

Renewable energy investment by the World Bank

Eric Martinot*

Stockholm Environment Institute—Boston, 11 Arlington St., Boston, MA 02116, USA

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Abstract

World Bank Group lending for renewable energy accelerated in the 1990s and resulted in 17 approved projects with \$700 million in Bank loans and \$230 million in grants by the Global Environment Facility. The Bank's 1999 energy-sector strategy *Fuel for Thought* charted new directions for renewable energy investment. The present paper considers the implementation challenges of *Fuel for Thought* strategies and the opportunities for carrying them out. The paper distinguishes between agendas in the energy and rural-development sectors, and reviews limitations to implementing these agendas. Lessons from projects are just emerging, but suggest five areas of support for renewable energy by the Bank in the future: renewable energy financing, electric power policy frameworks, rural energy enterprises, regulated rural energy concessions, and domestic technology manufacturing. Interviews with the private sector suggest additional forms of support: assist with business plans, finance pre-feasibility studies, reduce commercial risks, support joint ventures, build market volume and stability, and pilot and test innovative business models. The effectiveness of the Bank in following through on its ambitious agenda fundamentally rests on the willingness and commitment of developing countries to pursue these strategies and the degree to which renewable energy applications are seen to serve countries' development priorities. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

World Bank Group lending for renewable energy projects in developing countries accelerated during the 1990s as a confluence of development, environment and social factors began to convince the Bank and its client countries that renewable energy projects were viable investments.¹ By 1999, assisted by grants from the Global Environment Facility (GEF), the Bank had approved 17 renewable energy projects with a total cost of \$3.2 billion, which includes Bank loans and credits of \$700 million and GEF co-financing of \$230 million. An additional 13 projects had been awarded about \$210 million in grants by the GEF but not yet approved by the Bank (see the appendix for a description of the Bank's renewable energy project portfolio).

* The research underlying this paper was conducted when the author was an Associate of the Stockholm Environment Institute—Boston. He now works for the Global Environment Facility.

E-mail address: emartinot@worldbank.org (E. Martinot).

¹ The term "Bank" refers to the World Bank Group throughout the paper. The term "renewable energy" refers to solar, wind, biomass, geothermal and mini-hydro technology applications; large-scale hydropower is excluded.

Three milestones stand out in the evolution of renewable energy within the Bank during the 1990s. In 1992, the Bank established the Asia Alternative Energy Program (ASTAE) to bring renewable energy and energy efficiency into the Bank's power sector lending in Asia.² Funded primarily from outside the Bank by bilateral donors and other partners, ASTAE greatly facilitated preparation and implementation of a broad portfolio of renewable energy projects and activities throughout Asia. ASTAE experts also assisted with renewable energy projects in other operating regions of the Bank and were able to boost renewable energy activity by enabling Bank task managers to proceed with greater confidence in developing the new project approaches demanded by renewable energy and in working with new local country counterparts.

In 1996, the Bank published *Rural Energy and Development: Improving Energy Supplies for Two Billion People* (World Bank, 1996a). This small book emphasized the connection between energy services and rural poverty alleviation. It highlighted the fact that two billion people

² For more information see www.worldbank.org/astae.

still lack access to modern energy services like electricity. This book, and the work that preceded it, helped to launch preparation of more than 10 Bank projects for providing energy services to rural populations lacking access to electricity, through the use of solar photovoltaics and other renewables (see appendix for a review of the early studies). This book outlined an 8-point action plan for broadening energy access in rural areas, including a greater emphasis on rural energy throughout the Bank and a new rural energy initiative for Africa.

In 1999, the World Bank board of directors adopted a sector-strategy paper entitled *Fuel for Thought: Environmental Strategy for the Energy Sector*. This paper promised to promote energy sector reform that makes renewables more competitive with conventional energy sources (often called “leveling the playing field”). It also promised to promote renewable energy projects “as mainstream activities where they are cost-effective solutions to energy and environmental priorities” and to “expand support for the identification and preparation of renewable energy ... projects” (World Bank, 1999a, p. 35).

Fuel for Thought also proposed a new “strategic partnership” with the GEF for renewable energy. The proposed strategies under this partnership recognized the experimental, iterative and time-intensive nature of effective models and strategies, along with the need for rapid response to private sector proposals. Four key features of the proposed program were: (a) *adaptable program loans* to provide long-term policy and investment programs (up to 10 years) in a particular country with flexible tranches and adjustable designs; (b) *policy tools* that facilitate supportive regulatory frameworks for grid-connected renewable energy in developing countries; (c) a *rapid response envelope* to allow quick investment decisions on private-sector opportunities meeting pre-agreed criteria; and (d) *country-based intermediaries* to identify and appraise projects. As an interim target, the Bank proposed \$150 million annually in GEF resources combined with \$600 million per year from the Bank and other sources. This commitment was far larger than historic lending patterns.

Although the emerging renewable energy project portfolio and the plans in the 1996 paper and in *Fuel for Thought* are laudable, the prospects for renewable energy investments by the Bank are still uncertain. What challenges does the Bank face in continuing to finance renewable energy investments in its client countries? What are the strategic opportunities for carrying out an ambitious renewable energy program, particularly in partnership with the private sector? Interviews conducted by the author with Bank task managers, private-sector renewable energy firms, and energy/environment researchers and advocates, combined with emerging project experiences from Bank projects, help to address these ques-

tions. This paper is based partly on a series of interviews conducted during 1998 and 1999 while the author worked as a consultant for the Environment Department of the World Bank. Nevertheless, the views expressed are strictly those of the author and do not necessarily reflect the views of the World Bank Group or any of its client governments.

2. Agendas for renewable energy investment by the Bank

Renewable energy and environmental advocates have often encouraged the Bank to lend more for renewables (Kozloff and Shobowale, 1994; Flavin and Tunali, 1996; Flavin, 1997; Institute for Policy Studies, 1998; PCAST, 1999).³ Typical was the US President’s Committee on Science and Technology (PCAST) 1999 report, which called upon multilateral development banks to begin a transition “from conventional technologies to supporting clean technologies” (p. 3–36). While this report did not call for specific targets, others have advocated targets like 15% of total Bank energy-sector lending devoted to renewable energy. These “supply-side” views see the Bank in a position to supply greater aggregate amounts of investment capital and other assistance for renewable energy projects in the energy sector.

The “supply-side” agenda of renewable energy and environmental advocates is often shared by technology manufacturers, R&D planners and bilateral assistance agencies pushing technology exports. These players often think of renewables by specific technology type — wind, solar, biomass, small hydro. Together with environmental advocates, their agendas may include combating global climate change, expanding market opportunities for technology suppliers in developing countries, and stimulating technology advances and cost reductions engendered by greater technology deployment.

A common response to the “supply-side” view is that client countries must be willing to borrow for renewables before the Bank can lend — the “demand side” of the equation. This means countries must understand the costs and benefits of renewable energy technologies and their potential to solve the most pressing development problems before they are willing to borrow, say Bank managers. “Borrower commitment” is constrained by lack of familiarity with renewable energy technologies, lack of understanding of the costs and benefits and

³ During the 1990s, renewable energy markets in developed countries accelerated rapidly as renewables became competitive with conventional energy supplies in some applications and as favorable policies towards renewables were enacted — see for example Grubb (1995), Shepherd (1998), and IEA (1997, 1999). Developing countries’ experience has been more moderate but quite varied in the range of applications and experiences — see for example Goldemberg and Johansson (1995), Ramana (1997), and ESMAP (2000a, b).

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