) cannot help expand access to energy because they have no presence in rural areas. However, a lack of understanding of how MFIs operate and an assumption that MFIs charge high interest rates that are not viable for REEs has kept MIME from approaching MFIs.

National Biogas Program. In January 2006, the Ministries of Agriculture and Fisheries and SNV Netherlands Development Organisation jointly developed the National Biogas Program as a way to create an indigenous, sustainable energy source in Cambodia and utilize the potential of biogas. NBP aims to construct 17,500 biogas plants in six provinces over a period of four years. Progress toward this target has been slow because it needs the support of MFIs and has failed to attract them so far.

Renewable Energy Private Sector Association (REPSA). REPSA was formed as a private association in 2003 to represent the interests of private businesses supplying renewable energy products and services in Cambodia. REPSA meets regularly and has over 10 members who are recognised by the government and World Bank as important stakeholders in REF.

SME Cambodia. This NGO provides business development services for small and medium rural enterprises, including those in the energy sector. SME Cambodia also helped establish, and supports the operation of the Rural Electricity Enterprises Association.

5.2.4 Energy and Alternative Energy Suppliers

Since the conventional electricity source in Cambodia is battery generated (charged by diesel and light oil generators), energy suppliers in Cambodia are predominantly diesel generator and battery suppliers. Suppliers for alternative energy equipment in Cambodia are still very few and companies are immature compared to those in the other countries in this report. Alternative energy suppliers mainly provide solar photovoltaic, biogas, and biomass gasifier technology. However, most of the energy suppliers are still dependent on the government and donor-driven market. Retail markets exist, but are limited to consumers with the capacity to pay cash.

These are some of the leading alternative energy suppliers:

- **SME Renewable Energy Ltd. (SME-RE):** SME Cambodia and E+Co (a US non-profit renewable energy investment organization) jointly established this renewable energy company in Cambodia. SME-RE promotes renewable energy technologies and market biomass gasification power generation systems in Cambodia and throughout the greater Mekong region.
- **New Energy Group (NEG):** NEG is one of the suppliers working in Phnom Penh for the last three years. It has installed solar home systems, micro hydro, and gasifiers as a pilot project. They have installed 300 SHS on a retail basis.
- **Khmer Solar (KS):** KS is one of the leading solar photovoltaic suppliers in Cambodia, with a branch of office in Batambang Province.

5.3 ORGANIZATIONAL PROFILE

5.3.1 Structure and Operation

AMRET's organizational structure, policies, products, and strategy are designed in line with its mission statement and aim to provide need-based financial products to its clients while ensuring its own long-term sustainability. AMRET's primary objective is to contribute to rural development in Cambodia by providing microfinance services and help improve the living standards of the rural population. It caters to groups of five clients (called a solidarity group, or SG) plus creditworthy individuals who may or may not be members of an SG. One of the prerequisites for membership in AMRET is that the client be married and older than 18 years of age.

AMRET customers must have a permanent residence in one of its operational districts without plans to leave the district before repaying all debt owned to AMRET. Target clients for individual loans reside in the regions, villages, districts, or provincial towns, have low or middle incomes, and specifically desire to upgrade their household's economy via individual or family loans or loans for micro, small, or medium enterprises. Clients must also provide physical collateral to be eligible for loans.

AMRET is registered as a licensed MFI in Cambodia. Its microfinance program is one of the country's largest, operating mostly in rural and semi-urban areas. As of 30 June 2006, AMRET had operations in 59 districts in 13 southern and central provinces, with 30 district branch offices. It had a total of 2,622 solidarity groups clubbed together in almost 1,450 village associations (VAs). AMRET has a total client base of 113,702.

Its organizational structure has clearly defined roles and responsibilities at each level. The functional responsibilities have been decentralized in various departments at the head office. Field operations have been decentralized to district offices and provincial offices. Overall, AMRET has solid management and administrative capacity. Four institutional investors, namely GRET, SIDI, La Fayette, and I & P, hold the present equity base of AMRET. Of the total paid-up equity, GRET holds 47.4 percent.

Accounting and Management Information System (MIS): AMRET has good accounting and MIS. Although preparation of financial statements is centralized in the head office, MIS is fully decentralized. AMRET uses AccPac accounting software and has shifted to a Windows-based software, MicroBanker, called MBWin, for MIS. The software has been installed in district offices and enables AMRET to track client loan details which it could not do before.

Portfolio management: The operations department is responsible for seeing that the health of the portfolio is maintained and any delinquency is immediately taken care of. AMRET has a sturdy and well-designed process for client selection and loan appraisal. Detailed analysis of client cash flows, good tracking of loan repayments and overdue payments, strong repayment follow-up mechanism, and good credit discipline both at the staff and client levels has enabled AMRET to maintain excellent portfolio quality. The organization has PAR >30 days of only 0.1 percent and a repayment rate greater than 99 percent.

Business planning and financial management: AMRET's entire process of financial planning is quite participative. The planning exercise is done annually and it originates from the plans of the credit agents. Based on these plans, the district office prepares its plan for the year. Each of the departments in the head office undertakes a similar exercise and then the plans are consolidated. The annual plan is further broken down into monthly details with specific targets to be achieved during each period. In addition to this, the organization has also prepared a detailed five-year operational and financial budget.

The district offices do cash planning on a monthly basis. Excess cash from the district offices is deposited at the provincial office, which deposits the same in the bank.

Internal audit: AMRET has an inspection department with eight staff members, but it is clearly too understaffed to conduct an adequate number of internal audits, given the size of AMRET's operations. The audit includes policy, operational, and financial compliance checks. However, operational and financial compliance checks at the client level are done on a very small sample of 7–10 percent. The organization has dealt with several minor cases of fraud in the past. In addition to the audit department, AMRET has an audit committee at the head office comprised of a representative from the board, the general manager, and the audit manager. It meets once every six months and recommends internal audit and internal control activity.

Product development: AMRET has employed a *MicroSave* product development model since 2000. It created a product development task force team made up of representatives from all the head office departments. The marketing and communications department is responsible for conducting client satisfaction and demand surveys, assessing potential needs, and making recommendations. Specific surveys are also conducted based on indicators from MIS reports, such as a rising client drop-out rate. After the product costing, a product prototype is developed and necessary systems and documentation created to pilot test the product. If everything goes well, the product is finally launched.

5.3.2 Funding Sources

AMRET has obtained a subordinated loan of about US\$ 1 million from the Ministry of Economy and Finance. This resulted from the transfer of the project's credit fund, liabilities, and reserves, which were granted by Agence française de Développement (AfD), to AMRET in June 2000.

In addition to the subordinated loan, AMRET has borrowed loan funds in local currency (KHR) as well as US dollars from a diverse set of lenders (both national and international financial institutions). Appendix 9 shows the different sources of AMRET's outstanding loan funds, plus the grants for microfinance operations, as of September 2006.

5.4 ENERGY LOAN PORTFOLIO

5.4.1 Model and Methodology

AMRET has adopted a mix of group and individual models. It lends through solidarity groups (SG) and to individuals, which reflect its two main loan products, a "Solidarity" loan and an individual loan. Solidarity loans are offered to the members of an SG and can be used for any purpose. Individual loans, on the other hand, can be used for business, house repair, education, or consumption. Individual loans require physical collateral, unlike solidarity loans, which operate on the concept of social collateral. Individual loans can be approved at the district office or at the house of the client. However, the interest rate is higher if the loan is provided at the client's doorstep. Energy loans fall under the individual business loan product category.

AMRET does not have any specific vendor or energy company, since energy loans are only offered for the purchase of battery or diesel generators. AMRET staff is only responsible for conducting the loan appraisal (including the feasibility analysis of the enterprise and a detailed study of client cash flows) and sanctioning, disbursing, and collecting loans, as is standard for microfinance loans. The consumer repays the energy loan to AMRET based on the repayment schedule decided at the time of disbursement.

Table 5.5 Differences Between Solidarity Group Loans and Individual Loans

	SOLIDARITY GROUP LOAN (Any purpose)	INDIVIDUAL LOANS (Business, including energy loans, home improvement, education, consumption)
Target client	Individuals organized under JLG in a group of five	Creditworthy individual, SG/non-SG clients
Loan amount	Maximum KHR 600,000 (US\$ 150)	Maximum KHR 20,000,000 (US\$ 5,000)
Interest rate	42% p.a. on declining basis	36–42% p.a. declining for loan at client's house 24–36% p.a. declining for loan at AMRET office
Term	6–12 months	Up to 24 months
Installment	Flexible principal with an option of bullet payment; monthly interest	Flexible/monthly for business loans up to KHR 1,000,000; others only monthly
Collateral	Group guarantee (social collateral)	Up to 2 times the loan value (1.5 times with land and building)
Grace period	Not applicable	Maximum 6 months
Appraisal	District office	< US\$ 2,000: District office > US\$ 2,000: Provincial office
Approval	Credit committee at district level	Credit committee at district/province level
Disbursement	Field VDC (incentive 8–10%)	Field (at client's house) or district office Field by credit agent (at client's house) or district office

5.4.2 Characteristics

At the time of the field research, AMRET had made energy loans to over 707 clients, although they were managed as individual business loans. The energy loans can be used to purchase diesel generators to provide energy service through rural electricity enterprises. The majority of clients use it for their households or to enhance existing productive enterprises (e.g., making wine, powering a tobacco kiln, making ice, firing tiles and bricks, etc.) or to purchase batteries for their own use or to rent to others. Over 79 percent of AMRET energy clients are female, and 36 percent are 30–39 years old. AMRET energy clients are spread across 50 districts, with most of them concentrated in the districts of Ba Phnum, Kampong Trabaek, Me Sang, Kampong Trach, Kien Svay, Prey Nob, Svay Chrum, and Preah Sdach.

5.4.3 Service Company

AMRET has not collaborated with any energy service company so far. The clients interact directly with their service company, without any involvement of AMRET. Service companies in Cambodia are dominated by generator and battery suppliers, as those are the common electricity source for most households unserved by the electricity grid.

5.4.4 Administration and Management

AMRET does not have a separate staff or mechanism in place to administer or monitor energy loans. There is no separate accounting system for energy or business loans. However, from the MIS, the loan portfolio can be analyzed by extracting data on loan utilization, such as purchase of battery charger, etc., which makes it possible for AMRET to monitor or track its energy loan portfolio separately.

Per the financial analysis performed during the field visit, AMRET so far has no defaults in its energy loan portfolio. Repayments have been on time and reflect a strong credit culture built up by the MFI. The total energy portfolio as of 30 June 2006 was KHR 354 million (US\$ 88,213). Since energy loans are not accounted for separately, it is not possible to do a profitability analysis of the energy loan portfolio.

5.4.5 Impact Analysis

Because Cambodia's rural areas have very little electrification, the demand for batteries and grid connection from rural energy enterprises is high. AMRET's credit facility has enabled rural energy enterprises to emerge and provide energy service to the rural population who have no access to the EDC grid. It has also provided small scale producers (winemakers, icemakers) with access to an energy source that enables them to scale up production

5.5 DISCUSSION—AMRET

5.5.1 Highlights and Challenges of the AMRET Bank Energy Lending Model

Highlights

- *AMRET has a huge client base and wide geographical presence with a good rural branch network.* As of 30 June 2006, the organization had 113,702 clients in 59 districts and 30 branch and district offices. Although AMRET had only 707 clients with energy loans, the overall client base is a potential market for the energy product.
- AMRET has demonstrated a *good balance between offering flexible financing and maintaining portfolio quality.* The flexible repayment mechanism provides greater flexibility to the clients and allows them to repay loans per their own cash inflows within a defined loan term. AMRET has maintained a healthy portfolio quality due to professional systems and good credit culture.
- AMRET was the first microfinance institution to be licensed in Cambodia. It has *mobilized funds and equity from diverse sources* and enjoys a good market reputation. Its excellent credit record and highly transparent operations make AMRET an attractive institution for donors or lenders willing to fund it.
- AMRET has a *sturdy MIS system in place.* It installed new software (to overcome the weaknesses of its previous software), which enabled AMRET to improve its loan tracking system. In addition, the in-house IT department has enabled AMRET to generate reports with aggregation per administrative hierarchy (village>commune>district>province) as well as AMRET's own hierarchy (group>village association>credit agent>district).
- Unlike many other MFIs, *AMRET has a separate department for marketing and communications,* which is responsible for conducting in-house research, including impact assessment. It also develops new products using internationally acknowledged best practices and promotes existing products. AMRET has a well-defined process for research and development. The organization also has a separate budget for promotional activities.

Challenges

- Unlike SEWA Bank and SEEDS, which are highly conversant with various energy alternatives, *AMRET has limited knowledge of energy sector.* AMRET has not initiated interactions with energy stakeholders and energy sector facilitators. Consequently, it is not well informed about the opportunities for financing renewable or alternative energy options or about incentives that can be tapped from the government and donors to offer lending products to energy consumers.

5.5.2 Obstacles and Barriers

- The Cambodians' knowledge of energy and power solutions is still limited to batteries, oil-fueled generators, kerosene, fuelwood, and LPG. Without a strong and intensive market awareness program to promote cheaper and better energy technology options, the potential for such options remain untapped.
- The absence of readily available, low-cost energy products in the market as well as the absence of strong market players with good decentralized sales and service network severely constricts the growth of Cambodia's energy sector.
- The different perceptions held by various stakeholders on energy micro-lending and AMRET (illustrated in Table 5.6) only underscore the lack of coordination and knowledge of each other's operations among the stakeholders in the businesses of energy and lending.

Table 5.6 Stakeholders' Perceptions of AMRET

STAKEHOLDER	PERCEPTION
Government	MFIs are needed to expand the energy access in rural areas, but do not know how to go about it.
Donor or development agency	Willing to provide financial incentives, but MFIs should pass along these incentives to the clients by reducing interest rates.
Energy company or supplier	The interest rates of MFIs are too high for the energy company or enterprise to be profitable.
Energy facilitator	Willing to provide technical risks guarantee, but sees a need for a flexible financing mechanism that meets the needs and income patterns of clients.
MFIs	They think charging a lower interest rate on one product will create distortion (ACLEDA); they are willing to create special energy lending if there is a guaranteed fund (AMRET); and incentives (i.e., reduced interest rate) are needed to allow energy enterprises to gain good profit margin (Maxima).

5.5.3 Key Lessons Learned

Co-ordination between different stakeholders. Despite the Cambodian government's inclination to expand energy access, an energy-lending model may not be successful if there is no co-ordination between different stakeholders, like that witnessed between AMRET, energy companies, and sector facilitators. This clearly reflects the need for both energy and microfinance stakeholders to build capacity, specifically to learn about each other's fields and the potential benefits of partnership.

Market education. Market education must be tackled and made a priority in order to scale up energy lending. It requires huge investment and cannot be accomplished by any one stakeholder alone. It is important that both energy and microfinance stakeholders as well as sector facilitators (government, donors, NGOs) work together to overcome this barrier.

Balance between flexible financing and a strong financial portfolio. It is important that MFIs create a balance between flexible financing mechanisms (removing any barrier to capital access) and maintaining financial health (to sustain the energy-lending program). AMRET has successfully demonstrated such a balance.

Necessity for a separate energy-lending product. As long as AMRET's energy lending is only for battery chargers or diesel generators, then it can continue as part of its business loan product: this kind of lending does not demand any special features or collaborations with other agencies. However, if AMRET wants to offer a specific energy product, such as solar photovoltaic or biodigesters, then it would do well to establish a separate energy-lending product line. In such case, it would need to enter into MOUs and design special loan appraisal, disbursement, and collection components.

5.5.4 Opportunities for Country Scale-Up and Regional Replication

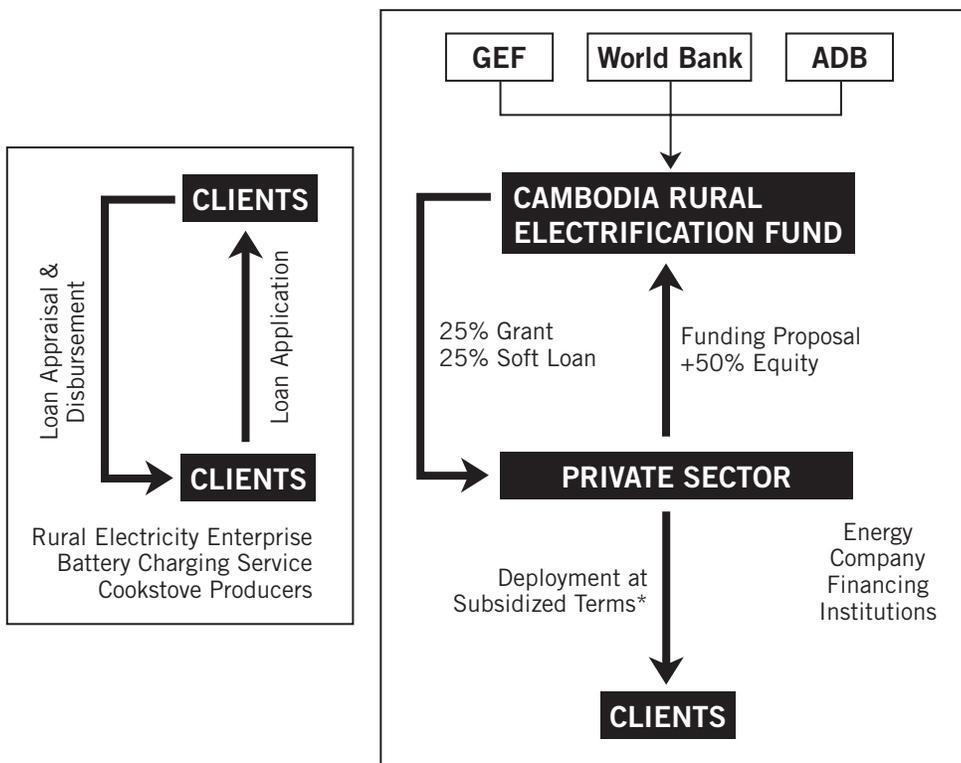
High cost of traditional energy sources. The baseline (conventional) energy solutions in Cambodia (e.g., dependency on fuelwood and imported oil fuels) offer great opportunities to introduce better and least-cost energy solutions. The role of MFIs is considered crucial to scale up these alternative energy solutions. Table 5.7 compares electricity prices generated from different energy sources in Cambodia.

Table 5.7 Comparison of Electricity Prices in Cambodia

Types	Price per kWh (US\$)
Solar home system	\$ 0.07–0.15
Micro/mini hydro power	\$ 0.04–0.07
Biomass electricity generation	\$ 0.30
REE diesel generator	\$ 0.50–0.90

Government support and dedicated government programs: The Rural Electrification Fund (REF) was introduced to provide credit and grant support to private sector and financial institutions to expand energy access in all districts of Cambodia. AMRET can tap this opportunity by expressing interest in collaborating with the government and accessing low-cost loan funds and grant support. The flow chart in Figure 5.1 shows the present lending process of a Cambodian MFI and the proposed flow of REF. MFIs can serve as a vital channel for REF and route its funds to rural areas through their existing rural bases to expand energy access.

Figure 5.1 Present Lending Operation and Proposed Flow of REF



Nepal's Biogas Support Program (BSP) offers a valuable example for Cambodia in how to run effective support for biodigester implementation. (In Figure 5.2, the red lines indicate possible collaboration.) One of the best practices that Cambodia can draw from Nepal's BSP is the holistic support that it provides to all stakeholders within the supply and demand chain of biogas systems. On the supply side, it ensures that suppliers can deliver quality products and services, and on the demand side, it offsets the inability of the target market (farmers) to acquire a biogas system for domestic use.

NBP is interested in collaborating with AMRET as they share similar target clients. NBP is ready to assume complete financial responsibility of any technical risk. AMRET's flexible financing mechanism provides a great opportunity for AMRET to meet the need of NBP target clients. Since AMRET has demonstrated a robust loan appraisal system resulting in a good loan portfolio, the combination of NBP's financial responsibility of any technical risks and AMRET's robust loan appraisal would create a good risk mitigation strategy for delivering effective biodigester credit program.

Sector facilitators. Cambodia has few energy sector facilitators—National Biodigester Programme (NBP), GERES, and SME Cambodia. NBP and GERES are willing to collaborate with MFIs to expand energy access, and SME Cambodia has already obtained financing support from E+Co to deliver energy via leasing. All energy stakeholders emphasized the need for credit to improve energy access. The existing infrastructure of MFIs in rural areas provides a ready-made foundation for promoting and marketing energy services and products.

Energy sector facilitators need to promote the growth of strong energy suppliers in the market and build strong market infrastructure. Donors need to provide technical assistance to energy stakeholders to help them design effective intervention mechanisms that promote a strong business environment for alternative energy and that take advantage of experiences in other countries.

Opportunities to expand lending to the energy market. With the low electrification rate in Cambodia, high energy and electricity costs, and very low income per capita, the role of MFIs like AMRET are key to providing comprehensive energy solutions. By combining a wider range of appropriate energy products and a credit facility to defray upfront capital requirements, AMRET has great potential to expand its financing business by catering to the energy market. Since the awareness by the target market of the alternative energy solutions is poor, and the market players are still immature, AMRET needs to be more actively involved in selecting the energy products, managing relations with the energy suppliers (to mitigate technical risks that potentially arise from poor product and service performance of the suppliers), and promoting its energy-lending products to its client base/target clients.

Healthy, flexible MFIs. What AMRET contributes to successful regional replication is its flexible financing mechanism and portfolio management rather than its limited and nascent energy-lending model. It should be noted that because Cambodia's energy business landscape is so immature, scaling up AMRET's energy loans is greatly dependant on external factors—policy makers, sector facilitators, and market players. Without serious collaboration with these stakeholders, AMRET will not stand a chance expanding its energy loans, nor will any of the stakeholders succeed without doing some basic groundwork.

It is important that MFIs join hands with MIME while it is still in the process of defining the mechanism for financing support through REF. Also, AMRET needs to collaborate with existing energy sector facilitators like NBP to create a win-win situation for everyone—MFI, energy service company, and client. The government and its agencies need to educate themselves about the MFI sector, and MFIs need to educate themselves about the energy sector and the opportunities therein for energy lending. Donors can play an important role by providing funds and expertise for capacity-building to both energy stakeholders and MFIs.

CHAPTER 6 • CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY OF FINDINGS ON ENERGY LENDING BY SEWA BANK, SEEDS, NUBL, AND AMRET

This research has shown that microfinance for small-scale energy consumers has contributed significantly to greater access to, and affordability of, modern energy technology for the poor and rural consumers. Strategic partnerships between MFIs and energy service companies are instrumental to effectively deliver modern energy solutions. Establishment of the energy lending programs studied is largely influenced by governments, donors, NGOs, and other sector players. Their support may be seen in pilot projects, market studies, policy, technical assistance, and provision of loan funds. Replication of energy lending by other MFIs or by other countries in Asia, may also need external interventions from the government or donors in the start-up phase.

Some measurable positive impact of energy lending has been demonstrated by the MFIs in this study. However, the extent to which energy loans can be optimized as a means to alleviate poverty and promoting business activities is not yet visible. At present, with the exception of AMRET, energy lending by SEWA Bank, SEEDS, and NUBL is primarily focused on household needs. SEWA Bank and SEEDS have promoted productive use of energy among their clients, but their records show this is still a very small percentage of the total energy loan portfolio. Focusing on loans for energy for income-generating activities may in fact hold the greatest market potential for an energy-lending program because the incremental revenue or cost efficiency generated by energy lending will increase the feasibility of the loan itself. On the energy supply side, the maturity of energy companies and the availability of decentralized sales and service networks are critical conditions for energy lending.

6.1.1 Establishment and Funding

The establishment of energy-lending programs among the four MFIs studied was mainly driven by emerging trends within their respective countries. Such trends were either introduced by government institutions, donor societies, or NGOs, or in response to repeated client requests. In the case of SEWA Bank, although its early exposure to the need for energy lending came from donor society meetings, its energy lending was driven by internal initiatives and funding, plus partnership with the energy company, SELCO. SEWA Bank also received various funds for its energy lending, directed to either technical assistance or market development.

In the case of SEEDS, as a response to the emerging demand for photovoltaic solar home systems, its parent organization (Sarvodaya) ran a pilot project that provided photovoltaic SHS with a credit facility, and then transferred the service to SEEDS. It receives loan funds and support from various institutions and projects, including ESD, RERED, National Development Trust Fund, DFCC Bank, National Entrepreneurship Development Board, SDLF, and Etimos. This strong government and donor society engagement in promoting renewable energy in Sri Lanka is one of the instrumental factors in scaling up and diversifying SEEDS' energy lending. This engagement included a market study, price subsidy, soft loans for energy lending funds, capacity building, and market education activities.

NUBL's first foray into energy lending was fully driven by a government loan fund for biogas micro-lending (AEPC, an apex agency established by the Nepalese government to promote alternative energy). However, this first attempt

was unsuccessful in attracting clients, so with the assistance of Winrock Nepal, NUBL restructured the design of its biogas lending product and re-introduced it on a smaller scale using its own funds. The new structure has proven to be successful as indicated by the growing numbers of clients requesting such a loan.

AMRET does not have a special lending product for energy loans, yet under its business loan scheme, it has been providing loans for the purchase of energy equipment. (For more details on the early stages of energy lending for each MFI, see Appendix 8.)

Comprehensive studies (in-house study; external study by government, donor, or NGO; or collaboration with other external parties) of needs assessment and energy market potential preceded the introduction of energy lending by SEWA, SEEDS, and NUBL. The characteristic of energy lending programs by these three MFIs are convenient “door-step” energy solutions, although SEWA has gone further by customizing energy products to meet the generic needs of its client base.

6.1.2 Energy Loan Products

The energy products offered by SEWA Bank, SEEDS, and NUBL were driven by the market trends within their respective countries. Their clients are able to take advantage of microfinance options to purchase energy equipment that is pre-designated by each MFI. SEWA Bank has taken a more progressive approach by offering a wider selection of energy products, ranging from photovoltaic solar home systems, photovoltaic battery charging, solar lanterns, sarai cookers, and improved cookstoves. It is actively exploring other energy products such as biogas. SEEDS products include SHS, grid connection, and village micro hydro. NUBL is currently comfortable with providing a single energy product, the biogas loan. Both SEWA Bank and SEEDS have designated the energy suppliers from which their clients purchase energy equipment. SEWA Bank engages exclusively with a single energy company, while SEEDS has non-exclusive agreements with numerous energy companies. Exclusive arrangements, as SEWA Bank and SELCO have, work well only if the energy partner shares the similar passion, mission, clientele profiles, and business approach as the MFI. Because AMRET does not have a special energy-lending program, their clients have the liberty to choose the desired energy products from any suppliers, as long as their cash flows indicate good repayment capacity.

Except for AMRET, the loan amount for the energy lending is normally pre-determined by the respective MFIs, given the type of energy product. SEEDS energy lending represents a wide range of loan amounts—up to US\$ 1,000 for photovoltaic SHS, \$150 for grid connection, and up to \$20,000 for micro hydro. Specific to NUBL, since it only provides a single product, the loan amount is set at around \$215.

In general, there is a huge difference between the MFIs in South Asia (here India, Sri Lanka, and Nepal) and those in South East Asia (Cambodia), especially in interest rates and collateral requirements. AMRET’s interest rate is more than double the other MFIs in the study. AMRET also requires collateral up to two times the loan amount, while other MFIs do not ask for collateral (except for SEWA Bank, on loans of more than INR 50,000 [US\$ 1,103]). SEEDS’ interest rates for energy lending are relatively lower than the other MFIs due to subsidized loan funds received from a Sri Lankan energy-sector program. Grant support from the Lemelson Foundation enables SEWA Bank to give a 7-percent interest refund to clients with successful loan completion and good credit discipline. Since such support is not sustainable in the long run, MFIs need to effectively communicate with donors to avoid distortion of their usual lending terms and use the grant or subsidy support only for initial development of an energy-lending program.

The clients of SEEDS and NUBL are able to obtain energy products at lower-than-market prices due to price subsidies provided by government and donor programs. Such price subsidies make the energy products more affordable to larger market groups. As recorded by SEEDS, soon after the introduction of the price subsidy by the government, the number of its new solar loan clients increased significantly.

Compared to other three MFIs, SEWA Bank clients enjoy the most flexible loan installment scheme in terms of frequency and amount. Although the NUBL and AMRET schemes do not have the same level of flexibility as SEWA Bank, they do however provide customized loan schemes to match the cash flows of their clients.

In terms of eligibility, the lending programs of SEWA Bank, SEEDS, and AMRET are available to both old and new clients. This stands in contrast to NUBL, which requires that clients complete two loan cycles before being eligible for a biogas loan. However, by allowing the biogas loan be a parallel loan to one or two other loans, NUBL's biogas lending program extends accessibility, particularly to clients who want loans for cattle (or sanitation improvement) to supply the organic component needed by biogas systems.

SEWA Bank's energy lending program adopted customized energy solutions as a unique feature. By providing their prospective energy clients with a 15-day trial of the energy product, the clients have the opportunity to experience whether the selected energy product is the right energy solution for them.

6.1.3 Institutional Approach to Energy Lending

AMRET's energy-lending strategy is limited to offering credit for purchase of energy equipment like any other product and thus has a limited scope. By contrast, SEWA Bank and SEEDS take a more hands-on approach to the provision of energy services with close associations with energy suppliers and establishment of a special bank unit for energy. At NUBL, although the field officers receive technical training, they tend to be too passive in advancing the loan due to their workload promoting all products. NUBL officers expect the biogas company to take a more active role.

6.1.4 Relations with Energy Suppliers

The MFIs studied demonstrated a wide range of approaches to their relations with energy suppliers. For the URJA Project, SEWA Bank crafted an exclusive arrangement with SELCO to develop and implement a one-stop energy shop that offers a wider selection of better energy products together with a credit line. This exclusivity is underpinned by similarity of mission, approach, and target clients. Both parties invest resources and funds to promote the URJA Project: SELCO's contribution ranges from assessing energy needs and advising SEWA Bank clients on the best technology for them, providing trainings/capacity building (product knowledge) to SEWA Bank's loan officers and commissioned agents, conducting market awareness and promotions hand-in-hand with SEWA Bank, installing and removing energy systems for 15-day trials at clients' premises, installing equipment permanently, and providing user training, equipment warranties, and after-sale services.

In contrast, SEEDS pro-actively engaged a range of energy partners in the provision of energy supply for its energy loan clients in non-exclusive arrangements. To ensure quality deliverables to its clients, SEEDS entered into MOUs with SHS suppliers.

In the case of NUBL, due to strong technical support and quality control of biogas companies in Nepal by the Biogas Sector Partnership (BSP), MFIs like NUBL do not have to control the quality of biogas company deliverables. Therefore, NUBL thus far is not compelled to set up special MOUs with any of the biogas companies. The side effect of such a situation is that there are obvious gaps in the expectations of the NUBL and the biogas companies. Each expects the other party to take an active role on promoting the biogas system and the biogas loans.

Special relations with energy suppliers is not applicable in the case of AMRET since they do not have special lending program for energy and limit themselves only in providing the credit facility to their business loan clients.

6.1.5 Management and Financial Capacity

These four MFIs are recognized as leaders in their own rights, making significant contributions to improving access to financial service among poor consumers. Using the financial parameters alone to evaluate the performance of their management and financial capacity may not give full justice to them. Rather, one needs to understand the mission and objective of the respective MFIs, as well as the country contexts that underlie their operation.

SEWA Bank's "service-first" philosophy has shaped its loan product, and it has offered highly flexible terms for the frequency and amount its energy loans. Consequently, using the standard MFI rating methodology to evaluate SEWA Bank's portfolio quality may not be suitable. SEEDS' portfolio quality can be tracked at the head office and branches. However, repayments have suffered to some extent due to unexpected expansion of the electricity grid in areas where SEEDS has provided SHS loans. NUBL's portfolio management suffered because of external political disturbances and a faulty incentive structure that it implemented in the past. AMRET, as a relatively new MFI, has the benefit of being a "follower" and benefiting from the best practices of other MFIs. This is apparent from their portfolio management which includes good client selection, a sound loan appraisal process, prompt follow-up on loans, and consistent credit discipline.

SEWA Bank's use of commissioned agents to extend the reach of its financial service operations and energy lending leverages its human resources without creating a fixed financial load on its overhead. SEEDS' proficiency with the energy technology, strong control of energy suppliers' deliverables, risk management strategy, wide geographical presence, and impressive number of disbursed energy loans highlights its strong management capacity for energy lending. NUBL's decisions to limit eligible biogas client only to old clients with good credit records and to allow biogas loans as parallel loans also are good risk mitigation strategies. In the case of AMRET, although they have no proficiency in energy technology, they have excellent portfolio quality, imposed good credit discipline among its clients, and have a well-defined methodology for product development.

For SEWA Bank and NUBL, it is too soon to evaluate the portfolio quality of their energy lending because during the time of this study, their energy operations were relatively new and loan repayments were 100 percent. The financial performance of AMRET's energy loans is not accounted separately from its overall business loans. SEEDS' separate energy division at the head office and separate staff to provide energy services at field level have contributed to the scaling up of its energy lending. SEEDS energy lending accounted for over 30 percent of its total microfinance operation.

6.2 LESSONS LEARNED

The experiences of SEWA Bank, SEEDS, NUBL, and AMRET, although still in their infancy, can offer several lessons in the design, implementation, and scaling up of energy lending activities in Asia.

Understand the country context. Designing and establishing an energy-lending program should carefully take into account the country context that may influence the selection of technology, energy service company, loan product, and loan methodology. Understanding existing energy supply chains and the energy-technology financing environment before introducing an energy loan product is crucial. In the case of SEWA Bank, because India's energy and electricity prices are moving towards true market prices, the introduction of better and cheaper energy solutions that are integrated with a credit facility is becoming a lucrative market opportunity. However, the price differential between existing energy prices emerging out of a subsidized energy market and alternative energy sources like solar can be offset by SEWA's customized service and flexible financing scheme, making it attractive to potential consumers.

Different situations exist for SEEDS and NUBL, both of which benefited greatly from renewable energy support programs in their respective countries. The availability of a low-interest loan fund and price subsidy for SHS clients in Sri Lanka contributed to the scaling up of SEEDS' energy lending portfolio. The strong monitoring of biogas companies in Nepal and provision of price subsidy provided by the Nepalese government enabled financing institutions

like NUBL to benefit from mitigation of technical risk and extensions of the biogas loan to more, poorer clients. Thus, for countries where such supports do not exist, the financing institutions and energy service companies need to work creatively to overcome the challenges.

AMRET, given Cambodia's very low electrification ratio and the very high baseline price of electricity and energy, should be able to take advantage of the opportunity to provide better and cheaper energy solutions to its clients.

Both the MFI and energy service company must be committed to energy lending. The provision of microfinance for renewable energy technologies requires serious commitment from both the MFI and energy service companies, especially if the technologies offered are new to the target clients. In such cases, market awareness of both the technology and the loan product, the quality of product and service, user training, and after-sale services need to be instituted. From the MFI's perspective, introducing energy lending requires full support from management due to the enormous resources needed at initiation and development phases. Because energy-lending is a relatively new field in Asia, as are the energy technologies to clients, it is important for MFIs to partner with energy companies that also want to provide affordable energy services to lower-income populations and are willing to take on additional responsibilities in order to do so. The reliability of energy companies as well as the quality of the technology and services very much influences the reputation of the emerging field. All stakeholders should play a proactive role in minimizing potential problems. The consistency and persistence in marketing energy products require joint efforts from both the MFI and the energy companies. SEWA Bank and SELCO demonstrated an excellent example of strong partnership: both take responsibilities beyond their normal roles. Although NUBL interacts well with energy companies, the absence of MOUs with them, however, leads to less clear definitions of roles and responsibilities, and common understandings often are not effectively passed down to the field officers of the MFI and the energy companies.

Prior market research is necessary to understand market need, characteristics, and size. Designing an effective energy-lending program requires a comprehensive understanding of the energy solutions the market needs; the characteristics of the market (especially the baseline energy consumption profile); client income profile; and geographic spread of clients, energy suppliers, and finance institutions. Such information allows MFIs and their energy partners to choose the type of energy technology and design the loan schemes and the delivery mechanisms to offer. The best practice is to start with the MFI's existing client base.

Piggyback on existing infrastructure whenever possible. Introducing a new loan product requires substantial resources during the start-up phase; hence taking advantage of, and using, existing infrastructure or resources is important to minimize the initial investment. SEWA Bank is the perfect example because it utilized every existing infrastructure and marketing channel to create awareness of their energy lending products. That includes employing commissioned agents to deploy information or carry out product trials, and pitch the energy products during meetings with SEWA's business and financial clients (as well as during other programs and events of their sister organizations). They also promote energy product information via their mobile banking, and participate in SEWA's monthly trade fair by staffing an energy stall.

Loan delivery mechanisms should be reviewed periodically and revised when necessary. Introducing a new loan product for an emerging field may not always begin with a "perfect" scheme. After implementation, periodic review is needed to evaluate the effectiveness of each energy product model so that service delivery and outreach to more clients continuously improves. Possible revisions could be adjusting eligibility criteria, interest rates, loan repayment terms, loan tenure, payment and equipment disbursement, installment scheme, and after-sale service. Some additional instruments, such as credit insurance, may also be added. Feedback from target clients and other stakeholders may provide the best input to guide necessary revisions. NUBL had to majorly restructure its biogas loan before it paid off and seriously attracted clients.

Energy lending needs to be institutionalized. To succeed in the long-run, MFIs need to understand the huge market potential and opportunity offered by energy products to expand their operation. However, management support at

the strategic level is needed to institutionalize energy lending within the MFI, for example, to avoid dependency on one staff person for promoting and coordinating energy operations. This dependency exposes the sustainability of the energy lending to great risk, should the staff member leave for any reason or must dedicate time to other products. The institutionalization of energy lending needs to be decentralized at the branch level as well because that is where the MFI primarily interacts with clients. Branch managers and loan officers must be appropriately motivated to promote energy products when also they also offer competing products that require less time and are not as technology intensive. SEEDS' success—its energy lending is more than 30 percent of its microfinance portfolio—is very much due to the fact that it has specialized energy lending units at both the head and branch offices. In the case of AMRET, because they do not have a special energy-lending program, much less a dedicated unit to promote it, its portfolio of loans for energy products most likely will remain small and insignificant, while the market potential in Cambodia is huge.

6.3 OBSTACLES

Implementing energy lending by the MFIs studied has two categories of obstacles: internal and external. Internal obstacles have arisen from factors within the organization related to model, methodology, systems and capacities, portfolio quality, internal perceptions and funding availability. Those external to the organization relate more to policy environment market infrastructure, availability of technology and selection, presence of energy players, market competition, market awareness, and interactions between the energy and microfinance sectors.

Model. The microfinance model adopted by an MFI can limit outreach of an energy product to some extent. NUBL uses a group-based lending methodology and, as a result, it does not offer financing to clients who are not part of its loan groups. This has been a big turn-off for many biogas companies. By contrast, SEEDS will finance any clients selected by the energy company as long as they are creditworthy. Although NUBL has individual clients for one of its loan product (a micro-enterprise loan), the overall experience has not been good because of a high number of defaults. As a result, NUBL feels more comfortable with group-based lending.

Methodology. Some features or conditions in the methodology may restrict the growth of energy lending. For example, the risk mitigation strategies of MFIs like NUBL, though in line with microfinance best practices, restrict first-time clients from taking energy loans. Due to the technical risk involved and consumptive nature of the loan only repeat clients with successful credit history are eligible to take energy loans. Keeping in view the potential of biogas lending in the area, NUBL needs to strengthen its appraisal techniques for the biogas plant loans so that new clients can be also eligible. In addition, there is a prevailing perception among clients that the current loan size (NR 15,000) is too low and should be raised to 20,000 NR. Thus raising the loan cap in the medium term supplemented by a more robust appraisal methodology may be helpful to encourage more clients to take biogas loans.

Systems and capacities. As observed during the field research in the case of SEEDS, management capacities and systems of many MFIs restrict servicing and monitoring remotely located clients, from where a major chunk of demand for energy services, is likely to come. Such internal capacities of an MFI may restrict the growth of its energy portfolio. For example, SEEDS management has slowed down its disbursements, beginning with repayments to lenders, because it is not very sure if it will be able to meet the multiple challenges of energy lending on a continuous basis. Although SEEDS is the pioneer in energy lending, its internal weaknesses have restricted it in achieving optimal scale of operations, despite having good infrastructure and long-term fund support at favorable terms.

Portfolio quality. Portfolio quality has a direct bearing on financial performance and institutional sustainability. For a microfinance program to become sustainable, it is important that the MFI maintain good portfolio quality. As with SEEDS, weak portfolio quality has resulted in sub-optimal yield and has been one of the main limitations in expanding energy access. As a result, despite its low costs, the energy program is only marginally profitable.

Lack of awareness and institutionalization of systems for promoting energy. Lack of knowledge of energy sector and alternative energy options, lack of certainty about the sustainability of financing, and misperceptions about microfinance were observed to be limiting factors. In the case of NUBL, the management has set overly conservative targets for financing biogas loans because it is not sure of the product off take. Some of the staff in the branch offices feel that energy loans are additional burden to them as currently there are no institutional systems to incentivise frontline staff for promoting energy loans. As an institution AMRET has not yet explored the full potential of energy lending which limits its current scope.

Funding. Although none of the organizations studied has fund constraints, it is important to note that this could be a limiting factor for smaller MFIs operating in same regions. For example in Nepal, there are many co-operatives and MFIs that depend upon AEPC for funds for energy on-lending; however, its extraordinarily lengthy and slow disbursement process has been a major constraint in expanding energy access by MFIs. Also cost of initial market development and technical orientation of the MFI staff for introducing energy products could be high and thus there is a need for effective donor coordination and deployment of resources to meet this requirement.

Policy environment. The practices of energy lending by these four MFIs, to a certain extent, have been much influenced by the policy environment. Some of the typical obstacles rooted in the policy environment may include:

- potential distortion of the energy product market from subsidized, technology-driven programs (e.g., government subsidy for solar cookers in India);
- potential distortion of the energy product market, resulting from government credit enhancement schemes provided to select finance institutions (often focused on state-owned banks); and
- potential market barrier due to price distortion if the national energy and electricity pricing policy does not represent true market value (e.g., being subsidized), and thus creates an asymmetric playing field for renewable or cleaner energy technology that is the object of an MFI's lending program—unless there are also subsidies for the renewable energy technology.

Available technology options. Credit facilities for energy lending require that available energy technology options be field proven and be more cost efficient, have better performance, and be more user friendly than baseline technology. In AMRET's case, the absence of readily available, better, and cheaper technology options in the Cambodian market hampers the potential of expanding an energy-lending portfolio. The energy-lending market of MFIs shrinks considerably if the energy market for poor consumers is not growing. Similar but slightly better conditions exist in NUBL's case, where the field-proven and more cost-efficient option thus far is limited to biogas, although rural energy consumers require more energy solutions to meet all of their needs (lighting, energy for productive use, etc.).

Strong energy players and market infrastructure. For energy markets to grow and produce potential market opportunities for energy lending by MFIs, it is crucial to have strong energy players and market infrastructure. The starting point is a pragmatic focus on those networks that will disseminate, install, service, and support rural energy systems—in other words, a focus on building market infrastructure with decentralized sales and service networks. This must involve commercial energy suppliers of better technology with reliable after-sale warranties and service. The absence of strong and sufficient energy players definitely hampers the expansion of energy lending by MFIs. AMRET faces such a condition, where energy suppliers of alternative energy technology are limited, mostly driven by government and donor projects. Many are still in pilot projects and have small and/or geographically limited sales and service networks.

Market awareness. Expansion of energy lending requires understanding whether better energy technology options are available in the market, as well as the potential for energy lending. The ideal scenario for building good market awareness is strong coordination and collaboration between all relevant energy market players and stakeholders. The market can thus grow because the burden is spread among them. Compared to the other MFIs in the study, AMRET

faces the greatest challenge in expanding its energy lending because there is little market awareness of energy options and lending products among Cambodians in general. Energy for Cambodians in areas not served by EDC is limited to diesel generators and batteries. If there is no market education to introduce better technology options, the energy market will be saturated by traditional energy sources and the market potential of energy lending will also decline. The limitation caused by poor market awareness can also be seen in NUBL's experience, where the lack of clarity of the roles to be played by NUBL and energy suppliers has curbed market awareness of NUBL biogas loans.

Market competition and business entry risk. Though MFIs have a very special product to offer in terms of customized products and services for energy, competition for SEWA, NUBL and many other new MFI entrants may come from mainstream commercial banks that are very actively entering into the microfinance arena especially in countries like India. While it is a welcome idea, the need for high initial investment in market development and capacity building may pose serious business entry risk for new MFI entrants as there is a chance that banks may take over the MFI's client base in the medium term and MFIs may not be able to recover this initial investment for market development. Therefore there is a strong need for coordination with the banking sector in order to complement roles and bring in synergies.

Interactions between energy and microfinance sectors. The absence or lack of interactions between the energy and microfinance sectors is a significant obstacle to expanding energy lending, not only from a micro-context (MFIs) but also from a macro-context (the whole country). Lack of general awareness about energy products as well as absence of felt need for coordination seems to be an important bottleneck. This is exemplified by the case of AMRET in Cambodia, where the MFI and energy companies have not yet explored any partnerships either for product enhancement or improving client and geographical outreach.

6.4 OPPORTUNITIES

The market potential for energy lending by the MFIs studied is huge, especially because the electrification rate among poor and rural consumers is still very low. In addition to lighting, energy demand among these consumers mostly includes cooking and energy for productive use or revenue generation activities. Strategically using existing client bases as primary market targets for energy lending opens a relatively big market, given the premise that most clients have energy needs and will be responsive to the offer of cost-efficient or revenue-generating energy option. Feedback from clients also helped the MFIs shape their energy product, such as the design of the energy product—e.g., user-friendliness, maintenance and operation, product pricing, users manuals and effective training, as well as quality, usability, and durability. It also influenced the design of the lending product (e.g., loan amount, loan term, interest rate, eligibility requirement, and loan repayment scheme) and the design of the lending methodology (e.g., loan application process and collection mechanism)

Market potential can be assessed from the gap between supply and demand of energy, such as the low electrification rate in the case of all the countries studied. For example, the 2 million households in Sri Lanka without electricity are mostly located in rural and estate areas and are the potential market for energy lending. In Nepal, BSP estimates that there is a market for 1.9 million units; so far 160,000 units have been installed. Further, since more than 50 percent of NUBL's 75,000 clients have loans to purchase cattle, NUBL has a strong client base for biogas loans.

SEWA Bank surveyed the energy demand of its 290,000 clients to understand their demand for energy and characteristics, and developed energy products and energy lending based on these profiles. In addition, SEWA Bank could tap the 700,000 client base of the full SEWA organization, which opens a huge market within which it could integrate energy lending with a housing program, health program, education program, and other SEWA parent businesses. The market potential in Cambodia is even higher because, compared to India, Sri Lanka, and Nepal, its electrification rate is among the lowest (17 percent nationally, and 13 percent in rural areas) and prices are among the highest (between US\$ 0.3–0.92 per kWh). However, this market potential is illusory unless better and cheaper technology options become available and strong energy market suppliers emerge. The advent of new business opportunities for

the clients of MFIs, namely energy service entrepreneurs, multiplies the impact of an increasing new revenue stream and employment opportunities.

MFIs have geographical presence in potential market areas for small-scale energy. While the current trend in Asia is for the formal banking sector to begin to offer microfinance services to small-scale energy clients, MFIs have greater flexibility to work in more remote and volatile areas. They already have better geographical presence in the rural areas that constitute a huge market for small-scale energy products. In the case of NUBL, political conflicts have forced banks to move away from rural areas, leaving MFIs as the sole financial service institutions there.

6.5. RECOMMENDATIONS FOR REGIONAL REPLICATION

1. Strong co-ordination among relevant stakeholders. Good co-ordination among all stakeholders—MFIs, investors, sector facilitators, technology owners, energy service companies, and other market players—helps leverage the scale of the market, minimize potential market distortion, increase efficiency, synchronize the various and complementary roles of the stakeholders, and create a vibrant market system. The ideal map for various stakeholders that builds an enabling business environment for expanding the energy lending is illustrated in Figure 6.1.

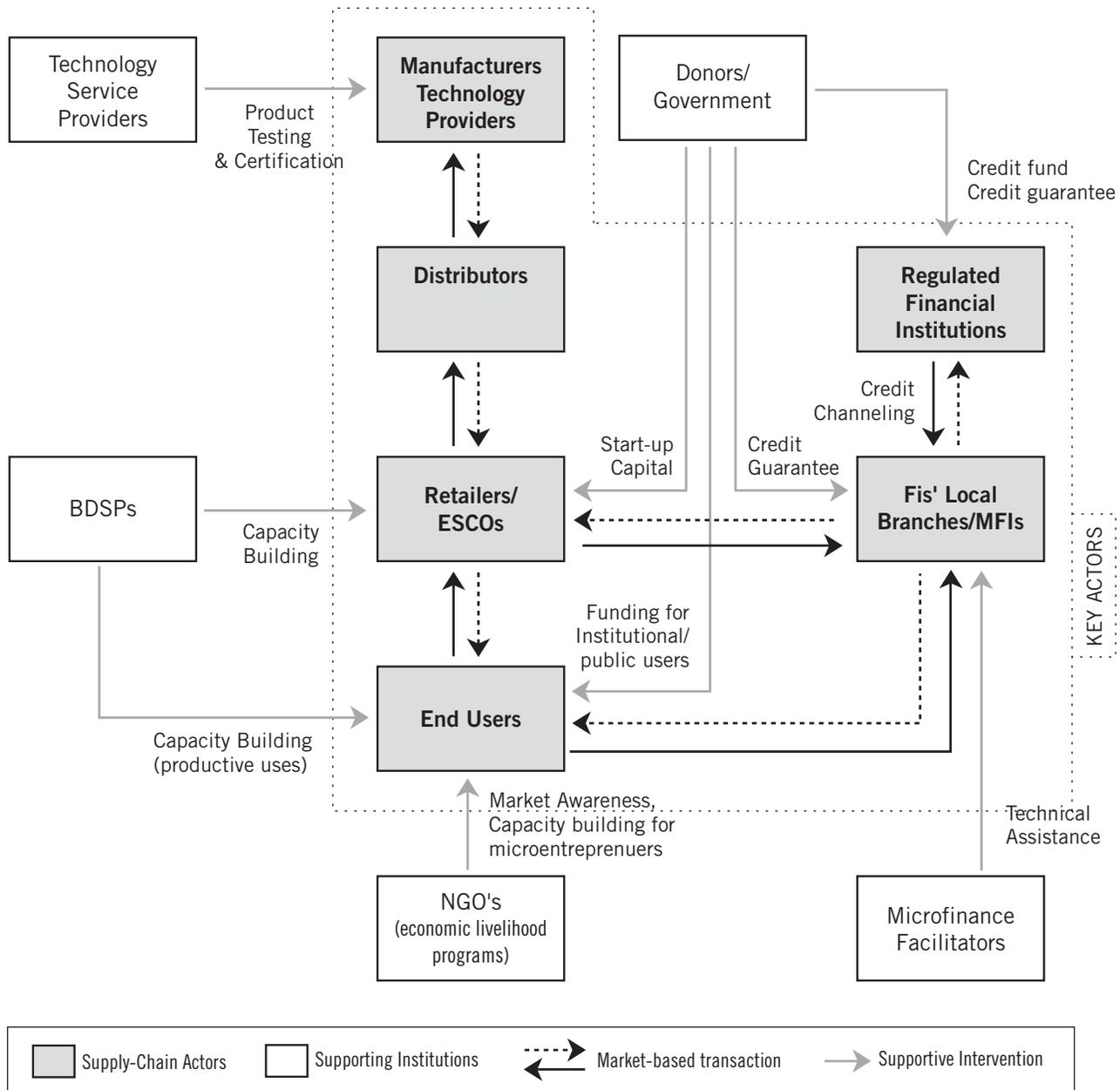
Based on the experience of the four MFIs here, it can be concluded that collaboration between MFIs, energy suppliers (technology companies), and energy sector facilitators (policymakers, donors, NGOs, industry associations) offer a number of options:

- Aligning energy lending with other livelihood programs that require energy provision, such as housing loans
- Aligning energy lending with enterprise/business development programs that require energy for productive use or income-generating activities
- Aligning with NGOs and other sector facilitators which are ready to scale up proven energy technology to commercial levels via a credit facility
- Tapping into credit enhancement and technical assistance schemes offered by sector facilitators (most likely government and donors) to help offset challenges during the initial introduction of energy lending

2. Innovative product development, both technology as well as credit, appropriate to the market. The design of an energy lending product must meet the needs of energy consumers, offer a flexible delivery model, and optimize the client base as the main target market. At the same time the energy product technology offered should: be demand driven, contribute to cost efficiency or the revenue-generation activities of clients, fit the income and cash flow profile of clients, and have positive health and social impacts. Thus it might be a good idea for the MFI to first explore all available technology options and identify the best fit for the community and then build suitable financial products to improve its off take.

3. Innovative technical and credit risk mitigation. As with any lending business, financing energy solutions involves credit risk as well as risk from failure of the energy technology, change in technology or access to better technology, lack of service infrastructure, and misuse or underutilization of the energy equipment (if there is poor or no client education), etc. The various risks can best be managed through joint collaboration of energy and microfinance stakeholders. Risks should be shared among stakeholders based on their expertise and should not create incremental barriers for poor consumers. Financing energy solutions calls for innovative risk mitigation strategies, such as pre-defining deliverables in MOUs signed with energy suppliers (high standards of quality on suppliers, warranties, buy-back options, and client education), building market infrastructure, requiring and monitoring after-sale service, establishing links to formal insurance companies (if possible) or creating an internal insurance fund (with a limited liability clause) to cover various risks to consumers and MFIs, co-ordinating with other energy companies or facilitators (e.g., an electricity

Figure 6.1 Energy Lending Co-operation and Co-ordination Among Key Stakeholders



Source: Khaula Karya Foundation, "Energy Business Development," working document (Jakarta, Indonesia: Yayasan Khaula Karya, 2006), <http://www.khaula.org>.

board to avoid areas where it plans to extend the grid), and involving partner energy stakeholders in credit appraisals, feasibility analyses, and cost estimates, etc.

4. External funding for research, market promotion and introductory pricing. It is crucial to provide financing to both the MFI and energy service company that might cover product innovation (research and development), market development, and product promotion in the initial stages as there is less felt need among clients for sustainable and eco-friendly energy products. In the initial stages there is a need for a good marketing campaign for the energy technology and supply-side subsidies for making the lending products affordable and attractive. In addition, innovative approaches, such as product trials by the prospective consumers, or tie ups with other broad based non-profit organi-

zations in the area may be effective means of market education and spreading the costs across multiple organizations as it might be difficult for most MFIs to absorb the cost of market development by themselves. MFIs that have a non-profit arm may be well suited to initiate energy lending in order to absorb some of the initial costs of product promotion as well as capacity building. This could also help absorb the initial risk of product development without affecting the overall portfolio quality of the MFI.

A supply-side subsidy may be needed in the beginning for some energy products to bridge the gap between market price and consumers' affordability. These subsidies have proven to be effective in promoting domestic biogas plants in Nepal, and SHS and village micro hydro schemes in Sri Lanka. The price subsidy helps to bring down the effective cost of equipment and/or installation for the clients. Supply-side subsidies are important if the price of equipment increases beyond the reach of poor. (In Sri Lanka, the price of solar photovoltaic increased by almost 30 percent over the last 1.5 years to the point where SEEDS believed that any further increase would put it beyond the reach of most of its clients.) The challenge with a price subsidy is to target and reach the right clients, which requires clearly identifying those clients who qualify for the subsidy and applying the concessions based on sound criteria.

And finally a balance needs to be created among the commercial, social and environmental interests of the MFI so that it can tap the emerging growth of energy lending. This balance would help sustainable business growth, strong customer loyalty, and the ability to take advantage of mission-based funding opportunities.

5. *Aligning energy program with MFIs' capability to manage technology-related solutions.* The success of energy lending by MFIs depends on management capability to design, customize, and service the various needs of clients; to successfully collaborate with external agencies to enhance strategic strengths, minimize risks, and widen the service base; to adopt professional management systems to enhance transparency and accountability; to take on risk, experiment, and adapt to change; and to balance commercial and social objectives. Since Energy lending is not the core business of most MFIs, it is seen that MFIs involved have gone through a learning cycle wherein they have initially retained some functionalities in house—for example, stock management as in case of SEEDS—but have outsourced it at a later point as the organization's learning process evolved. The cases of SEWA Bank and SEEDS demonstrate that MFIs can in fact master the energy technology piece. SEWA Bank's proficiency in understanding the nature and characteristic of available energy technology enabled it to design an appropriate technical risk mitigation strategy, institute robust product and service standards for the energy suppliers via MOUs, design and customize energy products that meet the needs of its members, design effective marketing strategies, monitor and control the product and service delivery by the energy suppliers to its clients, and actively disseminate comprehensive information to prospective customers on both the energy product and the loan product. Therefore it may be important for MFIs to consider these multiple dimensions in order to create a sustainable and robust energy lending model.

6. *Understanding the MFIs' larger challenge to cater to the "poorest of the poor" markets.* The need for better energy solutions can mostly be found among the most poor, the segment of population which most MFIs still fail to serve. This is a significant challenge, especially for MFIs because the scale of financing involved in energy lending may require a larger quantum of loan as compared to traditional micro-credit and needs to be secured through some mode of collateral. Of the MFIs involved in the study, SEWA Bank's approach is friendlier to the poorest of the poor, due to its customized energy product and flexible loan repayment scheme. SEWA Bank also emphasizes energy technology selection that contributes to better cash flow for its clients (by reducing the cost of energy or increasing productivity and yield as a direct result of using a product). The direct or indirect incremental cash generated from such an approach enables the energy clients to repay their loans. SEEDS while highly proactive in reaching out to a diverse set of clients, finds its management capability inadequate to handle the challenges of reaching out to the poorest of the poor. Under its current biogas loan policy, NUBL cannot target the poorest of the poor energy consumer because its biogas loan is classified as a consumption loan and eligible borrowers must have a proven credit history with NUBL and also should own some form of farm/backyard enterprise like dairy as a prerequisite for qualifying for biogas loans. This type of policies, while a prudent financial practice, may create barriers for first time borrowers, even those with good cash flows.

7. *Addressing the strategic conflict.* Adopting and introducing special loan products such as energy lending requires strategic decisions, especially when there is potential conflict of priorities between promoting a general financing program and an energy program. Energy programs require large loans with longer loan terms—which for most MFIs mean higher credit risk and are limited to those clients who have proven creditworthiness. Moreover, most MFIs prefer to lend for productive purposes and energy loans are often perceived to be for consumption. In addition offering energy products may be sometimes a dis-incentive for the frontline loan officers given the relatively higher investment of time in client development. All this could make offering energy loans somewhat less attractive to MFIs. At the same time interest rates charged by MFIs are perceived as high by energy stakeholders, who may not understand the realities of microfinance upfront. This could prevent strategic collaborations between energy companies and MFIs.

With commercialization, MFI operations are driven to attain profitability in a short-to-medium time span, which demands fast portfolio growth. However, growth of energy lending cannot be expected to be as fast-paced. Marketing and client education efforts may require a longer gestation period, installation of energy equipment takes time (construction of a biogas plant takes 20 days), two or more agencies may be involved (with cost and/or feasibility analyses by each energy player), seasonality is a consideration (no construction or dysfunction of certain technologies during monsoons), certain geographical locations are challenging (hilly regions or regions with less sunlight), and field officers need special technical training.

MFI collaboration with energy stakeholders for energy lending, if not done under an appropriate institutional framework, can be perceived as interference since MFIs may need to build exclusive systems to suit the requirements of energy stakeholders. Moreover, external challenges over which MFIs have no control—such as the sudden, unannounced grid expansion can make investment in energy lending uninviting.

6.6 REPLICATING MFI MODELS

The rule of the thumb is that there is no one-size-fits-all model for replication. Any MFI interested in introducing energy lending program needs first to understand their country context and market profile and then choose those elements from best practices that best fit its situation.

SEWA Bank model: Among these four MFIs, SEWA Bank's energy lending has the most pro-consumer approach and the fewest barriers to the economically active poor, and thus is the most ideal model to increase the access of poor consumers to modern energy. However, there are a number of pre-requisites and a country context that specifically contribute to the viability of its model, which must be taken into consideration:

- The energy and electricity price within the country must be market driven (representing true cost) because this condition enables renewable and cleaner technology to compete with conventional energy and electricity solutions.
- It requires strong commitment and support by top management to promoting energy lending as one of the ways to achieve the MFI's mission.
- Any energy partner that exclusively collaborates with the MFI must share a similar mission, approach, and target clients with the MFI, and essentially be a social entrepreneur that is willing to balance the social, commercial, and environmental goals.
- The energy partner must have the strategy to build adequate decentralized sales and service networks to sufficiently cover the geographical areas where the MFI operates.

- Both the MFI and its energy partner must agree and commit to a similar program of energy lending (e.g., such as a one-stop energy shop with customized and demand-driven energy and lending products) and be willing to invest their funds, resources, and networks jointly to build the energy lending program.
- The MFI must have a significant client base as the potential market for energy lending product. In addition, to increase the cost efficiency of introducing customized energy products, it is preferable if the client base has similar, rather than varying, energy needs.
- The MFI must have a strong market infrastructure which the energy-lending product can build upon and thus reduce the marketing and promotion costs.
- The MFI needs either to secure grant funds or carefully calculate its cost structure before introducing an interest refund as an incentive for clients to pay regularly.

SEEDS Model: Among these four MFIs, the SEEDS energy lending program is the oldest and has the widest geographical coverage and biggest portfolio. However, it had significant help in developing its program and the favorable conditions it operates under.

- Strong government policy and support from sector facilitators adds a huge advantage to introducing a renewable energy/electrification program. In Sri Lanka, this included providing technical assistance (e.g., imposing minimum standards for product and services, fostering the growth of strong energy suppliers and other market players, creating public awareness, and helping build the capacity of finance institutions) as well as a financing facility (e.g., loan fund, credit enhancement schemes).
- Strong market players need large decentralized sales and service networks, which overlap with the geographical presence of MFIs. These market players must comply with good standards of products and services to minimize potential arrears resulting from technical risks.
- Strong top management commitment to develop the energy-lending program should include a dedicated division, supported by sufficient staff that are specifically trained for energy lending.

NUBL Model: Compared to the other MFIs, NUBL is a relatively new MFI and has a small portfolio. However, its energy-lending model has strong potential to expand, given certain considerations. MFIs should commit to developing energy lending and even be willing to use their own funds, and to customize the loan product to meet specific demands. NUBL offered its biogas loan as a parallel loan to its clients' loans for cattle and sanitation improvements, which in turn provided them with necessary organic elements for their biogas system.

- Having a widespread geographical presence in areas where there is a large need for alternative energy solutions should be taken advantage of.
- Sector facilitators should fully support capacity building, standards for products and services, and market awareness.
- Strong market players should provide decentralized sales and service networks that overlap with the MFI's geographical presence in order to provide quality products and services as mandated by the government.

AMRET Model: AMRET's lending model is the only one of the four MFIs whose energy lending falls under a general business loan and is not a special product. Although its potential thus far is limited by Cambodia's immature energy sector, AMRET shows that an MFI can provide flexible financing to its clients while maintaining its portfolio quality. Areas for intervention include product documentation, establishment of standards, training and employment of sufficient numbers of installation and maintenance technicians, knowledge management, and creation of market/client awareness.

6.7 OPPORTUNITIES FOR MFIS AND OTHER MARKET PLAYERS

Micro-lending for energy consumers offers great potential for MFIs to expand their business beyond existing client bases. However, being knowledgeable about energy technology and actively interacting with energy sector players are key when designing an energy-lending program that produces a robust loan portfolio. The best practices and lessons learned from this research, as well as country-specific contexts (e.g., policy environment, energy scenario, market infrastructure, and energy supply chain players), provide a good starting point for other MFIs in developing countries for crafting their own effective energy-lending programs.

The global initiatives that call for utilizing MFIs and microfinance as a strategic means to expand access to modern energy services among poor consumers also provide opportunities to reach economies of scale, particularly with small-scale, decentralized, or individual energy solutions. For many years, the market for such energy solutions was frustrated by the fact that its potential consumers could not afford the technology. The availability of micro-lending to help defray the upfront costs of cleaner, more efficient energy technology has removed that barrier. Further, such micro-lending facilities for poor energy consumers should be instrumental to energy suppliers in building up a market that justifies the investment in developing decentralized sales and service networks.

As demonstrated by this study, initiatives for fostering the development of micro-lending for energy consumers in each of the four countries can come from any of the stakeholders, as long as they collaborate with other key players. The URJA Project of SEWA Bank and SELCO demonstrated a highly successful collaborative energy-lending project. The RERED Project of Sri Lanka and AEPC/BSP of Nepal showed how governments and donors can promote energy lending by MFIs. The Solar Industry Association in Sri Lanka urged solar companies to contribute to an enabling environment by soliciting government policy and support for a strong market for the photovoltaic industry. Further, NGOs such as Winrock International (Nepal), Energy Forum (Sri Lanka), and GERES (Cambodia), represent the active role NGOs can play in promoting energy lending for poor consumers.

6.8 OPPORTUNITIES FOR CITI FOUNDATION AND OTHER DONORS

Donors and other organizations with a sustainable development mission, such as Citi Foundation, may find micro-lending for energy consumers to be an effective tool that increases poor people's access to modern energy, fosters use of renewable or cleaner energy in developing countries, and improves social and economic livelihood of the poor. The most effective strategic interventions by donors are financial and technical support.

Financial support for energy lending is primarily needed to kick off a lending program and to bridge any mismatch between an MFI's loan policy and borrowers' financial capacity. This could be support that enables the bank to lower an equity financing requirement, extend the loan period beyond three years (such as for micro hydro), provide a grace period, and reduce collateral requirements. However, it should be understood that such financial support ought to be available only until an MFI reaches enough momentum where business-as-usual terms and conditions can be applied. This understanding is important to avoid potential market distortion by donors that can jeopardize the sustainability of an MFI's energy-lending program.

Financial support can be crucial when an MFI enters a business sector—such as decentralized and small scale energy solutions—that not only is new to the MFI but also to its target market and the market players. Options for donor financial support to MFIs in this case may include transaction cost sharing, credit enhancement schemes, risk mitigation schemes, and specific loan funds for financing local energy companies that adopt energy delivery models to reach potential consumers who are not bankable.

Financial support needs to be combined with strong technical assistance that has a pragmatic focus on building market infrastructure (networks that disseminate, install, and service, and reach customers' locations) and market awareness. Taking into account the challenges and baseline conditions that exist in many of the developing countries

where MFIs operate, technical assistance to help energy lending succeed include (1) developing market studies that specifically target the existing client bases of the MFIs, (2) formulating technical standards for quality products and services and requiring compliance by the energy vendors, (3) advising the MFI on the design of an energy-lending program, (4) assisting with market development activities, and (5) fostering development of the supply-chain. In many developing countries, the weakest point for scaling up energy lending program is the lack of sufficient numbers of stable energy vendors that have decentralized sales and service networks. Any MFI's energy-lending program needs to be supported with means to figure out and conquer such a challenge.

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APPENDIX 1 • FRAMEWORK OF QUESTIONS DEVELOPED FOR THE FIELD RESEARCH

This template shows the basis questions used in collecting data from each MFI and, where appropriate, from energy enterprises and clients. Based on individual country and MFI situations, and discussions with stakeholders, the questions were modified slightly by the Asia Research Consultant where appropriate.

BACKGROUND RESEARCH

1. Country Context—Macro-Level Policy and Regulation

- a. What are the overall economic and political characteristics of the country and region that impact volatility of markets (rate of inflation, growth of GDP, transition economies, conflict or political unrest, corruption, etc.)?
- b. Who are the major suppliers of financial services in country—development bank, central bank, credit unions, village banks, etc.—and what role does each play?
- c. What role do government agencies and donors play in providing support to the MFI (funding, capital, technical support, capacity building, etc.)? What role does government play in microenterprise development and how do these activities influence the environment for private microfinance—distort the market or positively contribute to the supply of services?
- d. What is the availability of and access to infrastructure (roads, communication, water and sewer systems, etc.) and social services^{1*} (health, education, and nutrition) for the MFI's client base?
- e. How do existing financial sector policies affect the provision of microfinance in country—interest rate policies, government-mandated credit allocations, legal enforcement of contractual obligations, ability to seize pledged assets, etc.?
- f. What forms of financial sector regulation exist, and are MFIs subject to these regulations? Are there minimum capital requirements to enter the financial sector? What are the standards for debt versus equity (degree of leverage), asset quality, and liquidity?

2. Microfinance Institution Profile—Portfolio Risk, Management, Ownership and Governance, etc.

- a. What is the MFIs institutional structure—non-governmental organization (NGO), savings and credit cooperative, commercial bank, etc.?
- b. What are the characteristics of the MFI's ownership and governance—oversight of management, organizational governance and ownership structures, decentralized operational system, management efficiency and information, etc.?
- c. What are the MFI's expressed objectives (reduce poverty, empower women, create employment, encourage business development, etc.) and who is the target market (rural/urban, gender, ethnicity, caste, religion, language, etc.)?

1. * For example, the availability of education and health services greatly influences the capacity of microentrepreneurs to increase their enterprise activities.

- d. Does the MFI provide social services in addition to financial mediation, such as health, nutrition, education, and literacy training?
- e. What are the ways in which the MFI's activities are funded—government or donor funding, equity, investment funds, guarantee funds, etc.?
- f. What is the MFI's institutional capacity in terms of business planning, product development, management information systems, and financial management?
- g. Do donated funds constitute equity under current practices? Do concessional funds provided by donors constitute debt and therefore affect the leverage of the MFI?

QUESTIONS FOR MFI AND ENERGY PROVIDER

3. Loan Product Design and Lending Methodology

- a. What are the specific loan characteristics unique to lending for energy and which are more generic and found in other loans?
- b. Does the MFI use different lending methodology within the energy portfolio than other portfolios? If so, what was changed to accommodate energy-specific needs?
- c. Does the MFI offer competitive interest rates in relation to the market? What are the energy loan interest rate options? Are interest rates and fees transparent and well documented?
- d. Do loan officers require additional training to be able to administer energy loans? If so, what kind of training?
- e. How robust is the accounting and administration of the lending portfolio? Is it computer or manually administered?
- f. When and how are lending portfolio analyzed? What criteria are used in the analyses, and are new programs subject to different analyses than established programs? Is the energy lending program analyzed separately from other programs?
- g. Are there other specialized end-use loans in their overall lending portfolio? What are the general criteria for adding a new type of loan?
- h. What kind of market research was done in preparation for establishing the energy lending program? What was determined to be the size of market demand for energy lending?
- i. Was the energy lending program initiated based on a demand for such a loan? Were other loans serving energy consumers insufficiently? If so, how?
- j. Are the energy loans subsidized in any way, and if so, by whom?
- k. How was the energy loan interest rate determined?
- l. Is the MFI partnering with an energy entrepreneur to provide the needed technology and operation and maintenance?
- m. What is the energy loan methodology—i.e. does the MFI provide credit for the purchase of energy technologies or does the MFI provide the capital directly to the client? How is the energy loan provided—individual lending, group solidarity lending, etc.?

4. Characteristics of Energy Loans

- a. Client demographic data: sex, age, household income, savings, residential population density, family size.
- b. What is the average cash pattern and debt capacity for energy-loan clients? Is there a minimal equity requirement for the energy loan?
- c. What is the energy loan cost structure—financing costs, operating costs, cost of capital, etc.? Are there any other fees or services charges?
- d. Does the MFI's accounting system record depreciation on energy-related capital? If so, how is it determined?
- e. What are the end-uses of energy loans? Is energy product used a consumer product or productive uses (i.e., income generation) or both? What types of technologies are used and how? How large are the installations? (in watts)
- f. Is there a correlation between clients seeking energy loans and other types of loans? For example, are energy loans often preceded by other types of loans such as housing or small business loans? Conversely, do clients who begin with energy loans progress to other types of loans such as small business loans?
- g. How much of the total lending portfolio does the energy lending program constitute? What is the financial performance of the energy lending program?
- h. What is the profitability, total outstanding balance, repayment rate of the energy program?
- i. Does the energy lending program include reliable and capable operations and maintenance support for clients? If so, who provides this service?

5. Impact Assessment of the Energy Program or Product

- a. How does the MFI currently determine who is being reached by microfinance services and track how these services are affecting their lives?
- b. If the energy loan is provided in the form of cash rather than capital, does the MFI track how the loans are spent? If so, how does the MFI staff track this?
- c. Are there identifiable reasons why borrowers may not accurately report how they are using the loan—embarrassment, fear of taxation, not wanting others to know about the loan, etc.?
- d. What are the direct and indirect impacts of the program on individuals' livelihoods and quality of life (economic, sociopolitical, psychological, physical health, etc.) on both the household and individual levels? Have these impacts been measured before, during, and after the initiation of financial services?
- e. What impacts have been observed on household income, assets, education, health, housing, and community participation?
- f. What methodologies were used to quantify these impacts? What is the socio-economic target market of the energy lending program? Who is being served? Is this the intended market for the energy loan?

6. Interactions among MFI, Energy Enterprises, and Customers

- a. What information does the MFI provide to potential customers and what is the content and process by which a lending relationship proceeds?
- b. What information does a customer need and receive from an MFI and what information and actions occur before and during a lending relationship?
- c. What is the process and information through which a customer and an energy enterprise become introduced? What information does the enterprise exchange with the customer? What information is exchanged concerning the programs of the energy enterprise?
- d. How does the energy enterprise interact with the MFI? What information does it provide?
- e. Where MFIs finance energy enterprises directly (rather than just for consumer / customer loans), what is the basis of this relationship? What is the status and type of program being offered by the MFI? What are the terms and experience base? What is the history of these relationships?
- f. Sales and Marketing—does the MFI have a sales and marketing or business development services (BDS) department? If so, how does the BDS staff go about marketing the energy product? How do they mentor and support clients and businesses in general and those that are energy-related, in particular?

QUESTIONS FOR THE CLIENTS

- a. What are the energy needs of the household (cooking, lighting, heating, etc.) per day? How many people live in the household?
- b. When did you buy the improved energy product? At what cost?
- c. Is this the 1st, 2nd, 3rd, etc improved energy product you've bought? If a repeat buyer, did you buy from same or different MFI (s). If so, why?
- d. What were you using before you acquired the improved energy product? Why did you choose to switch? Since you acquired the new product, do you only use the new/improved product or both (i.e., used both old and new)?
- e. How did you learn about the types of energy technologies available in the market? Who trained you on the operation and maintenance of the product you bought? If trained, how have you benefited from the training? If not trained, what problems have you experienced and how did you solve them? Would you be interested in receiving training? What is your willingness to pay for such training?
- f. What other non-energy products have you bought in the last 2-3 yrs and at what cost? Which ones did you buy cash and which ones via MF credit? Before your MFI created the energy product, were you aware such improved energy technologies were available in the market? Were you planning to buy such energy products? Why didn't you buy the energy product without credit?
- g. Did the MFI give you cash to buy the energy product or did the MFI supply the actual product? If MFI or its partner supplied the product, is it exactly what you wanted? Does it match your needs? If given a choice, would you rather receive cash and buy the product yourself or receive the product from the MFI? What are the advantages/disadvantages of each approach?
- h. Are there other energy products you would want but are not currently offered by your MFI? If so, what are they?

OTHER IMPORTANT INFORMATION

To enable us calculate the Cost-Recovery Factor (CRF) for improved/modern energy products, the following data is needed:

- a. Technology type (e.g., LPG, solar PV, improved wood/charcoal stove, biogas, etc)
- b. When was it bought?
- c. Capital cost:
 - i. at which it was bought with credit
 - ii. capital then without credit*
 - iii. capital now with credit
 - iv. capital now without credit (local market price if paid in cash)*
- d. Life time of the technology (yrs)
- e. Loan interest rate, country specific discount rate and annual inflation rate
- f. Energy use per family or business (in appropriate units, liters, kg, watts per unit of time).
- g. Energy price/unit, which are to be verified in the market with dealers and relevant government.

APPENDIX 2 • DETAIL OF FIELD VISITS AND RESPONDENTS

Field visits were conducted for 5–6 days. The first day was spent at the head office with the senior management team to understand the organizational structure, operations, loan products, systems, and policies of the MFI. The second and third days were at branch offices, meeting with operational staff and clients. The fourth day had meetings with different energy and microfinance stakeholders to appraise the partnership between MFI and energy service provider and gain a thorough understanding of the country’s energy sector. The fifth day was spent completing the data collection, seeking clarifications, and presenting the findings of the field research to the MFI management staff. In some cases, the order of meetings was different due to the availability of different stakeholders.

Detail of Field Visits and Respondents

	INDIA	SRI LANKA	NEPAL	CAMBODIA
MFI	SEWA CEO, general manager, and staff overseeing energy lending at the home office; operational staff including extension counter staff and banksaathis*	SEEDS deputy banking director and field manager at home office, plus operational staff including deputy managers of Ratnapura and Kegalle branches	NUBL executive director, general manager, internal auditor, planning and human resource department; operational staff at Belatari and Tadi branches	General manager, heads of marketing and communications, IT, MIS, operations, human resources, inspection and finance departments
Energy Stakeholders	CEO of SELCO	Shell Solar, Suryavahini, Solar Industries Association, HPI, DFCC/ Renewable Energy for Rural Economic Development (RERED), Energy Forum	Regional Biogas Co-ordination Committee, Alternative Energy Promotion Centre (AEPCC), Biogas Sector Partnership (BSP), and 4 biogas companies	World Bank, Énergies Renouvelables Environnement at Solidarités (GERES), Ministry of Industry, Mines, and Energy (MIME), New Energy Group, Biogas Digester Program, battery and diesel generator shops
Other MFIs		Ceylinco Leasing	Paschimanchal Grameen Bikas Bank and Pragatish-eel Women Co-operative	Maxima Microfinance
Clients	Four end-user energy clients and one energy entrepreneur	4 clients with solar loans in Ratnapura and 5 clients with grid connection loans in Kegalle District	5 clients in Belatari branch and 10 clients in Tadi branch	2 clients in Kampong Tralach District: 1 rural electricity enterprise (REE) and another battery charging station

* SEWA Bank has a team of banksaathis to serve its clients—a cadre of community financial assistants, who aid in collecting cash, informing women about SEWA Bank and its products, and winning people’s confidence. They are paid a commission for this work, based on the cash they collect. <http://www.sewabank.org/activities/index.htm>

APPENDIX 3 • RESEARCH METHODOLOGY

OBJECTIVE OF THE STUDY

The study aims to document the opportunities, challenges, costs and effects of integrating energy products into an MFI's product mix, develop feed back for future expansions of MFIs energy lending products, and share the lessons learned with the industry at large.

THE FRAMEWORK

The research study covers three stakeholders—MFI, clients and energy suppliers, and the research covers the following aspects:

Microfinance Institution (MFI)

1. Ownership, governance and strategy, products offered, microfinance policies and management systems, funding sources

Ownership, governance and strategy includes ownership structure, quality, and appropriateness of the board composition; its role and overall organizational strategy; adequacy of management oversight; organizational structure; and financial depth.

Management systems include quality of human resources; the strength of critical systems, such as accounting and management information; security and internal controls; portfolio tracking; and financial planning and control.
2. Financial performance requires the team to review existing financial statements, based on internationally accepted prudential norms, to present a fair picture of the energy operations. The team used this information to assess the energy loan portfolio's performance through various indicators, including productivity and efficiency ratios, financial viability, portfolio quality, profitability ratios, etc.
3. Impact assessment used past research and the MFI's system to identify impacts

Impact included direct and indirect impacts on individuals' livelihoods and quality of life (economic, sociopolitical, psychological, physical health, etc.) at both household and individual levels; impact on household income, assets, education, health, and housing, and community participation. The team also examined existing performance indicators and procedures for monitoring and evaluating the development impacts of energy loan products.
4. Details of collaborations covered were energy suppliers, terms and conditions of contract, experience of working with energy suppliers, other energy suppliers and energy products available in the market. The team also examined the rationale for the energy product's design—how the collateral requirements, loan pricing, repayment terms, and effective rates were determined.
5. Specifics of energy loan product(s) were target group, energy client profile, lending methodology, product design, technology used, energy delivery model, end uses of energy loans, portfolio tracking, funding sources, risk mitigation strategy, external collaborations, trainings, marketing strategy, etc.

Clients

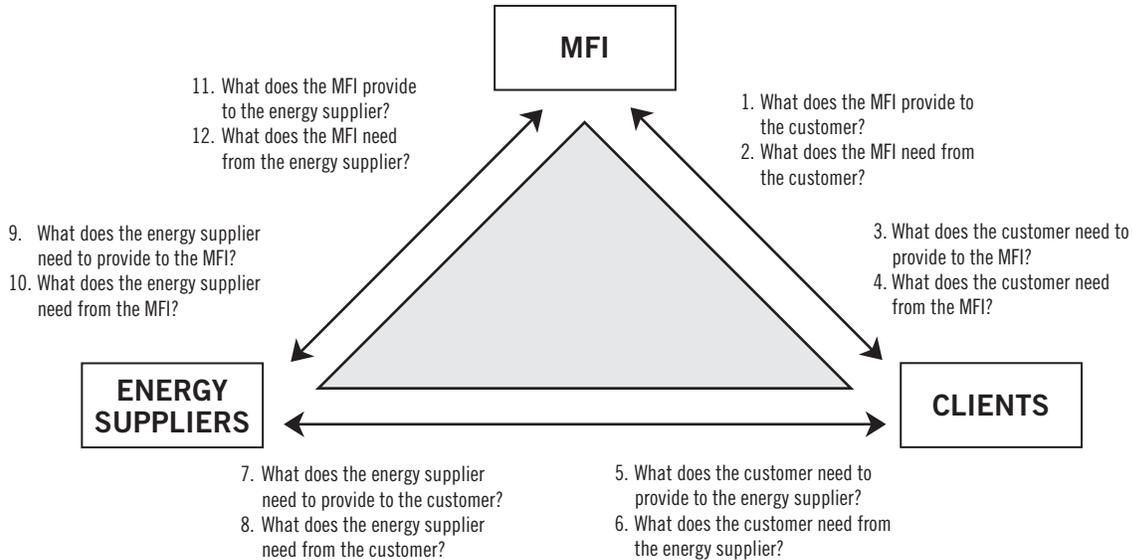
1. Identify impacts on household and individuals livelihoods/quality of life
2. Identify and understand the pattern of energy product usage in past and present
3. Identify past, current and future energy needs of the clients
4. Understand client cash flows, willingness to pay for energy services, knowledge and understanding of energy technology/products, training provided in operation of energy technology, benefit derived from energy products
5. Identify any problems they faced in managing energy loans (if any)
6. Determine details of interactions between client and energy supplier
7. Understand how clients learned about the energy product (existing or repeat loan customer, marketing and outreach, etc.)

Energy Suppliers

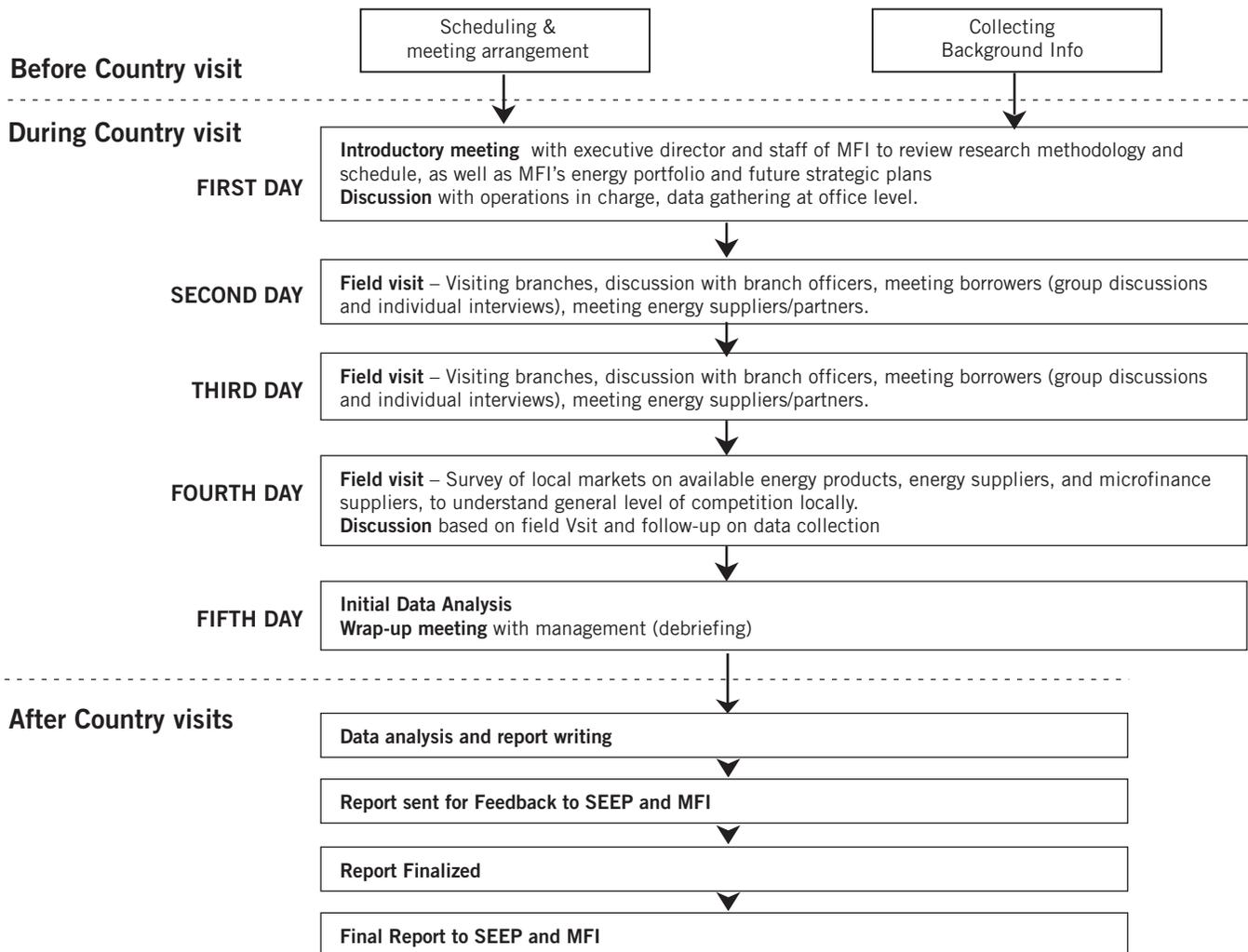
1. Examine details of contract with MFI, direct sales and after sales service provided to clients, details of interactions with MFI and client.
2. Examine details of the delivery model adopted to service the clients.
3. Look at the rationale for technology selections to be included into MFI energy lending products.
4. Determine what market infrastructure was available to the clients
5. Review marketing and outreaching strategy
6. Analyze constraints and opportunities in working with MFIs

The team also surveyed local markets to build understanding of all energy products offered and the general level of competition in both the microfinance and energy sectors.

Relationships Among the Three Stakeholders



PROCESS



Note: The days spent in MFI may extend from 4-5 days based on the scale of microfinance lending in energy sector.

APPENDIX 4 • ROLE AND REGULATION OF FINANCIAL INSTITUTIONS IN INDIA

BANKS		NON-BANK FINANCIAL COMPANIES			CO-OPERATIVES and CREDIT UNIONS				NON-PROFIT INSTITUTIONS
Commercial Banks	Local Area Banks	Regional Rural Banks	Primary Urban Co-operative Banks	State and Central Co-operative Banks	State and Primary Co-operative Rural Development Banks	Primary Agriculture Credit Societies	Mutually Aided Co-operative Societies	Self-Help Groups	
Participation in financial sector	Commercial lending, 40% of net bank credit to priority sector	Unsecured lending limited to 15% of total advances	Equipment leasing, hire purchase, loan and investment co-ops	At least 60% credit in priority lending areas	Short-term lending to rural areas	Long-term lending to rural areas	Rural credit delivery and technical assistance	Rural credit delivery	NGOs: MF lending and other charitable services Co-ops: MF lending for business and housing
Legal basis for regulating	RBI Act, 1934; Banking Regulation Act, 1949	Banking Regulation Act, 1934; Banking Regulation Act, 1949	RBI Act, 1934	Banking Regulation Act, 1949	Banking Regulation Act, 1949	Banking Regulation Act, 1949	Constitution of India, Schedule VII	Andhra Pradesh MACS Act	NGOs: Society Registration Act, 1860/ Indian Trust Act Co-ops: Companies Act 1956
Regulator	RBI	NABARD	RBI	NABARD	RBI, Urban Banks Dept.	NABARD	Interstate cooperatives	State registrar, but has limited powers	NGOs: Not regulated Co-ops: Registrar of companies
Capital and reserves	Initially INR 2 billion (US\$ 45.2 million), which must increase to INR 3 billion (US\$ 67.7 million) within 3 years of operation	Authorized capital of INR 10 million (US\$ 225,800)	INR 20 million (US\$ 451,600) for NBFCs that commenced business after 21 April 1999; INR 2.5 million (US\$ 56,500) otherwise	Minimum INR 100,000 (US\$ 2,260), consistent with of paid-up capital and reserves					

APPENDIX 5 • ROLE AND REGULATION OF FINANCIAL INSTITUTIONS IN SRI LANKA

	COMMERCIAL BANKS	DEVELOPMENT BANKS (DBs)	FINANCING COMPANIES	FINGOS	LICENSED CO-OPERATIVES	UNLICENSED MFIS
Participation in financial market	Commercial lending, lending to MFIs to satisfy the 3% required lending to the underserved sector, and priority sector lending requirement	Agricultural sector; national priority industries, and poorer households (mainly women)	Individual consumers and small businesses	Poor members of society who lack access to credit services	Low-income individuals, can provide financial services to both non-members and 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; Co-operative Act 1992; Financial Intermediary Societies Act, 1998	SACCOs: Societies Registration Act; Cooperatives Act, 1992 NGOs: Societies Registration Act; Social Welfare Act, 1991
Regulator	NRB	NRB	NRB	NRB	Ministry of Agriculture, Dept. of Co-operatives, and NRB	Ministry of Agriculture, Department of Co-operatives
Capital and reserves	Class A financial institutions (FIs)—national banks with head office in Katmandu Valley: NR 1 billion (US\$ 14 million); banks outside Katmandu Valley: NR 250 million (US\$ 3.5 million)	DBs (Class B FI)—national DBs: NR 320 million (US\$ 4.5 million); DBs operating in 4–10 districts (excluding Katmandu Valley): NR 50 million (US\$ 0.7 million); DBs operating in 1–3 districts (excluding Katmandu Valley): NR 20 million (US\$ 0.3 million) Microfinance development banks (Class D FIs)—national MFDBs: NR 100 million (US\$ 1.4 million); MFDBs operating outside of Katmandu Valley: NR 60 million (US\$ 0.85 million); MFDBs operating in 4–10 districts (excluding Katmandu Valley): NR 20 million (US\$ 0.3 million); MFDBs operating in 1–3 districts (excluding Katmandu Valley): NR 10 million (US\$ 0.15 million)	Class C financial institutions (FIs)—national FIs (general): NR 50 million (US\$ 0.7 million); national FIs (leasing companies): NR 150 million (US\$ 2.1 million); FIs operating in 1 district only (general): NR 20 million (US\$ 0.3 million); FIs operating in 1 district only (for districts in mid-western or far western regions): NR 10 million (US\$ 0.15 million)	Not stated	Operations in Metropolitan District: NR 10 million (US\$ 0.15 million); operations in sub-metropolitan district NR: 5 million (US\$ 71,000); operations in municipal district: NR 2.5 million (US\$ 35,400); Operations in other districts: NR 1 million (US\$ 15,000)	N/A

APPENDIX 6 • ROLE AND REGULATION OF FINANCIAL INSTITUTIONS IN NEPAL

	COMMERCIAL BANKS	DEVELOPMENT BANKS (DBs)	FINANCING COMPANIES	FINGOS	LICENSED CO-OPERATIVES	UNLICENSED MFIS
Participation in financial market	Commercial lending, lending to MFIs (to satisfy the 3% lending to the unserved 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 Intermediary Societies Act (1998)	Nepal Rastra Bank Act (2002), Sec 79; Cooperatives Act (1992); Financial Intermediary Societies Act (1998)	- SACCOs: Societies Registration Act; Co-operatives Act (1992) - NGOs: Societies Registration Act; Social Welfare Act (1991)
Regulator	NRB	NRB	NRB	NRB	Ministry of Agriculture, Department of Co-operatives, and NRB	Ministry of Agriculture, Department of Co-operatives
Capital and reserves	<i>Class A financial institutions</i> - National banks with head offices in Katmandu Valley: NR 1 billion (US\$ 14 million) - Banks outside Katmandu Valley: NR 250 million (US\$ 3.5 million)	<i>Development banks (DBs), Class B FI</i> - National DBs: NR 320 million (US\$ 4.5 million) - DBs operating in 4–10 districts (excluding Katmandu Valley): NR 50 million (US\$ 0.7 million) - DBs operating in 1–3 districts (excluding Katmandu Valley): NR 20 million (US\$ 0.3 million) Microfinance development banks (MFDBs), Class D FIs - National MFDBs: NR 100 million (US\$ 1.4 million); - MFDBs operating Outside of Katmandu Valley: NR 60 million (US\$ 0.85 million) - MFDBs operating in 4–10 districts (excluding Katmandu Valley): NR 20 million (US\$ 0.3 million) - MFDBs operating in 1–3 districts (excluding Katmandu Valley): NR 10 million (US\$ 0.15 million)	<i>Class C financial institutions (FIs)</i> - National FIs (general): NR 50 million (US\$ 0.7 million) - National FIs (leasing companies): NR 150 million (US\$ 2.1 million) FIs Operating in 1 district only (general): NR 20 million (US\$ 0.3 million) FIs Operating in 1 district only (for districts in mid-western or far-western regions): NR 10 million (US\$ 0.15 million)	Not stated	- Operations in Metropolitan district: NR 10 million (US\$ 0.15 million) - Operations in Sub-metropolitan district: NR 5 million (US\$ 71,000) - Operations in Municipal district: NR 2.5 million (US\$ 35,400) - Operations in other districts: NR 1 million (US\$ 15,000)	N/A

APPENDIX 7 • SUMMARY OF RESEARCH FINDINGS AND THE COMPARATIVE FEATURES OF THE MFIS STUDIED

Establishment of Energy Lending Finance

	SEWA BANK	SEEDS	NUBL	AMRET*
Starting year	2006	1999	2005	Not specified
Energy lending initiator	Self-initiated	Solar loan initiated by parent organization (Sarvodaya); Grid loans by ADB, and village hydro by RERED	Initially started by government loan fund for biogas micro-lending	Not relevant: energy lending part of business loan product
Energy program characteristics	- One-stop energy shop - Customized products	Doorstep energy solutions	Doorstep energy solutions	N/A

Energy Products

	SEWA BANK	SEEDS	NUBL	AMRET*
Energy products offered	PV-SHS/battery charging, solar lantern, improved cookstove, sarai cooker*	SHS, grid connection, village hydro scheme	Domestic biogas plant	
Product characteristic	Demand-driven, technologically neutral	Designated options for energy products	Designated energy product (thus far only single product)	No bank intervention on energy product/ technology selection by clients
Product innovation	Proactively carried out internally in collaboration with energy partner, to explore better energy solutions for clients	Subject to product trends introduced by government/donor	Subject to external intervention (e.g., donor, government, NGO)	

* A sarai cooker is a non-pressurized stainless steel steam cooker that uses about 150 ml of water heated by 100 g of charcoal briquettes. The cooker heats three cook pots (stacked one on top of the other) on all sides, not just the bottom. Boiling and evaporation tests show about 70% efficiency. "ARTI develops a novel biogas plant," update, *Good News India*, June 1, 2004, <http://www.goodnewsindia.com/index.php/Supplement/article/294/>.

Services

	SEWA BANK	SEEDS	NUBL	AMRET
After-sale service	Free maintenance and operation during warranty period by the vendor	- SHS: After-sale service by solar companies based on MOU with SEEDS - Grid connection loans: N/A - Micro hydro: Based on MOU between ECS* and equipment supplier	Free within warranty period by the biogas companies	Based on warranty period of diesel generator and battery purchased
Training	Training by vendor at the time of installation and to potential clients during business and financial counseling	- SHS: Training at the time of installation by solar company - Micro hydro: Developer's responsibility	Formal one day training by company after construction	Not applicable

* Electricity co-operative society

Risk Management for Energy Lending

	SEWA BANK	SEEDS	NUBL	AMRET
Technical risk management	<ul style="list-style-type: none"> - Technical risk covered by SELCO - Buy-back option by SELCO within 5 years 	<ul style="list-style-type: none"> - SHS: (1) Enforcement of World Bank RERED Project Standards; (2) MOU with solar companies; (3) 5% of the loan used as savings deposit from small companies to cover contingencies - Grid: NA - Village hydro: no initiative by SEEDS 	Not available	Not applicable
Credit risk management	Follow-up by commissioned agents	<ul style="list-style-type: none"> - SHS: (1) MOU with solar companies to remove solar panels from the house of the client in case of default; SEEDS retains ownership until loan is repaid; (2) internal insurance fund; (3) MOU with company for buy-back option in case grid connection becomes available - Grid: Affidavit with Ceylon Electricity Board (CEB) to disconnect grid connection in case of default - Micro hydro: Peer pressure through ECS members 	Not available	Not applicable
Other unique features	<ul style="list-style-type: none"> - Energy need pre-assessment by vendor for client - Initiated with a 15 day equipment trial period, before the loan sanction 	<ul style="list-style-type: none"> - SHS: Client energy need pre-assessment by solar company; preliminary loan appraisal by vendor - Grid: Cost estimates by CEB for grid connection - Micro hydro: Complete project management by "developer" 	Cost estimates/price quotation by biogas company prior to loan approval	Not applicable

Loan Portfolio

	SEWA BANK	SEEDS	NUBL	AMRET*
No. of energy clients (at time of research)	SHS – 28 Solar lantern – 66 Sarai cooker – 630	SHS – 58,000 Grid connection – 3692 Village grid – 14 ECS	Biogas plants – 65	707 business owners: 101 of these businesses are battery charging services
Total no. of loans disbursed	94 loans, with total value of INR 641,992 as of August 2006	Over 58,000 solar loans; 3,692 grid loans; and 14 village hydro scheme loans, with total value of LKR 955.1 million as of August 2006	65 loans, with total value of NRs 975,000 as of October 2006	707 loans, with total value of 354 million Riel as of June 2006.
Energy portfolio against bank's overall portfolio	Less than 1% of total portfolio as of August 2006	Constitutes 30.8% of total microfinance portfolio as of June 2006	Less than 1% of total portfolio as of September 2006	0.7% of total microfinance portfolio as of June 2006
Portfolio quality	Energy lending: 0% PAR > 0 days	Energy lending: 35% PAR >60 days (as of June 2006)	Energy lending: 0% PAR > 0 days	Energy lending: 0% PAR > 0 days
Profitability and sustainability	N/A since the program is new	ROA of 1.5% as of 31 March 2006	N/A since the program is new	N/A, since the energy portfolio not accounted for separately

Relations with Energy Suppliers

	SEWA BANK	SEEDS	NUBL	AMRET*
Relations Charac-teristic	<i>Exclusive collaboration</i> with SELCO to develop and implement one stop energy shop that pro-vides wide selections of better energy products together with credit line. Both parties invest their resources to establish and promote URJA Project.	<ul style="list-style-type: none"> - SHS: <i>Non-exclusive</i> MOUs with SHS suppliers to ensure quality deliverables to its clients. - Village grid: SEEDS does not maintain contact with equipment suppliers. ECS enters into MOU directly with the assistance of project developers. - Grid connection: Collaboration with CEB as the provider of grid electricity 	Due to favorable policy environment and high quality control maintained by biogas sector partnership (BSP), MFIs such as NUBL do not enter into special MOUs with the biogas companies.	Since energy loans fall under general business loans, AMRET thus far has not maintained any contact with energy suppliers.
Scope of energy partner's role	<ul style="list-style-type: none"> - Conducts energy needs survey; explores improved technology options; and customizes products if required. - Provides training (product knowledge) to SEWA Bank staff and clients - Jointly with bank, promotes URJA Project. - Installs and uninstalls systems for 15-day product trial at clients' premises. - Final installation, provides warranty, and after-sale services 	<ul style="list-style-type: none"> - SHS: Promotes SEEDS' SHS loan; identifies and scouts potential customers; installs the system; provides users' trainings; provides warranty and after-sale services. - Village grid: Project developer does site selection, social mobilization, feasibility study, secures approvals, assists ECS in mobilizing funds and selecting suppliers, assists ECS in exploring productive use of electricity generated. - Grid connection: CEB markets SEEDS loan product to potential clients visiting its office, provides cost estimate, and installs grid connection. 	Biogas company is expected to participate in market awareness building and biogas loan promotion, scout potential clients, refer them to NUBL, provide cost estimates, construct and install system, provide clients with user manuals, submit post-completion report to NUBL for payment disbursement, as well as provide warranty and after-sale service.	Energy suppliers are expected to interact directly with clients, with no intervention whatsoever from AMRET.

Market Development

	SEWA BANK	SEEDS	NUBL	AMRET*
Ap-proach by MFIs	Proactive role in promoting energy products and loans, beyond its core business of microfinance, using existing infrastructure and events of the bank	The SHS, village hydro, and grid loan products are promoted mainly by companies, project developers, and CEB, respectively. SEEDS loan officers also promote the products during field visits.	NUBL does market awareness and promotes its biogas loans during center meetings. From time to time, it also invites biogas companies to attend these center meetings. However, efforts have not been fully successful due to lack of adequate coordination between MFIs and biogas companies.	No specific marketing and outreach activities carried out by AMRET for energy loans, as they do not have any special energy lending product as of now.
Role of external parties	<ul style="list-style-type: none"> - Energy Partner: The active participation of SELCO is key to the success of URJA Project, not only during the market awareness trainings, but also during the one-to-one consultancy provided to prospective clients and willingness to provide product trial. - Donor institutions: The Lemelson Foundation (USA) has provided funding for market awareness, capacity building, and promotion of energy enterprises. 	Energy lending in Sri Lanka is mostly driven by government and donor interventions, either under RERED or other initiatives, such as the ADB-supported grid-connection loan. In addition, the role of SHS suppliers, village hydro project developers, and CEB has been of key importance.	<ul style="list-style-type: none"> - Biogas Support Program (BSP) interventions on marketing, creating awareness, and maintaining quality are instrumental for the success of biogas loan in Nepal. - Winrock International focuses on building an enabling business ecosystem by building up capacity of various stakeholders. - 60 registered biogas companies have strong decentralized sales and service networks (> 200 branches). 	Efforts are being made by sector facilitators, such as Ministry of Industry, Mines, and Energy; and the Biodigester National Program, to promote alternative energy. However, integration between energy and microfinance sectors is still missing due to their inadequate knowledge of other sectors.

Management Capacity

	SEWA BANK	SEEDS	NUBL	AMRET*
Administration and management	<ul style="list-style-type: none"> - Energy division at HO - No separate energy staff at field level - 200 SEWA staff members trained by SELCO 	<ul style="list-style-type: none"> - Separate energy division - Separate energy staff at field level - Staff trained by solar companies, ADB, and Energy Forum in Sri Lanka 	<ul style="list-style-type: none"> - No separate energy division/staff - NUBL staff trained by Winrock, Nepal. 	<ul style="list-style-type: none"> - No specific energy product, is part of general business loan
Accounts and MIS	<ul style="list-style-type: none"> - Software: Windows-based integrated modules of accounts, MIS, and client data - Energy portfolio quality analysis report (can be generated daily) - Repayment tracking mechanism at all levels except collection agents 	<ul style="list-style-type: none"> - Software: Installation in progress (specifically for energy program) - Energy portfolio quality analysis in Microsoft Excel (monthly) - Financial performance of energy program, not analyzed separately (balance sheet not prepared) 	<ul style="list-style-type: none"> - Software: Oracle-based integrated modules of client data, accounts, MIS, and HR (performing well) - Portfolio quality analysis (weekly) - Profitability analysis (monthly, branch-wide) 	<ul style="list-style-type: none"> - Software: Accounts with MIS (performing well) - Portfolio quality analysis (monthly)
Microfinance portfolio management	<ul style="list-style-type: none"> - Loan product featured 35 months and monthly repayment - Flexible repayment mechanism followed—bound to reflect an overall low portfolio quality. However, energy loan portfolio, being new, had 100% repayment rate. 	<ul style="list-style-type: none"> - Portfolio quality tracked at all levels - Follow up and enforcement of credit discipline weak - Repayment problem due to unexpected grid line extension in areas with SHS loans 	<ul style="list-style-type: none"> - Portfolio quality suffered due to political disturbances and faulty incentive policy in the past. - Energy loan portfolio was small and had 100% repayment. 	<ul style="list-style-type: none"> - Good client selection and loan appraisal process - Prompt follow up on loans - High credit discipline
Business planning	<ul style="list-style-type: none"> - Structured mechanism for monitoring investments and compliance with liquidity norms of RBI - Has a low credit deposit ratio of around 35%, reflecting low deployment of funds in productive asset, i.e., portfolio 	<ul style="list-style-type: none"> - Weak financial and business planning, not based on past trends and realistic assumptions - High idle cash (34%) reflects inadequate financial planning and management's conservative approach to lending due to weak portfolio quality. 	<ul style="list-style-type: none"> - Well structured and participative business planning process - Implements budgetary control mechanism by linking branch expenses with branch profitability 	<ul style="list-style-type: none"> - Well structured and participative business planning process - Variance analysis on a monthly basis
Internal audit	<ul style="list-style-type: none"> - Inadequate frequency and rigor - Flexible repayments require stricter controls. There have been cases of fraud in the past. 	<ul style="list-style-type: none"> - Financial audit is inadequate while policy and operational audit are absent. - Weak monitoring by branch senior staff. 	<ul style="list-style-type: none"> - Internal audit department is understaffed. As a result, frequency of audits is low. - Have other control mechanisms, such as rotation of field staff throughout centers, compulsory 10-day leave for branch manager, etc. 	<ul style="list-style-type: none"> - Internal audit department is understaffed. As a result, frequency of audits is low. - Have faced several cases of minor fraud.

Impact Profile

	SEWA BANK	SEEDS	NUBL	AMRET*
Economic	<ul style="list-style-type: none"> - Solar lantern: Saves 15-30% compared to baseline kerosene light. In addition, due to better quality lights, hawkers can attract more customers. - SHS: After loan term, clients enjoy free light until the end of SHS life cycle. - Photovoltaic battery charging unit: On each unit, clients and business owners earn a net profit of INR 3,105 in 1st year, INR 3,550 in 2nd year, and INR 6,260 after loan term through life time of unit. - Sarai cooker: Reduce cooking cost to INR 1/day for a 4-member family (compared to LPG that costs INR 8–11/day) - Annapurna smokeless stove*: Reduces fuel consumption by 30–50% 	<p>On average, modern lighting from SEEDS energy lending enables household clients to reduce kerosene consumption by 15–30 liters per month, costing LKR 720–1,440.</p> <p>- No specific data on income generating analysis, except that 565 of SEEDS photovoltaic (PV) and SHS clients are productive use customers.</p>	<p>On average, biogas clients save between NR 150–1,000 per month compared to their baseline expenditure. In addition, slurry (high nutrient fertilizer) from biogas processing, gives clients higher yields while replacing chemical fertilizers.</p>	<p>The AMRET credit facility has enabled rural energy enterprises to emerge and provide energy services to rural people (who had no access to grid) as well as help them scale up production. Specifically on energy services, clients on average enjoy monthly revenue of US\$ 100–500, depending on their capacity.</p>
Health	<p>Fumeless and accident-free lighting; cleaner indoor conditions; meals retain more nutritional value; and cooking drudgery is reduced</p>	<p>Modern lighting allows clients to have cleaner indoor conditions.</p>	<p>- Clients claimed to have no eye or skin irritation and cleaner indoor conditions.</p>	<p>Improved indoor conditions due to shift from kerosene to village electricity</p>
Social	<ul style="list-style-type: none"> - SHS clients claimed to have better social standing after having modern lighting in their home. - The PV-battery-charging business of one owner enabled him to send his child to engineering school from profits. - Sarai cooker gives user to have more free time. 	<p>Modern lighting enables clients and family to have TV, more access to information, and children have longer study time at night.</p>	<p>- Clients claimed that biogas helps to reduce drudgery of cooking especially for those whose baseline energy source for cooking is fuel wood.</p>	<p>Helps end-consumers have better and reliable electricity source, which helps children to extend their study time.</p>
Environment	<p>Utilizations of new energy products will reduce carbon emission through change to fuel oil as the most common baseline lighting source and more efficient use (smaller amount) of fuel wood as the most common baseline for cooking.</p>	<p>Total installed PV of 2,360 kW and village hydro of 77 kW, kerosene consumption reduced by 16–19 million liters/year and carbon emissions reduced by 40-47 thousands CO₂e</p>	<p>Biogas plants offer an alternative to fuel wood, and avoids methane gas resulting from fuel pellets made from cattle dung.</p>	<p>No environmental impact so far because all energy clients are using fuel-oil power generators.</p>

*The Annapurna smokeless stove burns up to 50% less fuel wood (or biomass fuel) and vents smoke outside through a chimney. It can be made from inexpensive, locally available materials (concrete/mud bricks, tin cans, metal rods). The metal version has three burners and a water tank for continuous hot water. See Rural Integrated Development Services-Nepal, "Smokeless Metal Stoves," http://www.rids-nepal.org/index.php?option=com_content&task=view&id=82&Itemid=115.

APPENDIX 8 • INITIAL STAGES AND ESTABLISHMENT OF ENERGY LENDING OF SEWA BANK, SEEDS, NUBL, AND AMRET

SEWA BANK

SEWA Bank began providing energy products and loans in 1997 with ENSIGNE project through which it disbursed 121 energy loans in and around Ahmedabad City. The loans were disbursed based on a study of the energy needs of SEWA Bank members and ways to improve the energy solutions. After ENSIGNE, in collaboration with Mahila Housing Trust, SEWA Bank continued to provide energy loans under its UJALA (“light”) scheme, which provided a credit facility for connection to the electricity grid to households located in urban slums. Under this program, SEWA Bank collaborated with Ahmedabad Electricity Company. The program was discontinued when AEC realized its potential and started its own credit facility for electricity connection.

In 2001, with UNOPS support, SEWA studied the demand for micro-lending for energy products. In May 2004, SEWA Bank staff heard a presentation by SELCO (an energy service company specializing in catering to poor energy consumers), during a meeting held by the Global Village Energy Project (GVEP) in Manila. After the meeting, SEWA and SELCO began communicating, leading to SEWA Bank staff and clients visiting Karnataka, where SELCO has a very strong sales and service network. The visit was followed by field research by SELCO in Ahmedabad to assess the energy needs of SEWA Bank clients. Upon learning the similarity of mission and client profile, SEWA and SELCO soon entered into a partnership arrangement for exploring, developing, and implementing energy products and loans in Gujarat, and in April 2006, the URJA project was launched as a joint initiative.

SEEDS

SEEDS began its energy program with solar home systems in 1999. Sarvodaya opened a separate unit, Sarvodaya Rural Technical Service (SRTS), to promote SHS in rural areas. SRTS initiated its total service energy program in two districts, but quickly realized that the model was inefficient and unsustainable. At this point, SEEDS took over the energy-lending portfolio of SRTS. It entered into an agreement with Shell Solar and defined roles whereby SEEDS acted as financier and Shell provided marketing and sales.

As SEEDS expanded energy lending to other branches, it was invited by the World Bank to become a Participatory Credit Institution (PCI) under the RERED project. As a PCI of RERED, SEEDS received loan funds to provide energy loans to its clients.

With village micro hydro schemes, SEEDS was not sure initially how to initiate micro hydro loans. However, the successful implementation of micro hydro projects by Hatton National Bank and the eagerness of project managers led to SEEDS’ offering village hydro lending in 2005. Grid-connection loans were started in 2006, based on ADB’s research on the potential of grid loans and the availability of revolving loan fund support.

NUBL

NUBL’s initial initiative in introducing biogas loans in 2002 was encouraged by provision of loan funds from AEPC, which gave NUBL NR 2.5 million for energy lending. However, in the next two years, NUBL was not able to utilize the funds and managed to install only one biogas plant. NUBL realized that the product did not take off because clients did not want loans with collateral (one of the prerequisites for energy loans). Later, with the help of Winrock, NUBL began energy lending again in September 2004, using its own funds and modified loan terms.

AMRET

AMRET does not offer a separate energy product to its clients. Presently, its energy lending is treated as an individual business loan product. The business loans can be used for any income-generating activity. AMRET has made around 707 such business loans to purchase equipment to provide electricity, set up battery charger services, or to help reduce high energy consumption of productive activities.

APPENDIX 9 • AMRET’S OUTSTANDING LOAN FUNDS AND GRANTS

LOAN FUNDS	OUTSTANDING DEBT (KHR '000')	OUTSTANDING DEBT (US\$)	INTEREST RATE PER ANNUM
Microfinance Alliance Fund	1,773,700	426,575	11.6%
Dexia Bank	2,286,900	550,000	5.5% + Libor 6 months
Triodos Doen - Hivos	6,200,000	1,491,101	11.5%
Triodos Doen - Hivos	2,079,000	500,000	9.0%
National Bank of Cambodia	7,520,000	1,808,561	6.0%
NBC AFD	7,500,000	1,803,571	6.0%
Calvert Foundation	2,079,000	500,000	7.5%
Sicav-Nord-Sud Dev.	2,079,000	500,000	2% + Libor 3 months
I & P Development	3,136,240	754,266	13.37%
Rural Development Bank	2,000,000	481,000	6% + Libor 6 months
OPEC	6,237,000	1,500,000	3.5% + Libor 6 months
Oikocredit Foundation	5,200,000	1,250,601	12.8%
Total	48,090,840	11,565,675	
GRANTS	AMOUNT (KHR)	AMOUNT (US\$)	
Microfinance Alliance Fund	166,320,000	40,000	
AFD	282,299,000	67,893	
CGAP	311,850,000	75,000	
USAID	83,160,000	20,000	
Total	843,629,000	202,893	