



Overcoming obstacles against effective solar lighting interventions in South Asia

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ARTICLE INFO

Article history:

Received 29 November 2009

Accepted 1 September 2010

Available online 25 October 2010

Keywords:

Solar lighting

World Bank

South Asia

ABSTRACT

Basing on our devised World Bank's 'Design Principles' for effective renewable energy projects in developing countries and an in-depth analysis of our two solar lighting projects in Bangladesh and India, this paper explores three key obstacles that constrain poor people from obtaining solar lighting: financial exclusion, weak governance, and passive NGO and customer participation. The low take-up rate has a social and psychological impact. This paper recommends creating easy access to credit, establishing a robust complaint system, and developing strategic partnership to overcome the obstacles.

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1. Introduction

The World Bank has been, and will continue to be, an influential player in shaping renewable energy policies in developing countries. It has spent US\$11 billion on renewable energy since 1990 (World Bank, 2008a: 10). The rate of financing new renewable energy and energy efficiency schemes increases by an average of 30% per year (World Bank, 2009a: 9). 2.5 million homes in the developing world are now linked to solar lighting as a result (World Bank, 2008a: 8). After working on the ground for decades, the Bank has accumulated huge experience about what makes renewable energy projects work and what does not. Lessons drawn from the Bank's policies and strategies, therefore, merit great attention.

This paper focuses on the World Bank's 'Design Principles' for renewable energy projects in developing countries. The three key elements of the Design Principles are: getting the prices, the institutions and the contexts right. The first principle touches on cost management: making renewable energy cheap in order to widen access. The second principle stresses good governance: strengthening institutions to ensure effective delivery of renewable energy services in a transparent and accountable manner. The third principle underlines the appropriate choice of technology that meets local needs. However, the World Bank has never actually used the term 'Design Principles'; we derive it from the Bank's ten key policy documents and publications over energy (e.g. World Bank, 2009a, 2008a), infrastructure (e.g. World Bank, 2008b), climate change (e.g. World Bank, 2008c), and poverty reduction (e.g. World Bank, 2000). (The criteria for selecting these

publications for deriving the concept will be discussed in next section.)

These Design Principles offer a clear understanding of the key factors affecting effective implementation of renewable energy projects in developing countries. We use the Design Principles as a reference point and guide to analyse two solar lighting projects in South Asia. These are an individual solar home system in Bangladesh and a solar lantern system in India. They are both off-grid, small-scale interventions for poorly served rural populations.

In this paper, we will analyse the project designs and the implementation process of these case studies, and highlight three key obstacles that constrain poor people from obtaining solar lighting: firstly, financial exclusion: poor people cannot afford to own or rent solar light systems because of the heavy down-payment and monthly subscription. Using universal subsidy policies to reduce costs creates unfairness and benefits only the non-poor. Secondly, weak governance: a lack of both robust monitoring and efficient technical support reduces service quality and leads to the break-down of the self-regulatory relationships between customers and service providers. Thirdly, passive participation: customers and NGOs are not involved in the decision-making process of the project designs, and they do not feel a sense of ownership of the projects. Our study will suggest that solar lighting's selective take-up rate adds a new layer of social divides in the communities, between those who could afford the solar lighting and those could not.

To overcome the obstacles, we will make a number of recommendations. Innovative financial arrangements, such as providing easy access to credit, are promoted to create financial inclusion. Increasing transparency about how rules are made and the setting up of a sound complaint system to monitor services could achieve governance strengthening. Genuine partnership is

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developed to engage NGOs and customers at the early stage of project design to promote ownership.

This paper will first outline the rationality and strategies of the World Bank's 'Design Principles' for renewable energy projects in developing countries. It will then discuss the qualitative research methodology that guides the selection of the case studies and the research process. Highlighting the background, implementation process and outcomes of the two solar lighting projects in South Asia, the next section will explore the obstacles that hinder effective solar lighting interventions, such as cost management, social influences, governance and participation, and technical support. It will conclude with recommendations that help overcome the obstacles.

2. Design Principles

It is estimated that 1.6 billion poor people are denied access to clean and reliable energy (World Bank, 2008a: 8). How to address such a grave scale of energy poverty, by making renewable energy affordable and attractive, has become one of the biggest challenges to the World Bank. In its recent energy strategy consultation paper, the Bank asks: 'what are the ways in which the [energy] strategy's focus on the poor could be enhanced?' (World Bank, 2009b: 8).

We have closely examined the World Bank's policy documents and publications over renewable energy and related issues, and derived the World Bank's 'Design Principles' for achieving

effective renewable energy projects in developing countries. The reasons why we coin this phrase are that: the World Bank has been working closely with developing countries over renewable energy for decades, and there are some lessons we can learn from the Bank's experience and engagement. The three key elements of the Design Principles, summarised in Table 1, aim to provide policy-makers, NGOs and practitioners with some ideas about what factors shape effective renewable energy projects. The Design Principles can be interpreted as the favourable conditions which need to be created, before the projects are started, in order to enhance the access to clean technology for the poor. The Design Principles are not prescriptions for 'sure-win' interventions. They lay stress on context specificity and allow flexibility, and their relevance is subject to local circumstances and the nature of the interventions.

There is a need to stress that the World Bank does not use the phrase 'Design Principles' in its documentations; we derive it from the Bank's ten key documents touching on issues, such as renewable energy and energy efficiency (2009a, 2008a, 2007, 2006, 1999), infrastructure (2008b), climate change (2008c), and energy-poverty links (2004, 2001, 2000), published over the past decade. The criteria to select the literature are based on their relevance, significance and year of publication. The literature shows a strong consistency of the Bank's positioning and strategies in renewable energy. We provide detailed sources of the literature to enhance our research validity. We are aware that the Bank has proposed the 'Framework for the Energy Strategy' in its recent energy consultation document

Table 1

The World Bank's 'Design Principles' for effective renewable energy projects in developing countries.

Source: Our own table, derived from World Bank publications.

Principles	Rationality	Strategies
(1) Cost effectiveness: getting the prices right	<ul style="list-style-type: none"> ● Price is the primary determinant of fuel switching, so reducing the end-user prices of renewable energy is crucial (World Bank, 2009a: 1) ● Produce a level-playing field for renewable energy since existing energy market is distorted by heavy subsidies on non-renewable fuels (World Bank, 2000: 103) 	<ul style="list-style-type: none"> ● To reduce the market prices of renewable energy by continuous technological improvement (World Bank, 2009a: 10) ● To improve efficiency by competition and by providing more energy suppliers (World Bank, 2001, quoted in World Bank, 2009a: 5) ● To fill the investment gaps by attracting more investments from the private sector and by introducing the user-pays principles (World Bank, 2006: 20) ● To promote innovative financial arrangements to make access to credits easier (World Bank, 2000: 5) ● To provide more and better information for fuel-switching (World Bank, 2008a:21) ● To remove broad-based subsidies and to promote the principle of 'subsidising connection, not consumption' to increase clean energy penetration (World Bank, 2000:103)
(2) Good governance: getting the institutions right	<ul style="list-style-type: none"> ● Sound and credible regulatory and monitoring structures provide clear and predictable signals to customers and service providers, and that improves management efficiency and quality of services (World Bank, 2008b: 14). 	<ul style="list-style-type: none"> ● To decentralise decision-making process (World Bank, 2008a:10) ● To enhance transparency and accountability to foster trust and to combat corruption (World Bank, 2009a: 18) ● To develop clearly defined commercial mechanisms between renewable energy service providers and customers (World Bank, 2000: 3) ● To strengthen voices of consumers and communities by public participation (World Bank, 2006: 17) ● To promote public-private partnership in investment, monitoring and service provision (World Bank, 2008b: 13; World Bank, 2009a, World Bank, 2009b:11)
(3) Appropriate technology: getting the contexts right	<ul style="list-style-type: none"> ● Renewable energy innovations work better if meeting local conditions and priorities (World Bank, 2000: 105) 	<ul style="list-style-type: none"> ● To locate clean technology where renewable energy resources are available and plentiful (World Bank, 2008a: 10) ● To tailor services to meet requirements of poor communities and households (World Bank, 2008b: 4)

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