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# Expanding the Role of Microfinance in Promoting Renewable Energy Access in Developing Countries

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*While developing country governments acknowledge that a clean environment is vital for long-term economic sustainability, limited resources create a necessary policy tradeoff between environmental protection and economic development. A promising area for policy action where such tradeoffs may be reduced or eliminated is in renewable energy technologies. As these technologies have become cheap and reliable in recent years they can reduce pollution and also help promote economic growth in developing countries by providing increased access to energy. Technologies such as solar, small-scale hydro, wind and biodiesel have the comparative advantage of reaching off-grid, rural areas where most people in developing countries live. Once poor countries gain access to reliable sources of energy, they can then address complex issues like poverty and climate change with energy as a tool to combat such issues. This article proposes a new way in which developing countries may provide leadership by expanding the role of microfinance initiatives to finance renewable power generation and distribution and describes how developed countries can assist the process.*

Even in the 21st century, a third of the world's population, about 2.4 billion people in the developing world, live without modern energy supplies and about 1.6 billion have no electricity (United Nations-Energy). In sub-Saharan Africa alone more than 80 percent of the population does not have access to energy. Absent new policies, in 2030 1.4 billion people will still lack access to energy (International Energy Outlook 2004). Reliable and affordable energy services are increasingly recognized as a prerequisite for economic development and environmental protection. If people in developing countries lack access to energy, and energy is fundamental to generating income, securing food supplies, and

availing healthcare services, how can developing country governments be expected to prioritize environmental protection or address larger challenges like global climate change?

Thanks to the availability of renewable energy technologies, efforts in this century to meet new energy demands can be accompanied by the reduction of environmental impacts of energy use. By adopting these technologies through innovative microfinance strategies, developing countries can protect the environment even as they grow their economies.

Renewable energy technologies such as small-scale hydro, solar photovoltaics (PV), wind and biodiesel have the advantage of

being able to serve remote, rural areas where a majority of developing country populations live. This is because these technologies are not reliant on a central electricity grid for distribution. Renewable energy technologies are able to operate via stand-alone, decentralized or mini-grid applications. Due to this flexibility, renewable energy technologies are increasing in popularity in some developing countries. For example, at the end of 2003, northern and eastern China had 180,000 small off-grid windmills with a total capacity of 35 MW supplying local users (Ye 2005). In rural areas of Malaysia, palm oil mills use biomass waste to generate off-grid electric power.

The advantage of renewable energy technologies in connecting under-served populations and therefore generating economic growth

could provide a strong impetus for developing country governments to promote the use of such technologies in coming years. However, if adequate financing mechanisms are absent, people in the developing world can ill-afford renewable energy technologies.

Going forward, leaders in developing countries should explore new policy instruments to expand the use of renewable energy and at the same time make gradual efforts to replace nonrenewable, non-environment-friendly energy with renewable energy. The logic is provided both by the improvement in the welfare of remote, under-served populations and by the perilous environmental effects of fossil fuel combustion. For developing countries the stakes of environmental

pollution are much higher than for developed nations. Developing countries are ill-equipped to handle the severe health consequences of pollution, the loss of millions of dollars caused by fossil fuel price shocks, environmental degradation and catastrophic weather events that could result from global warming.

#### THE ROLE OF MICROFINANCE IN SUPPORTING RENEWABLE ENERGY

Rapid advancements in renewable energy technologies

since the oil price crises of the 1970s have led to substantially reduced costs for renewable power. For example, solar and wind power costs are now half of what they were about 15 years ago (REN21 2005). In addition, adequate investment in some areas of

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developing countries has made power from renewable energy more competitive with power from conventional energy sources. Consider the case of Sagar Island in north-eastern India where the cost of electricity from solar photo-voltaic power plants is the equivalent of 24 US cents per kwh while the cost of power from large diesel generators is the equivalent of 33 US cents per kwh (Parthasarathi 2005). But renewable energy still accounts for a mere three percent of global electric power.

Why have renewable energy technologies not been more widely adopted? In large part it is due to the prohibitive costs of modernizing age-old energy supply infrastructure which were designed to transmit

power generated from fossil fuels like oil, coal and gas. The lack of renewable energy infrastructure makes initial capital costs of renewable power projects significant. In the case of wind power in India, initial costs make up about 90 percent of the total cost, according to Dr. Anil Kane of the Indian Wind Energy Association (Devi 2005).

An effective way for the governments of developing countries to reduce these initial costs, as well as offset the costs of renewable energy distribution, is through microfinance initiatives. Microfinance is a system of providing small loans at favorable interest rates in order to initiate specific types of economic activity.

Microfinance can facilitate both the "push" and the "pull" of renewable energy technologies in developing country markets. It can enable a push mechanism by financing installation costs of renewable energy technologies, as well as generate a pull mechanism by financing energy distribution to consumers and industry.

Public finance and development institutions in some countries have already been employing microfinance schemes to stimulate renewable power generation. The Indian Renewable Energy Development Agency and Nepal's Alternative Energy Promotion Centre, which operates under its Ministry of Science and Technology, are examples where micro-loans are provided to developers of biogas plants, micro-hydropower and solar photovoltaic systems.

Microfinance also has the potential to expand renewable energy distribution by making the energy systems more affordable. Micro-finance institutions (MFIs) are well-positioned to do so because they are able to offer flexible loans and structure their lending schemes and financial products in accordance with the needs of the poor. For example, they are able to tie loan repayment rates to seasonal energy needs, or to seasonal variations in rural household and industry

income.

Innovative partnerships have already emerged between renewable energy generators and MFIs to support distribution to rural populations. In Haiti, for example, microfinance leaders Fonkoze and Green Microfinance have partnered with a local solar energy vendor to design and test a solar loan product for lending to rural micro-enterprises (Green Microfinance). It is estimated that 100 Haitian micro-enterprises will benefit from this initiative. The Solar Electric Light Company (SELCO), which is based in India is yet another example of an innovative partnership between a renewable energy service provider and MFIs. SELCO provides solar energy systems and servicing to local consumers and businesses while their partner MFIs offer affordable pricing.

Developing countries need to take further steps to ensure that renewable energy continues to expand. Governments should specify national targets for including renewables in their energy mix as well as targets for serving off-grid populations. In addition they should provide incentives for private MFIs to support renewable energy generation and commercialization. To complement these efforts, governments must also enhance the knowledge base of MFIs about renewable power projects, and decentralize efforts to implement renewable energy projects by government agencies.

#### **POLICY GOALS FOR DEVELOPING COUNTRIES**

In order to expand renewable energy access, developing country governments should undertake six measures.

##### **Set renewable energy generation and access targets**

The first step for developing countries is to set targets, both for renewable energy generation as well as for the extension of energy access to larger numbers of people.

National targets are essential to securing long-term investment in renewable energy. For example, in the Philippines President Arroyo is currently supporting legislation that would require all energy generating companies to source a percentage of their power supply from renewable energy sources. Most developing countries also have yet to set meaningful targets for the numbers of people they want to extend energy access to within a specified timeline.

While renewable energy targets need to be integrated into national energy policies, energy markets need to be kept open to independent power producers with the ability to invest in renewable power projects.

#### **Encourage the role of the private sector in development of renewable energy**

The majority of support for renewable energy technologies in developing countries comes from local and state governments or from foreign donors. This is not sustainable because government funds fluctuate as priorities shift and as national and regional crises spring up from time to time. The flows of aid from foreign donors can also ebb at times.

Developing country governments should create an enabling policy environment that encourages their private sector to participate in financing the development of renewable energy projects. This would help create a sustainable renewable power industry, generate profits and create jobs as well as increase efficiency in financing. One way to get private MFIs involved is by setting up "matching fund programs" whereby private micro-loans towards supporting renewable energy generation are matched by governments funds.

#### **Expand the reach of renewable energy technologies**

Public-private arrangements modeled on a matching funds scheme should be set

up to expand the distribution of renewable energy. Private micro-loans matched by government funds can be provided at favorable interest rates to consumers and industry who purchase renewable energy systems. Consumer oriented microfinance programs in some countries have already made renewable energy competitive with traditional fuels. For example, 30-month financing schemes provided by MFIs in Andean villages make the monthly costs of solar cells roughly comparable to the cost of non-environmentally friendly kerosene lamps and candles, which are common sources of lighting in rural areas of developing countries (Brown 2003).

Governments must also ensure that all financing schemes for renewable energy are "technology neutral". Currently the majority of microfinance institutions support rural household electrification projects. While home electrification has undeniable social benefits as well as income generating capabilities, a predominant focus on these projects can cause rural economies to gravitate unconditionally towards "cottage industries." Lending schemes should be more open-ended and flexible enough to support a variety of energy applications that generally support economic productivity, health and safety.

#### **Train microfinance leaders to understand the renewable energy business**

One of the barriers to renewable energy finance is the lack of knowledge about the renewable power business by financial institutions (Martinot 2004). In order to design financial products for renewable energy generation, microfinance institutions need to gain a deeper understanding of renewable energy industry.

For example, certain renewable power equipment with a resale value, such as wind turbines and solar panels, can be used as collateral, whereas other equipment, such as

transmissions cables, cannot because they have no resale value. MFIs also need to be able to determine the rate of depreciation of energy technologies when granting loans. Developing country governments should provide grants to renewable power generators and distributors to design training programs for MFIs that would help them gain more knowledge about the renewable energy business.

### **Promote renewable energy demonstration schemes**

Governments should support renewable energy demonstration projects because these projects spread information about the potential of renewable energy in rural areas. Just as U.S. development agencies are commissioning successful African vanilla farmers to teach others how to farm vanilla, developing country governments should initiate programs where outstanding renewable energy generators can demonstrate to others the successes of their trade (Demonstrating Patience 2004).

In poor areas with little to no access to information technologies such as television or internet, the principles of "show and tell", whereby individuals or groups give live demonstrations of their activities and explain best practices, are especially valuable in helping people replicate good business models.

### **Decentralize the implementation of renewable energy projects**

Governments in developing countries would benefit from giving individual economic sectors, authority over how to deploy renewable energy technologies within public service projects. For example, ministries of education, health, and water should ideally be guiding the implementation of renewable energy within their sectors rather than waiting for the guidance of federal energy authorities. In many poor countries, the

switch to renewable energy technologies is being slowed by the centralized control of energy authorities over all renewable energy applications in public projects.

In addition, government must create an enabling environment for the involvement of multiple stakeholders in the implementation of renewable energy, including provincial governments and local communities. A decentralized approach that mobilizes con-

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sultation with all stakeholders will ensure that needs and expectations are expressed and the most suitable energy solutions are explored. In China, a number of individual ministries and local governments have set up agencies for rural energy promotion under their jurisdiction and charged them to work with local communities to popularize the use of small hydro-power, solar and biogas. Similarly, decentralization of the energy planning structures in Sri Lanka have led to significant improvements in rural electrification and helped rural access to electricity rise from 44 percent in 1990 to 63 percent in 2000 (Wickramasinghe 2004).

### **CONCLUSION**

While developing countries acknowledge that environmental protection is vital for development, their limited resources often present a tradeoff in the policy arena. Renewable energy technologies offer a way

to balance the two. These technologies can help meet energy demands in areas currently not connected to central electricity grids, provide opportunities for economic development, protect developing countries from fossil fuel price shocks, as well as reduce atmospheric emissions. Renewable energy is thus a major force for the advancement of people in developing countries who account for 80 percent of the world's population but consume only 30 percent of global commercial energy.

Microfinance institutions offer a promising way to bridge the energy gap because they can offset the high costs that are cur-

rently paralyzing the expansion of renewable energy generation. In addition, microfinance can spur the commercialization of renewable energy technologies by making them more affordable to consumers and industry.

Developing countries should also set national targets for the adoption of renewable energy, facilitate the cooperation of microfinance institutions, renewable energy developers and distributors, enhance understanding between renewable power developers and MFIs, and decentralize bureaucracies that slow the implementation of renewable energy projects.

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