



# INVESTING IN A CLIMATE FOR CHANGE

*Engaging the Finance Sector*



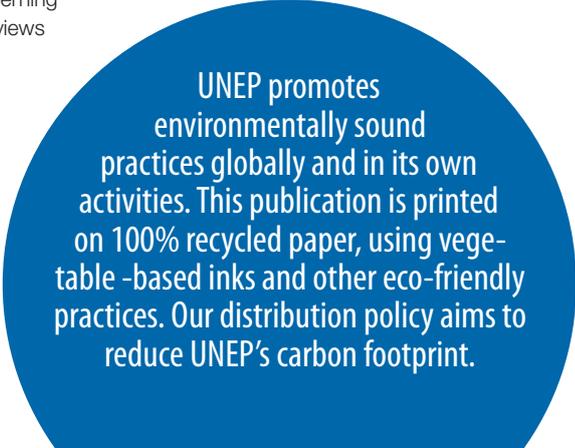
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# Investing in a Climate for Change

## Engaging the Finance Sector

### Not Just Important, Finance is Essential

Addressing the serious issue of climate change requires substantial investment in new technologies, processes and services. This investment is not just desirable, it is essential. Without substantial and sustained investment in clean energy and other measures now, the reality of a global economy free of climate change impacts will remain a distant dream.

Investment, however, requires finance in the form of equity, loans, insurance and other options. This finance ranges over a broad spectrum of needs – from conventional project finance for large multi-million dollar windfarms, to micro-credit loans for rural people to purchase efficient cookstoves. Each type of finance comes with its own set of conditions, risks, and rewards, and is generally provided by a different section of the finance community.

With a world increasingly focused on climate change, cleaner technologies are increasingly able to capture an increasing share of the huge capital investments that will be made by financiers over the coming decades to meet the world's energy needs. That share is already starting to accelerate.

Wind Energy in Tamil Nadu, India  
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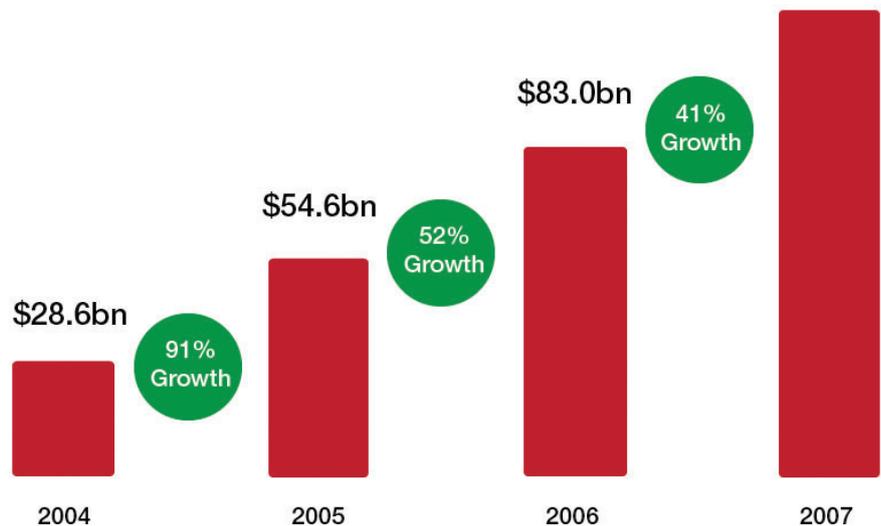


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In 2007, for example, an estimated \$117 billion was invested in the renewable energy and energy efficiency sectors, 41% higher than 2006 and more than four times the 2003 figure of \$28 billion. This investment now represents about 10% of current energy sector investment, with the wind energy sector alone securing \$29 billion in 2006 - more than any other non-fossil fuel technology, including nuclear and large hydro.

Global New Investment in Clean Energy 2004-2007 **\$117.2bn**



New investment in the sustainable energy sector reached \$117bn in 2007, an increase of 41% over 2006 and a 400% increase from 2004.

Yet, much greater levels of investment are needed.

For many applications, solar water heaters, solar photovoltaic systems, small hydro and various energy efficiency options are mature, cost-effective technologies with decreasing costs and substantial environmental and economic benefits. However, even in places with ample local renewable energy resources, markets for these technologies are still slow to develop – even with record oil prices and high costs of conventional energy.

Often the reason is simply the unavailability of an affordable loan to finance the increased upfront cost of these technologies compared to fossil-fuelled options - despite operating costs that can be substantially lower and produce significant savings over the life of the system.

Consider Tunisia, a country with a substantial solar resource. Until recently, a homeowner could get a government subsidy for liquid petroleum gas (LPG) to fuel water heaters, but no equivalent government support or bank financing for a solar water heater. This naturally made the cleaner solar option more expensive to buy and restricted growth of the market, even though the escalating cost of LPG created a substantial drain on government resources.

Courtesy Nordex

In many developing countries, promising clean energy ideas and the people who can turn them into viable businesses often need finance and business development support to take their good ideas to market. Investing in the early stages of their business development, however, carries a high risk, as the enterprise can fail.

Financial institutions may also shy away from projects, such as windfarms, if the cost of preparing and administering the first few loans is too high. Most financiers have a strong tendency to let others go first – to “do what they’ve always done” – and finance another thermal power station powered by fossil fuels, rather than something new like a windfarm.

Most financial institutions still consider sustainable energy applications as “niche” or “boutique” sectors with prohibitive market development and initial transaction costs, and are unwilling to create the new financial products the sector needs to develop. This “wait-and-see” attitude is compounded by an overall lack of information, experience and tools needed to quantify, mitigate and hedge project and product risks.

Perceiving such risks and market development costs, banks compensate with higher interest rates and more restrictive lending conditions that hinder the development of sound projects. Smaller entrepreneurs are often seen as too risky to receive any form of financing from a conventional domestic financial institution.

## UNEP and Partners: Investing in a Climate for Change

Removing investment barriers and developing markets for renewable energy and energy efficiency - together referred to as sustainable energy - is the core focus of UNEP’s sustainable energy and climate finance work. UNEP’s sustainable energy finance activities are part of an overall approach to strengthening the progression of finance needed to carry new ideas and technologies from project conception to commercial investment.

UNEP is not a bank and therefore does not directly finance projects or companies. Rather, UNEP works with a wide range of banks and other financiers to increase their support for clean energy projects. UNEP’s work is targeted at lowering market development barriers, offering small financial incentives, and building the capacities and awareness banks need to invest in the sustainable energy sector.

This work complements important activities of the development finance institutions, such as the World Bank. UNEP’s finance work fits squarely within the mission of the Division of Technology, Industry and Economics (DTIE) to help decision makers adopt policies, strategies and practices that reduce pollution and risks for human beings and the environment.



The finance sector, however, is not just an industry like others that needs to integrate environmental sustainability into their business practices. Financial institutions have traditionally played a pivotal role, fostering change and innovation in the global energy industry. Without them, investment goals remain unmet; new technology risk is poorly managed; and energy markets remain static and dominated by well-entrenched companies and institutions.

Since the late 1990s, UNEP has maintained a dual approach to promoting sustainable energy finance in developing countries. The first approach is to partner with leading, “first mover” financial institutions, helping them develop and implement new products, commercial strategies, or investment approaches. The second approach complements the first by providing broad-based support to develop and grow the sustainable energy finance industry as a whole.

UNEP’s strategy is to help strengthen the progression of finance sources needed to carry new ideas and technologies from conception through to commercial investment.

Following this progression, work is currently spread across four programme areas, including:

- Enterprise development and seed financing – helping start and nurture new companies;
- Consumer financing – helping households purchase clean energy technologies;
- Carbon finance – helping to quantify climate mitigation benefits; and
- Broad finance sector engagement – helping the rest of the industry follow the lead of the first movers;

Led by DTIE through its Renewable Energy and Finance Unit, this work is carried out in partnership with other UNEP teams and collaborating agencies, particularly the UNEP Collaborating Centre BASE ([www.energy-base.org](http://www.energy-base.org)), the UNEP Risø Centre on Energy, Climate and Sustainable Development ([www.uneprisoe.org](http://www.uneprisoe.org)) and the UNEP Finance Initiative ([www.unepfi.org](http://www.unepfi.org)).

As an implementing agency of the Global Environment Facility (GEF), UNEP brings an innovative perspective on finance to the GEF partnership. UNEP’s smaller programmes to those usually funded by major multilateral finance institutions allow testing of innovative approaches, particularly finance for renewable energy and energy efficiency.

*Helping financial institutions develop dedicated financial services is clearly one of the most efficient and “natural” ways of stimulating the growth of markets for clean energy technologies, especially in the developing world.*

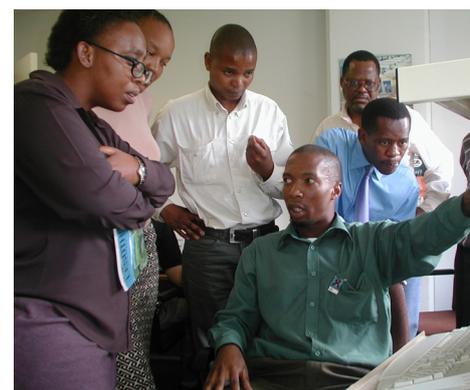
## Enterprise Development and Seed Capital

In many countries, small and medium-sized enterprises (SMEs) can be leading innovators of the new products and services needed to expand access to modern energy services with few or no emissions of greenhouse gases. Starting a new business activity, however, is a daunting task for an entrepreneur in a developing country – particularly if new technology is involved.

Although few financial institutions have the experience or desire to deal with such risky investments, this is fertile ground for capturing the entrepreneurial spirit to deliver better and cleaner energy services to millions of people. With significant backing from the UN Foundation and now the GEF, UNEP has been developing new approaches to provide early-stage or ‘seed’ finance for companies and project developers, as well as the enterprise development support they need to succeed.

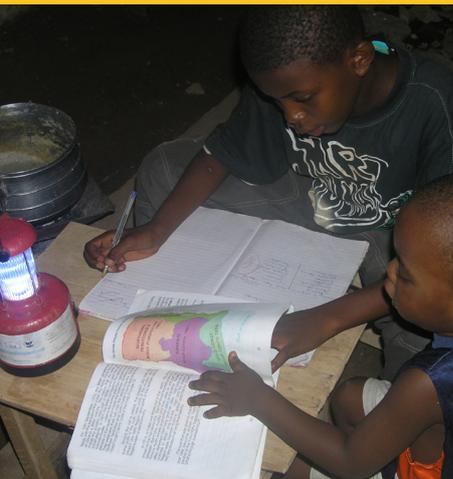
This work has involved a number of partners and institutions, ranging from the Asian and African Development Banks to specialist finance providers and local enterprise development partners.

UNEP firmly believes that assisting entrepreneurs to take risks, to innovate the way they deliver goods and services, and to continuously refine their business models, is an effective way to gain public trust while attracting commercial investment into the sustainable energy sector.



### Key Facts: Rural Energy Enterprise Development Programmes

Programme Strategy	Offer entrepreneurs a combination of enterprise development support and seed funding to set up or expand a clean energy business of project.
Geographic Coverage	Mali, Senegal, Ghana, Tanzania, Zambia, Northeast Brazil, Yunnan Province, China (plus all Asia and Africa for the new SCAF facility)
Total Budget	\$20 million (across three programmes + SCAF)
Donors	GEF (\$8.3 million), UN Foundation (\$8.5 million), Blue Moon Fund (\$0.7 million), SIDA (\$0.7 million), BMZ (\$0.4 million), Dutch Govt (\$0.2 million), Other: DBSA, Bodyshop, Domini Social Investments
Seed Fund Managers	E+Co (US 501K non-profit status – audited annually) manages seed funds and provides co-finance (\$0.5 million direct; and \$8 million indirect) for REED programmes. Commercial fund managers will provide seed finance under SCAF.
Seed fund size	\$1mn to \$5mn
Enterprise Development Costs	20 to 50 cents per dollar invested
Co-Finance	1.1 times
Leverage	Can be significant over time (e.g. E+Co has achieved 9.4 times)
Impact	Slow to produce direct impacts (job creation, GHG mitigation, etc) but can be significant in medium to long term



## Rural Energy Enterprise Development (REED).

*Using an innovative enterprise-centered approach pioneered by clean energy investor E+Co, and supported by the United Nations Foundation and others, UNEP's Rural Energy Enterprise Development (REED) initiative combines enterprise development services and seed capital to promising clean energy entrepreneurs, enabling them to deliver modern energy services and products to rural and peri-urban communities. To date, \$9.4 million has been invested in REED programmes in five countries of West and Southern Africa ([www.ared.org](http://www.ared.org)), Northeast Brazil ([www.b-reed.org](http://www.b-reed.org)) and China's Yunnan Province ([www.c-reed.org](http://www.c-reed.org)), resulting in 50 new clean energy enterprises providing better energy services to more than 400,000 people.*

*In Tanzania, REED helped Mohammed Parpia to start his business, Mona Mwanza Solar (pictured), in an area completely underserved by the national grid. Mona's solar systems provide a modern energy service, including essential lighting.*

## Consumer Finance Programmes

Where the growth of markets for clean energy investments is constrained by a lack of customer or consumer finance, UNEP works and partners with local banks and financial institutions to establish lending instruments that help build the number of loans required to be a profitable bank business. Such 'hand-holding' assistance increases the confidence of partner banks to develop and test new credit markets for low emission technologies they previously thought were too small, risky or costly to enter.

Such programmes are underway today in China, Ghana, India, Morocco and Tunisia, with others in development for Algeria, Albania, Chile, Egypt, Mexico and Montenegro. Each programme generally involves a financial mechanism, such as an interest rate subsidy or loan guarantee, technical assistance for training bank personnel, and a vendor qualification process that ensures loans are provided only for reliable equipment.

The financial mechanism provided by UNEP is not used by a bank for lending to its customers, but instead stimulates the banks to lend their own capital, which helps them gain experience with the new, clean energy sector. Although conditions for each programme vary considerably, the many common elements have allowed UNEP to build substantial experience to transfer best-practice finance models across countries and regions.

Subsidizing the finance cost of a loan has proven to be an effective inducement for banks to begin lending for clean energy systems. Banks benefit from the public image as an environmentally responsible organization, and the perception that they offer low-cost finance. One interesting lesson from these programmes in some countries, however, is that merely providing access to finance can be more important for customers than the cost of such finance. This was the case with UNEP's Indian Solar Loan Programme that offered loans for solar photovoltaic (PV) home systems through more than 2,000 bank branches.



In just three years, UNEP's Indian Solar Loan Programme helped Indian banks finance nearly 20,000 solar home systems, benefiting more than 100,000 people (photo courtesy SELCO)



As part of the GreenVillage Credit Programme, UNEP is working with the Nature Conservancy to protect biodiversity and reduce the loss of forest cover in China's Yunnan Province by using solar energy instead of wood to heat water.

Although this might imply that motivating bankers to begin lending to these sectors can be more important than the actual terms at which they lend, bankers themselves are not so easily convinced. They will generally not begin lending to a sector until they see a sufficient number of loans – 10,000 loans to homeowners for PV systems, for example. The challenge is to help bankers achieve this threshold, and then phase out the financial support as part of the transition to a fully commercial and competitive credit market.

A second interesting lesson taken from these loan programmes concerns the feedback loop arising between the actions of the banking community and policy makers. When banks begin to increase lending to a clean energy sector, they create a positive signal to policy makers that the technology is mature and ready to play a significant role in the country's energy mix. The change in perception towards sustainable

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energy finance can have a significant impact, convincing policy makers of the need to shift policies, often from a narrow technology demonstration approach to a broader, fiscal or regulatory approach.

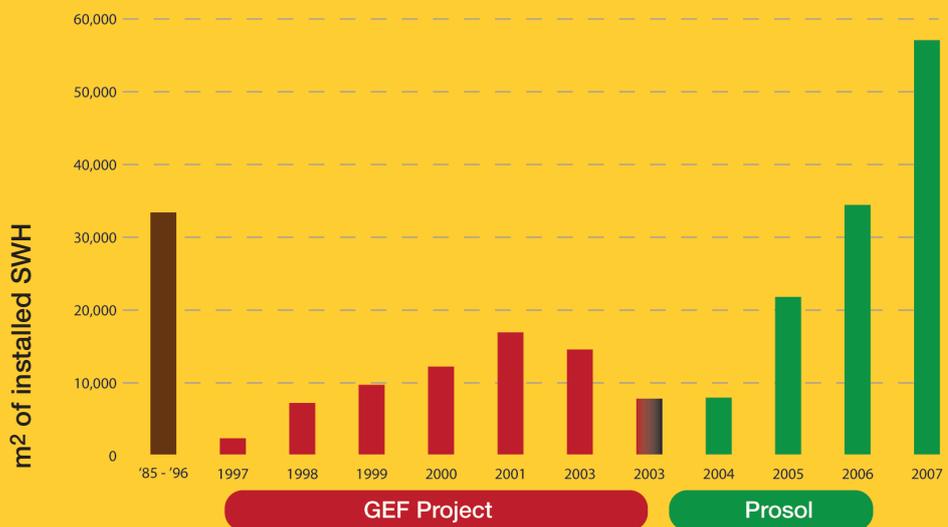
In Tunisia, for example, the **PROSOL** programme (see box) helped convince the government to change its energy subsidy framework, and the Indian Solar Loan Programme led the Indian government to consider shifting its solar photovoltaic support programme away from capital subsidies and towards the UNEP loan approach. Likewise, new and more positive signals from government also feed back to investors, further strengthening their desire to increase investment in the sector.

The positive results achieved by **PROSOL**, for example, have led the Tunisian government to set a more ambitious target for solar hot water heating, which will require a total investment of around \$125 million. If this target were met, the annual market for solar water heaters in Tunisia would become comparable to current levels of countries such as Spain or Italy, whose population is 4-6 times higher.

UNEP's experience contradicts the conventional wisdom that investors only engage once the right policies are in place. Finance and policy development evolve in parallel, with one community constantly influencing the actions of the other.



### Solar Water Heaters Market Growth in Tunisia



The Programme Solaire – or PROSOL - loan programme was launched in April 2005 to help local Tunisian banks provide low cost finance for solar hot water systems. Under PROSOL, the solar water heater market responded to the signal, adding much more capacity in 2006 than in any previous year and increasing 700% since 2004. Tunisian banks have now provided loans totaling \$12 million – five times the \$2.4 million cost of the programme – and are now comfortable enough with the sector to continue lending on their own.

The result is that more than 20,000 Tunisian families now get their hot water directly from the country's most abundant and cleanest energy source, and that number is growing. The positive results have also led the government to enact legislation aimed at shifting the country towards solar water heaters and away from water heating with Liquid Petroleum Gas.

## Key Facts: Bank Partnership Loan Programmes

Programme Strategy	Help domestic banking sectors build credit markets for small-scale renewable energy systems through the use of credit enhancements, technical support and vendor qualification.
Geographic Coverage	India, Tunisia, Morocco, Egypt, China, Ghana (soon also in and Albania, Algeria, Mexico and Chile as part of new GEF programme).
Total Budget	\$21 million
Donors	GEF, UN Foundation, Shell Foundation, Italian IMET, German BMU, The Nature Conservancy.
Typical Programme Size	\$0.4 million – \$1.5 million
Bank Co-finance	\$5 million to \$12 million per programme
Loan Portfolio Targets	10,000 to 20,000 loans per programme (less for China and Ghana due to approach taken).
Overall Impact	Can be quite significant quickly, although only for markets that are somewhat mature.
CO2 Mitigation Cost	In Tunisia, for example, the mitigation cost ranges from \$2.60 - \$9.50 per ton CO2.
Bank Lending	Can be critical to scaling up markets with direct GHG mitigation and job creation benefits.

## Carbon Finance

A rapidly evolving area is climate finance, including the Kyoto Protocol's Clean Development Mechanism or CDM. With the help of the UNEP Risø Centre, UNEP is the global leader in helping developing countries prepare for CDM investment. URC's international group of scientists, engineers, and economists provides technical and analytical support to UNEP and partners in developing countries on a range of climate, development and energy issues.

UNEP has helped build the capacity of more than 30 developing countries to participate in and profit from the CDM since it was originally defined in the Kyoto Protocol. Activities have included regional training programmes and extensive analytical work related to CDM projects, such as baseline definitions, cost analysis, project screening, and possible sustainable development indicators.

The ultimate objective of UNEP's role in the CDM market is to help create an investment climate in host countries that is conducive to identifying, developing, approving, and financing CDM projects. UNEP's efforts are specifically aimed at improving the regional distribution of CDM projects.



CDM Investment can stimulate demand for wind energy systems being constructed in this Indian factory (photo courtesy Suzlon).



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The new French-funded programme, **CASCADE**, has been launched in cooperation with the World Bank's BioCarbon Fund to support the development of African CDM projects in the forestry and bioenergy sectors. These areas have enormous potential for jointly reducing carbon emissions and improving the lives of the poor and their local environment.

At present, however, significant barriers impede these projects. Good examples and successful pilot transactions are needed to create a more favorable "carbon investment climate", and pave the way for commercial investors.

## Broad Finance Sector Engagement

Part of UNEP's strategy is to support the growth of a nascent sustainable energy finance community through an industry partnership managed by UNEP's Renewable Energy and Finance Unit and its Collaborating Centre, BASE. **The Sustainable Energy Finance Initiative**, or SEFI ([www.sefi.unep.net](http://www.sefi.unep.net)), brings together financiers, engages them to do jointly what they may have been reluctant or unable to do individually, and promotes public-private alliances that together share costs and lower barriers to investment.

SEFI publishes market research, builds networks of leading first movers, and provides training and other support activities to help local credit institutions and other financial actors operate in the sustainable energy sector.

The *Global Trends in Sustainable Energy Investment Report* was launched for the first time in 2007 with the market research firm New Energy Finance. Without doubt, *Global Trends* shows that the renewable energy and energy efficiency industries are becoming mainstream investment sectors – setting a record of more than \$100 billion worth of transactions in 2006. In 2007, the upward trend continued, with capital investments occurring in sectors and regions previously considered too risky and with too few participants to merit the attention of institutional investors.

In 2008, SEFI will launch a **Sustainable Energy Finance Alliance** (see [www.sef-alliance.org](http://www.sef-alliance.org)) to improve the sharing of public finance knowledge and development in the clean energy sector. The alliance will facilitate collaboration, intensive exchange, and the pooling of resources amongst agencies that are funding public or public/private financial mechanisms in the sustainable energy sector. Administered by BASE with the U.S.-based Clean Energy Group, the Alliance helps its members share experience and best practice on public finance instruments in the sustainable energy sector.

SEFI grew out of a long-standing voluntary partnership with the finance sector - the **UNEP Finance Initiative** (UNEP FI, <http://unepfi.net>). Initiated in 1992, UNEP FI today has more than 175 members from more than 50 countries in the insurance and banking sectors that agree to



integrate sustainable development considerations into all aspects of their operations and service

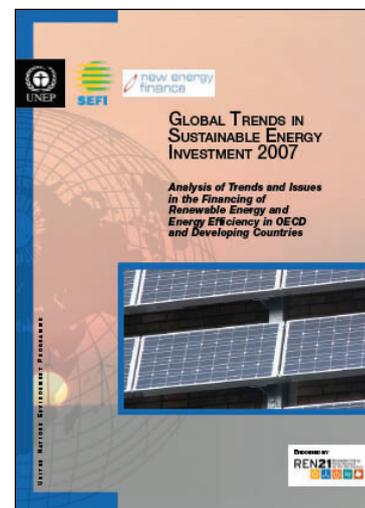
UNEP FI's work programme is focused on current and emergent issues relevant to signatories who work collaboratively to find innovative approaches to issues around finance and sustainability, including carbon finance through UNEP FI's Climate Change Working Group.

In the area of **energy efficiency**, UNEP has been working with the World Bank to support the development of new financial mechanisms in Brazil, China and India. This effort builds on the experience of the World Bank as well as UNEP's industrial energy efficiency projects.

UNEP is also helping to develop new **financial risk management instruments** to help insure against unforeseen events. Such instruments are an integral part of any commercial energy project, but their application to the renewable energy sector to date has been limited, especially in non-OECD markets. With funding from the GEF, UNEP has been

assessing financial risk management approaches for the renewable energy sector and working with the insurance industry to develop new products and services that meet the specific needs of clean energy investors.

New instruments are currently being developed through insurance industry leaders, including Munich Re, Royal & SunAlliance, Paris Re, Marsh, and others, in areas such as wind insurance for Mexican wind farms, and fuel supply insurance for Indian biomass projects.



Download the 'Global Trends in Sustainable Energy Investment 2007' Report from <http://sefi.unep.org>

## Geothermal Energy in Africa's Rift Valley

*In some regions and for some projects, the insurance industry is not yet ready to participate. In the Africa's Rift Valley, however, UNEP and the World Bank are working with a range of organizations to develop the region's rich geothermal resources.*

*With funding from the GEF, the African Rift Geothermal Energy Development Program (ARGeo) will help project developers reduce project risks during the exploration drilling phase, provide assistance for resource mapping and surface exploration activities, and build reliable, robust, and sustainable public-private sector relationships.*

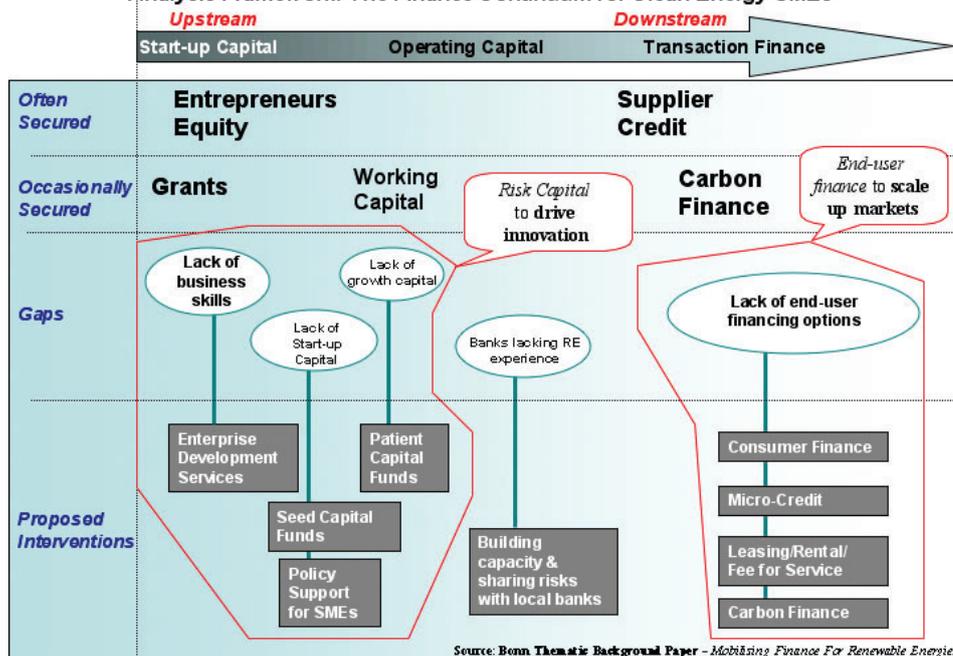


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**UNEP In-Country SME Programmes**  
**Analysis Framework: The Finance Continuum for Clean Energy SMEs**



UNEP analysis framework for planning SME finance support programmes.

## Contact and Useful Websites

SEFI - [www.sefi.unep.net](http://www.sefi.unep.net)

UNEP Energy Finance - [www.unep.fr/energy/finance](http://www.unep.fr/energy/finance)

UNEP FI - [www.unepfi.org](http://www.unepfi.org)

UNEP Collaborating Centre BASE - [www.energy-base.org](http://www.energy-base.org)

UNEP Risoe Centre - [www.uneprisoe.org](http://www.uneprisoe.org)

Sustainable Energy Finance Alliance - [www.sef-alliance.org](http://www.sef-alliance.org)

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*Creating the Climate for Change details UNEP's sustainable energy finance activities as part of an overall approach to strengthening the progression of finance needed to carry new ideas and technologies from project conception to commercial investment.*

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