

# Solar Development Group

The Solar Development Group (SDG), a \$41-million initiative, was created with the goal of increasing the delivery of SHS to rural households in developing countries. Comprised of two separate entities, Solar Development Capital (SDC) and the Solar Development Foundation (SDF), SDG provided financing to private sector companies involved in rural solar PV activities in developing countries, as well as grants for business development services.

## BACKGROUND

Motivated by the enthusiasm about the potential for rural solar PV electrification exhibited by those involved in the solar PV industry during the mid-1990s, the charitable foundation community in the United States saw an opportunity to engage with the WBG. In early 1996, a letter was sent from the Rockefeller Foundation (on behalf of a number of members of the charitable foundation community) to Jim Wolfensohn, then president of the WBG, proposing the creation of a solar energy investment subsidiary.

The proposal called for the injection of “massive” amounts of money to launch the emerging market solar PV industry, through the development of an investment vehicle that would dramatically expand financing for commercial companies, so that they could develop and provide rural energy services. The vision was grand, and at the earliest stage of concept development, investing up to \$1 billion to catalyze the solar PV market was discussed.

By the end of 1996, a significantly scaled-down concept paper for a \$50-million “Solar Development Corporation” was being circulated. IFC was brought in to work on the WBG-led initiative, given its expe-

rience in private sector project finance. An external consultant, contracted in July of 1997 to develop a feasibility study and business plan, found that the solar PV market showed tremendous potential, and identified over 100 investment opportunities. In March 1999, Triodos Solar PV Partners<sup>37</sup> was appointed as advisor, and the fundraising and business planning process began.

Originally envisioned as a single entity with both financing and technical assistance components, the SDG, as the final initiative was named, consisted of two separate but closely related and supportive entities, SDF and SDC. SDF was initially proposed as a \$19.5 million NGO, offering business development and seed financing in the range of \$10,000–\$100,000 to assist solar PV companies in preparing for private investment. SDC was envisioned as a \$32 million for-profit private equity fund, providing growth capital in the range of \$100,000–\$2,000,000 for private solar PV and solar PV-related businesses in developing countries (see Table 8 for an overview of SDG, page 50).

SDG, through its two separate entities, in effect responded to two perceived problems in the market. SDC was designed in response to a view that there was a cost-effective business over the horizon, provided economies of scale could be achieved through higher volumes and greater commercial returns could be realized through lower unit costs. In turn, SDF was designed to respond to the solar PV market (with high costs and underfunded entrepreneurs) requiring more of a nonprofit model, which became known as a patient capital approach. It soon became evident that it was impossible to address both issues under one framework.

The goal was to raise a total of \$50 million from a

<sup>37</sup> A nonprofit organization, Triodos Solar PV Partners was formed by three organizations: Triodos International Fund Management (part of the Triodos Bank Group), Environmental Enterprises Assistance Fund (EEAF), and solar PV sector experts GT Consulting, Inc. (GTC), a joint venture of Soluz, Inc. and Enersol Associates, Inc.

**TABLE 8: SOLAR DEVELOPMENT GROUP AT A GLANCE**

	<b>SDF</b>	<b>SDC</b>
<b>Objective</b>	Help PV companies prepare for private investment	Provision of capital to PV-related SMEs, ESCOs, banks, microfinance institutions and leasing companies
<b>Company Type</b>	Not-for-Profit	For-profit private equity fund with venture capital elements
<b>Number of Investments Made</b>	Target: 75 enterprises in first five years Achieved: Commitments totaling over \$3.5 million in 63 projects (54 companies) \$2.2 million disbursed by early 2004	Target: 27 investments in 15 companies totaling \$18 million, including eight loans to FIs totaling \$10 million Achieved: Six investments (\$3.9 million) approved; three investments disbursed, totaling \$650,000
<b>Total Capitalization</b>	Target: \$19.5 million Achieved: \$12 million	Target: \$32 million Achieved: \$28.7 million
<b>Geographical Scope</b>	Target: Global Achieved: 23 countries	Target: Global Achieved: Three countries
<b>Type of Investment Vehicles</b>	Loans (up to four years at 0–10 percent interest in local or U.S. currency) Guarantees (to facilitate local bank lending) Technical Assistance Grants	Minority position capital investments Provision of additional debt/quasi debt
<b>Date Began Operations</b>	March 2000	April 2001
<b>Date Closed and Managing Agency Appointed</b>	March 2004 Operations transferred to the Triodos Renewable Energy for Development (TRED) Fund	April 2004 Assets sold to TRED Fund, thereby liquidating the fund

<sup>38</sup> Directorate General for International Cooperation (DGIS) of the Netherlands Ministry of Foreign Affairs, IFC, Swiss State Secretariat for Economic Affairs (SECO), and WBG.

<sup>39</sup> Cordaid, Joyce Mertz-Gilmore Foundation, Rockefeller Foundation, Rockefeller Brothers Fund, and Stichting Triodos-Doen Foundation.

<sup>40</sup> GEF, IFC, SECO.

<sup>41</sup> Cordaid and Environmental Enterprise Assistance Fund (EEAF).

<sup>42</sup> Calvert World Values International Equity Fund, Rabobank Foundation, and Triodos Bank Group.

consortium of investors and donors for SDG. Ultimately, \$41 million was raised from private sector solar PV businesses, individual private investors, NGOs, multilateral organizations, bilateral organizations, and various socially responsible investment (SRI) funds. SDF was supported, in large part, by multilateral and bilateral organizations,<sup>38</sup> as well as the charitable and NGO community.<sup>39</sup> (See Table 9 for detail on SDF shareholders, page 51.) SDC also received multilateral and bilateral support,<sup>40</sup> as well as support from AstroPower (now GE Solar), a private individual, NGOs,<sup>41</sup> and a number of SRI Funds.<sup>42</sup> (See Table 10 for detail on SDC shareholders, page 51.)

Each entity (SDC and SDF) was established with its own mandate and separate board of directors. The separation of the two entities was necessary, as previously mentioned, not only to address the two key perceived issues in the market, but also since SDG had raised funds from foundations based in the United States. These foundations enjoy a tax-exempt

status, provided they do not engage in profit-making activities, such as venture capital. As such, the charitable foundations made up much of the shareholder base for SDF, the NGO charged with the market development activities and riskier seed capital initiatives, while the SRI funds were focused on by SDC, the for-profit venture capital fund.

## IMPLEMENTATION

SDF began operations in early 2000 with \$12 million in commitments, and soon approved its first transactions. SDC concluded its fundraising phase in April 2001 at \$29 million, and approved its first investment five months later.

It soon was clear that the investment opportunities identified in the feasibility study had been grossly overstated; in fact, not one of the over 100 opportunities identified in the feasibility study ultimately received support from SDC. There was a ma-

for disconnect between where those involved in the initial structuring of SDG felt the market was and where it actually was. The market was simply not ripe for equity investments, the market assessment having overestimated the maturity of the solar PV market and the number of business opportunities. Furthermore, market conditions were changing: the Latin American and East Asian financial crises and the 9/11 attacks had an impact on emerging market economies. Neither had the solar PV market moved as expected; in fact, the cost of solar PV had actually increased rather than decreased, while the increased demand in the developed world was shifting the attention of manufacturers away from the developing world. In 2002, less than a year after SDC had begun operations, Triodos International Fund Management indicated that the existing investment guidelines were unrealistic, given the nature of the market, and that new investment guidelines were needed. These issues, consequently, resulted in lower return expectations.

Discussions on restructuring share ownership within SDC began to take place. While restructuring was necessary, the conflicting interests of the different shareholders were making it difficult to reach consensus. Those shareholders, who looked at their involvement more from a profitability standpoint, felt that the investment fund had no future and should be closed. In contrast, those, such as IFC's Environment and Social Development Department, which had a mandate to provide innovative project financing, felt that SDC should be restructured.

A revised implementation plan to expand the number of financing instruments offered by SDC

**TABLE 9. SDF SHAREHOLDERS**

SHAREHOLDER	PERCENT
World Bank	45.2
International Finance Corporation*	4.8
Global Environment Facility**	2.0
Others	48.0

\*IFC—Environment and Social Development Department.

\*\*Represented by IFC's Environment and Social Development Department.

**TABLE 10. SDC SHAREHOLDERS**

SHAREHOLDER	NUMBER OF A SHARES	NUMBER OF C SHARES	PERCENT
Global Environment Facility*	—	10,000	34.8
International Finance Corporation**	3,000	2,500	19.1
Others	11,500	1,750	46.0

\*Represented by IFC's Environment and Social Development Department.

\*\*IFC's Infrastructure Department.

and to lower the return requirements was presented to and approved by a majority of the SDC board.

The plan required larger shareholders buying out the smaller shareholders. Despite the restructuring effort, however, there were not enough viable investment opportunities, and in June 2004, only three years after it began operations, SDC was disbanded as a legal entity. Assets were sold to the Triodos Renewable Energy for Development (TRED) Fund. At the time of sale, 13 percent (\$3.6 million) of the \$29 million in funds committed to SDC had been called. Of this amount, \$650,000 was disbursed to investments; the remainder went to operational and deal-related expenses.

Amid discussions relating to the restructuring of SDC, the SDF Board of Directors solicited proposals to manage the NGO in the event SDC were to fail. In early 2004, SDF transferred operations to the TRED Fund.

## PERFORMANCE AND OUTCOMES

The SDG initiative began in 1996 and ended in 2004. During those eight years, \$2.85 million was disbursed to solar PV projects in over 20 countries. Though not quite the billion-dollar order-of-magnitude initiative that was initially called for, SDG was certainly an experience that has provided many valuable lessons for the future.

SDF, with its flexible, less risk-averse, and more affordable funding, was able to meet most of its investment objectives. SDF financing was provided to

### SUNLABOB RURAL ENERGY SYSTEM CO., LTD.

SDG had an impact on the solar PV market beyond the provision of financing. SDF developed a consumer financing handbook that provided modeling tools and guidelines for the assessment of credit risk, which has proved effective.

Sunlabob Rural Energy System Co., Ltd., used this handbook in the development of its business plan for providing affordable and reliable solar energy through rental services in Lao PDR.

The World Bank awarded Sunlabob the Development Marketplace Award in 2005 for its work in developing a rental system that makes solar electricity affordable for the majority of rural households or villages without the use of subsidies.

help create a more enabling environment, increase the amount of consumer finance available, support enterprise growth, and support innovation within the industry. Following the beliefs that the challenges facing the market were more related to marketing and consumer financing than manufacturing and wholesale distribution, that retail operations more directly benefit the rural people, and that stimulating demand at the retail level would benefit the entire industry, retail distribution made up 80 percent of the SDF portfolio.

While SDF certainly had a positive impact on the solar PV industry, the foundation was insufficiently sizable to produce the large-scale change that SDG investors had envisioned and desired. Furthermore, SDF had been envisioned to be an entity to prepare companies for SDC investment. This simply did not occur.

SDC was to have made 28 investments over a 10-year period. Between 2001 and 2003, only six investments were approved by the SDC Board of Investors, totaling \$3.9 million. Only \$650,000 was ultimately disbursed to three countries: Kenya (investment went bankrupt in early 2005), Indonesia (investment terminated prematurely subsequent to the cancellation of the World Bank solar PV subsidy program in the country), and Bolivia (investment has been moderately successful, although only half of the approved funds have been disbursed). While the SDC management took its fiduciary responsibility very seriously, the market was as yet unprepared for the equity investments SDC was looking to make and, thus, it decided not to invest in unsatisfactory deals. SDC ultimately was able to return money to some of its investors upon project closure.

Many of SDG's shareholders had environmental mandates that served as motivation for their participation in the initiative. Solar PV has been trumpeted for many reasons, but one of the primary arguments has consistently been the positive environmental impact achieved through the implementation of RE technologies and the resulting reduction in CO<sub>2</sub> emissions. Measuring the environmental impact proved difficult, however. In the case of SDG, few SHS systems were actually installed as a result of SDG investment, and it is therefore safe to assume that the environmental impact of SDG was negligible. Furthermore, SDG never set out to determine the number of solar PV systems installed as a result of SDG support; therefore, it would be impossible to determine the actual amount of CO<sub>2</sub> emissions that were displaced.

## WHAT WORKED AND WHAT DID NOT

### Shareholder Diversity Proved Problematic

Although the diversity of the different shareholders in SDG had been celebrated during the fundraising stage, it rapidly became apparent during implementation that it would be difficult to manage the various interests of such a diverse shareholder group. The separation of SDC and SDF had been designed to reflect the need to satisfy the different objectives of the for-profit investors, NGOs, and foundations (15 in total). With so diverse a composition (multilaterals, NGOs, SRIs, private individuals), SDG found it next to impossible to satisfy everyone's needs.

This is perhaps one of the greatest (non-market-related) reasons for the limited success of SDG, an issue from the very beginning.<sup>43</sup> The initial structure of SDG was designed so that SDF and SDC would provide complementary services; SDF would "prepare" companies for SDC investment. Yet, with each entity having a separate board of directors, each wound up with its own mandate, and not one single SDF investment graduated to SDC. In fact, SDF transcended on the SDC project pipeline, evolving into more of a soft financing vehicle, providing working capital rather than providing the seed capital and market development assistance originally intended. When it became apparent that the structure and investment guidelines were inappropriate, it proved impossible to reach consensus among the shareholders on the restructuring, despite a year of attempts.

### Strategic Alliances Were Not Developed

It is interesting to note that while the diversity of shareholders was difficult to manage, it also could have been used to advantage. Strategic alliances could have been developed along a number of lines. In fact, most potential investees expressed that they were equally interested in the contacts of SDG. Most solar PV companies are SMEs, often family owned, and have grown without the benefit of technical training. The opportunity to consult with solar PV sector experts was very attractive to SDG investees; however, this type of relationship between SDG shareholders and SDG investees did not materialize, given that SDG shareholders did not stay invested in the initiative long enough to cement relationships.

Along these same lines, SDG omitted to take significant advantage of its relationship with the World Bank Group and other shareholders in the creation of an enabling market environment (supportive policy and regulatory environment, avail-

<sup>43</sup> While perhaps not a direct cause of SDG's lack of profitability or overall success, the diversity of SDG shareholders forced a management structure that was not only cumbersome, but one in which the intended relationships did not materialize.

ability of end-user finance, knowledge and awareness of solar PV). Furthermore, other groups (the United Nations, for example) were also involved in solar initiatives, although there was no coordination between the different projects. An enabling environment is necessary for sector development, but it is costly and requires significant resources, as well as enthusiasm by local governments for solar PV. The regulatory and policy environment will not alter until this occurs. While the World Bank is in a position to impact and promote local government support of solar PV initiatives, this relationship was not taken advantage of by SDG.

### **Need to Focus on Market Development and Capacity Building**

Despite the fact that there was, and is, a clear need for market development and capacity building in the solar PV sector, the reality was that SDG was focused more on individual businesses. Had more attention been paid by SDF to develop the enabling environment, SDC may have found more investment opportunities, and SDG would have had a greater overall impact. Early recognition of market reality would have led to a smaller loss of funds.

Perhaps one of the greatest lessons that can be drawn from SDG is one that resulted not from a failure to achieve investment goals, but rather from the response to this failure. SDC management was quick to recognize that the initial investment criteria were too stringent, and it worked with shareholders to revise them. Rather than making bad deals, which could have jeopardized the reputations of those involved, it failed to make any deals, resulting in little investment loss. Management was correct in making this decision, providing a lesson on the merit of restraint. When it became apparent that the market could not produce opportunities that met the revised investment criteria, SDG was disbanded.

### **CONCLUSION**

SDG's initial goal was to increase the delivery of SHS to rural households in developing countries and to support the development of the solar PV market. While SDF is seen as having had a positive impact on the solar PV industry, SDC failed to accomplish any of its goals, and, overall, SDG came up short.

The two entities that made up SDG had very different experiences. SDF, the not-for-profit arm, which provided loans, guarantees, and grants, was largely able to meet its investment goals, while SDC,

the private equity fund, did not even come close. Solar PV markets simply were not mature enough for equity investments, and the family-owned nature of most solar PV SMEs further limited the possibilities for equity investment. At this stage of market development, different financing instruments and long-term patient capital was needed; SDC, with its ten-year fixed life and return expectations, could not provide this.

Like many other projects implemented around the same time, SDG grossly overestimated the market and the number of business opportunities that existed within it. In hindsight, it is easy to state that the focus of the project was too narrow, that the project should have focused on other RE technologies in addition to solar PV, and that additional financing instruments should have been provided. At the time the project was implemented, however, those involved in the industry truly did believe that the solar PV market was poised to take off. Had the solar PV sector actually performed as forecast, the SDG experience would surely have been quite different.

