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# PROTOTYPE CARBON FUND

A PUBLIC | PRIVATE PARTNERSHIP

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Utilizing  
Markets  
for Climate  
Protection  
& Sustainable  
Development

ANNUAL REPORT 2002

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This is the condensed annual report of the World Bank's Private Carbon Fund, covering the period from January 1, 2001 through September 30, 2002. The audited PCF financial statements for fiscal year 2001-2002 are available on the PCF website, [www.pcf-fund.org](http://www.pcf-fund.org). The audited PCF financial statements for fiscal year 2002-2003 are available on the PCF website, [www.pcf-fund.org](http://www.pcf-fund.org).

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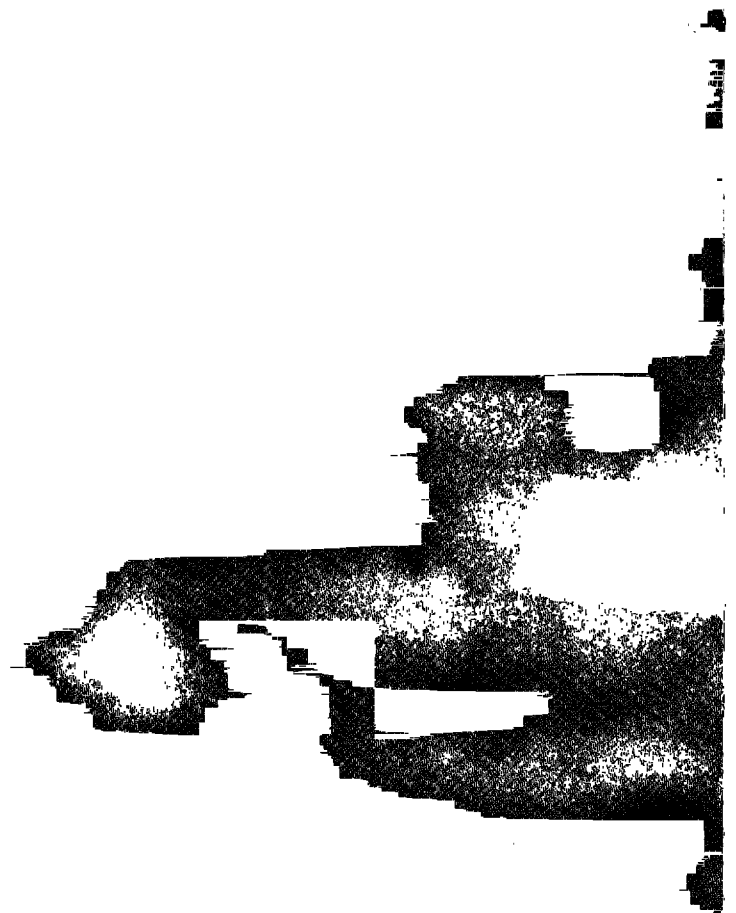
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# MISSION



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Innovation

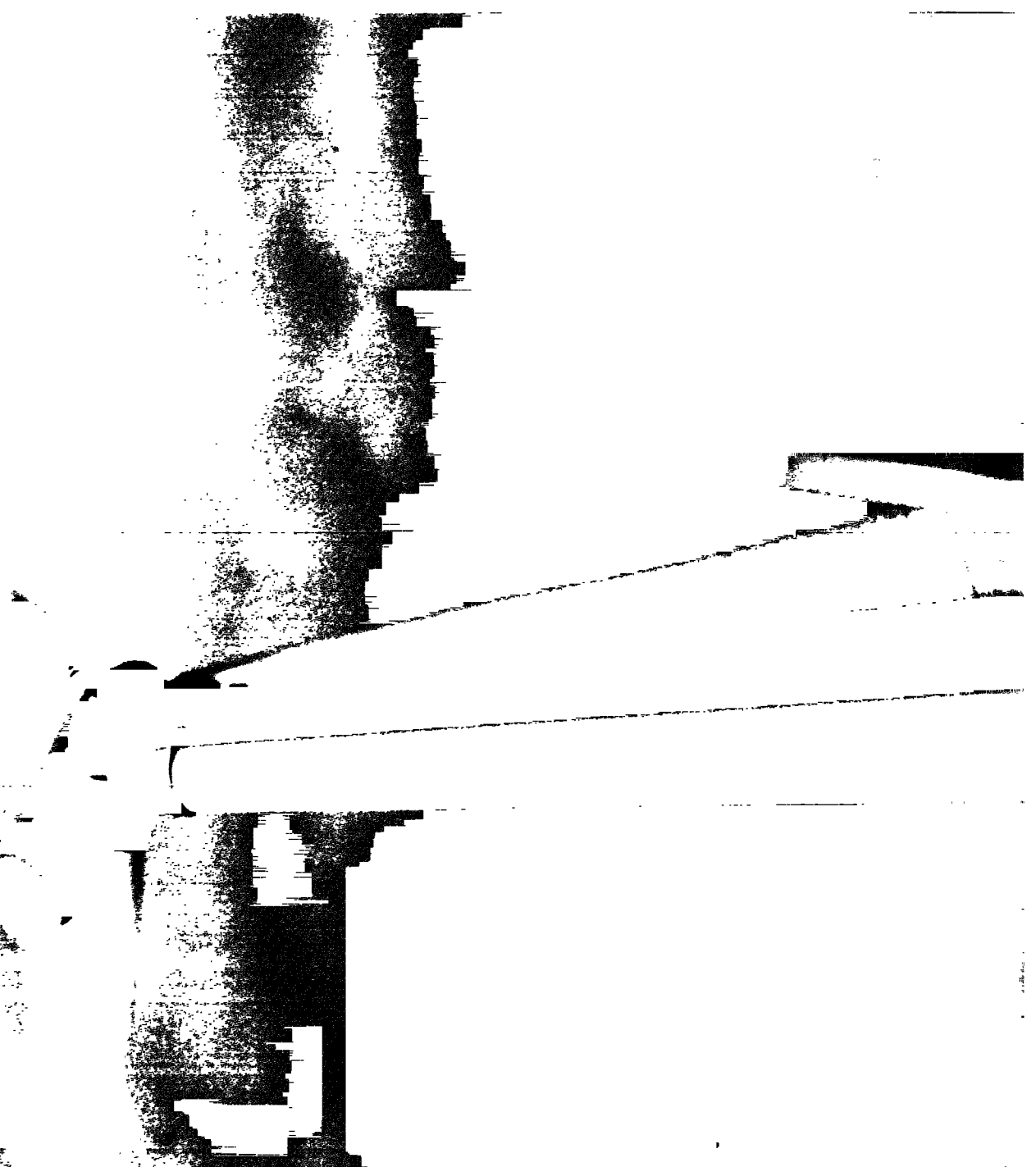
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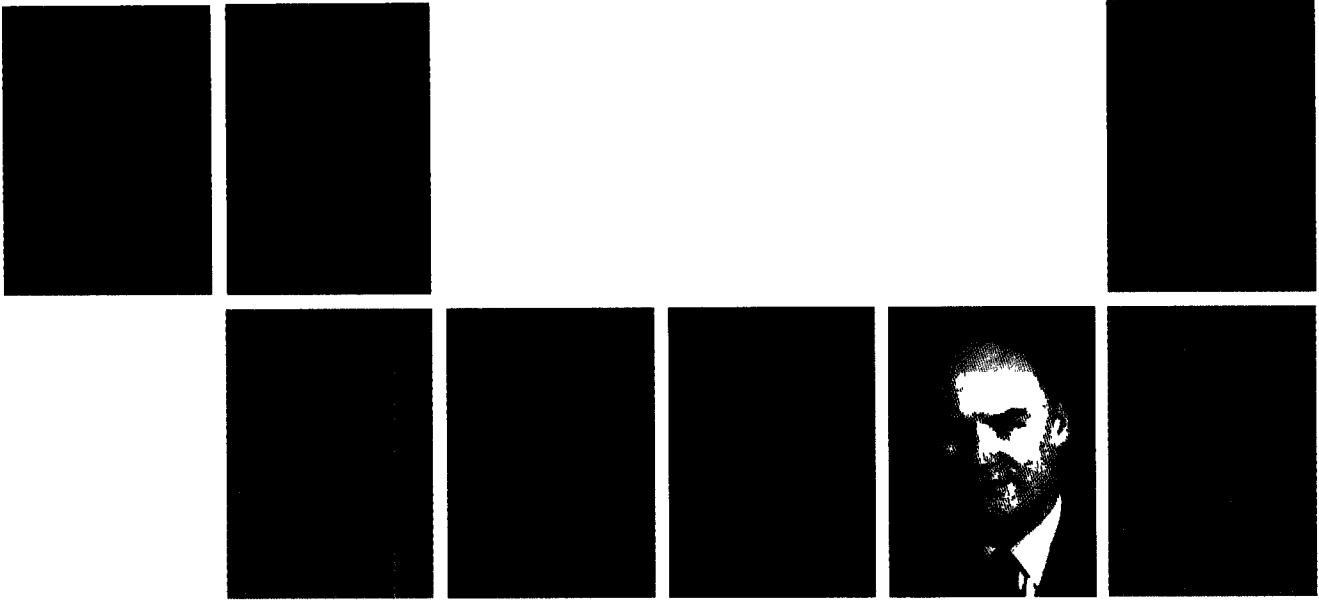
TO IT.





Su

Sustainable  
Development



## LETTER FROM THE WORLD BANK

In 2002, we have witnessed extreme climate events wreak havoc in both rich and poor countries. The impact of these events has fallen most heavily on the poorest, who are the least able to recover from such shocks. The World Bank recognizes that integrating climate change within long-term development strategies is central to achieving sustainable development, and poverty reduction.

The Private Carbon Fund (PCF) was established to mobilize public and private investment to catalyze the market for greenhouse gas emission reductions. Over the two and a half years it has been in operation, it has also provided a critical capacity building role, showing that the Kyoto Protocol can work through the application of the Clean Development Mechanism (CDM) and Joint Implementation (JI). A pioneer in the carbon asset creation and management business, the PCF has simultaneously promoted projects leading to greenhouse gas reduction, and built a unique knowledge platform used by poor countries and those interested in investing in CDM and JI projects in the developing world.

Over the past year, the PCF has developed 26 transactions to an advanced stage. The excellent progress to date resulted in governments and companies committing additional capital to the Fund.

In the next twelve months, the PCF plans to triple the volume of carbon purchases and expand the formal cleared pipeline of projects, while diversifying the portfolio to enhance its geographical mix. I wish all participants the best of success for the future.

Sincerely,

A handwritten signature in cursive script that reads "Ian Johnson".

**IAN JOHNSON**  
Vice President,  
Environmentally and Socially  
Sustainable Development  
The World Bank

## LETTER FROM THE INCOMING CHAIRMEN

It is astonishing to think about the date of birth of the PCF: it is so young and yet it feels as if it has been there for many years. For both the participants and the host countries, the decision to come aboard the PCF was risky and can only be understood in the context of a clear commitment to sustainable development and to the combat against climate change.

Many events in recent history have confirmed that they were right in their evaluations, yet we cannot say that the uncertainty has disappeared. We are still living in an unpredictable political climate and the lack of capacity in the administrations of most Parties to the Protocol (Annex I as well as non-Annex I countries) remains a major difficulty with a deterrent effect on early investments in CDM and JI.

In our view, the aim of the PCF is to play a catalytic role in the market for emission reductions. It has never been to dominate or to have an undue influence on the market itself, but to show the way forward, to overcome barriers for the benefit of all actors, and to provide host countries with an opportunity to better understand the CDM and JI processes through the motto "by doing". The projects that have been supported and which currently generate emission reductions are the best proof that this works. With time, the visibility of our action has triggered much attention and we can only congratulate the openness and transparency of the Fund Management Unit in its

Governments and businesses alike understand that the integration of sustainable development in their strategies is an essential element for their long-term growth and wealth. To support this, the inclusion of environmental targets in the economy via dedicated markets confers three advantages: first, it prices the externalities at the least cost, and triggers sound investments; secondly, it allows the economy to finance the growing requirements for the quality of our environment; and thirdly, it gives the end-users the right incentives to progressively change their consumption patterns.

In the year to come, the decisions of the CDM Executive Board will certainly be a big step forward in the learning process. In addition, host countries in particular welcome the new funds the World Bank is developing: the Community Development Carbon Fund and the BioCarbon Fund, which will allow greater involvement of small countries and rural areas in carbon finance.



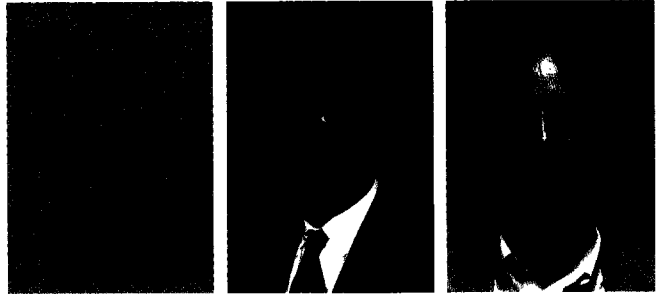
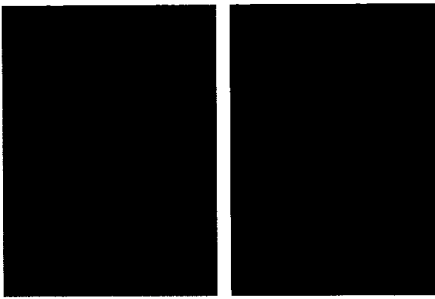
**JEAN-CLAUDE STEFFENS**  
Chairman  
Participants' Committee



**AYITE-LO AJAVON**  
Chairman  
Host Country Steering Committee







## LETTER FROM THE OUTGOING CHAIRMEN

The extreme weather events in Asia, Africa, and Central and Eastern Europe in the past year have highlighted the importance of reducing the level of greenhouse gases in the atmosphere and minimizing future emissions. It is important that we achieve climate change mitigation targets in a cost-effective way using the modalities and instruments provided by the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol.

In 2001, the meetings of the UNFCCC Conference of the Parties in Bonn and Marrakesh were successful in adopting the rules of implementation for the CDM and JI. The PCF was able to inform the Parties about its practical experience, thereby providing insights which were helpful in further developing the rules on the basis of those lessons learned. While much has been accomplished, in our view, some barriers and difficulties remain, which restrain the development of small CDM and JI projects.

The PCF has proven to be a unique platform from which to discuss matters and effect change related to CDM and JI mechanisms. It brings together host and participant country representatives, as well as the private sector and technical experts from the PCF team, providing the opportunity to exchange views and advance the knowledge base for both mechanisms.

The PCF has made significant progress this year by developing 26 carbon purchase transactions worldwide, of which 14 were negotiated. Experience shows that we can achieve emission reductions at relatively low cost, reinforcing the point that cost should not be a barrier for a climate change mitigation policy. The positive results achieved by the PCF contributed to the participants' decision to place an additional sum of US\$35 million in the PCF, increasing the total subscription to US\$180 million.

The PCF's experience shows the market's strong need for technical assistance which should be part of a continuous and coordinated process. Such assistance will play a critical role in reducing transaction costs and investment risks associated with mitigation projects, especially those in smaller countries.

This year has also seen significant progress for the PCFplus program, which was created to respond to the market using three different tools: the PCFplus fellowship program; PCFplus outreach and training activities; and PCFplus research, which analyzes the technical challenges of project development, carbon markets, and the relationship between CDM/JI and sustainable development.

The activities of the PCF have stimulated other governments and companies to become more active in the carbon market. The PCF team's knowledge has enabled the World Bank to create new funds, one focusing on small projects and rural areas that measurably demonstrate direct or indirect local community benefits, and the other concentrating on forestry and agriculture projects. We support this development and more competition in this market because we require a substantial number of CDM and JI projects to realize the targets and stimulate sustainable development.

It is important to recognize the efforts and commitment of the PCF team, which show an extraordinary level of dedication. We would also like to express our gratitude for the help and support provided by our colleagues in the Participants' Committee and Host Country Committee, with whom we remain committed to continue work and increased co-operation in the further development of the Participants' Carbon Fund.

**EDUARDO DOPAZO**  
Chairman  
Host Country Committee

**MAURITS BLANSON HENKEMANS**  
Chairman  
Participants' Committee

## NOTE FROM THE FUND MANAGER

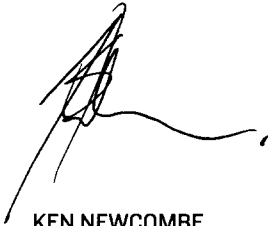
Dear Friends,

It is my pleasure to share some insights on carbon finance and sustainable development based on the PCF's experience after two and a half years of implementation. To begin with, it is encouraging that carbon market transaction volumes have grown since the Marrakesh Accords were adopted in November 2001, exceeding 200 million tonnes of CO<sub>2</sub> equivalent assets transacted since 1996 through a greater diversity of carbon assets and market players. I am also grateful that PCF Participants have decided to increase total funding to the approved cap of \$180 million, enabling PCF's emission reductions purchase phase and its rich learning value to extend until mid-2004.

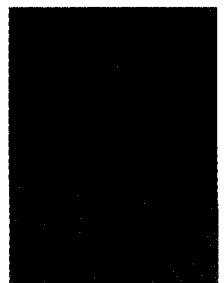
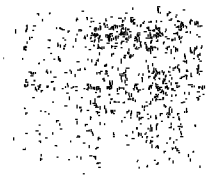
Our experience from 26 transactions developed to an advanced stage in the past year reinforces our view that the potential of CDM and JI to increase the profitability and volume of renewable energy and energy efficiency projects globally is significant. More impressive still is the impact of carbon finance on the bankability of clean technology investments in municipal solid waste, crop waste-to-energy conversion, and soil fertility conditioning. Even at low carbon prices, these applications demonstrate the power of carbon finance as a driver of sustainable development, mitigating local pollution in a socially responsible way, and creating reliable energy supply for burgeoning developing country populations while mitigating global climate change.

We recognize that without targeted and focused assistance in mitigating business risks and lowering transaction costs, carbon finance will reach only the larger developing economies, which already benefit from private capital flows. The PCF has demonstrated how to channel carbon finance to small-scale renewable energy and energy conservation activities which provide measurable, independently certifiable development benefits at the community level. This experience has led the World Bank to promote new carbon funds, such as the Community Development Carbon Fund (CDCF) which was launched in Johannesburg in September 2002 at the World Summit on Sustainable Development. The CDCF will extend the reach of the Clean Development Mechanism to the smaller, poorer countries and remote rural communities.

Over the coming year the PCF Fund Management Unit is pledged to triple the volume of carbon purchases under the PCF and grow the formal cleared pipeline of projects to the equivalent of US\$200 million in carbon purchase. We also intend to substantially increase our carbon purchases in the Asian region to balance the PCF's portfolio geographically. Meeting these targets will expand our contribution to "learning by doing" in exciting ways.



**KEN NEWCOMBE**  
Fund Manager

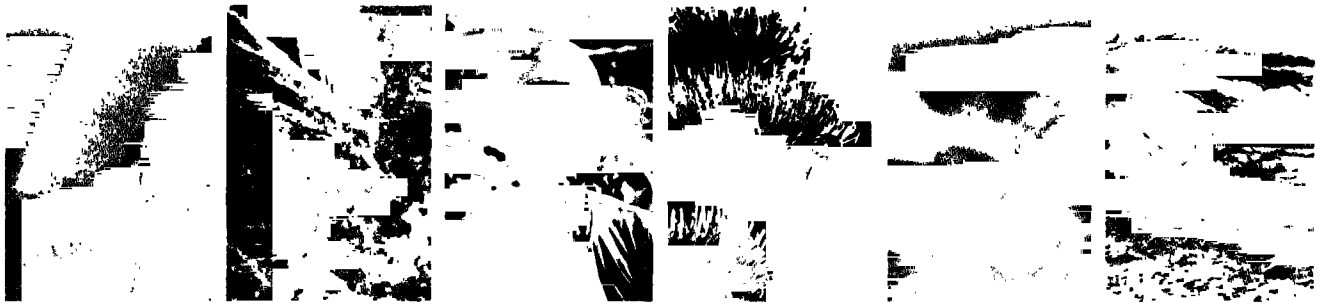




clockwise from left:  
Chile Chacabuquito  
hydro project; planting  
seedlings:  
Bulgaria Svilosa  
biomass project;  
Plantar Sequestration  
and Biomass Project,  
Brazil.



# HIGHLIGHTS 2002

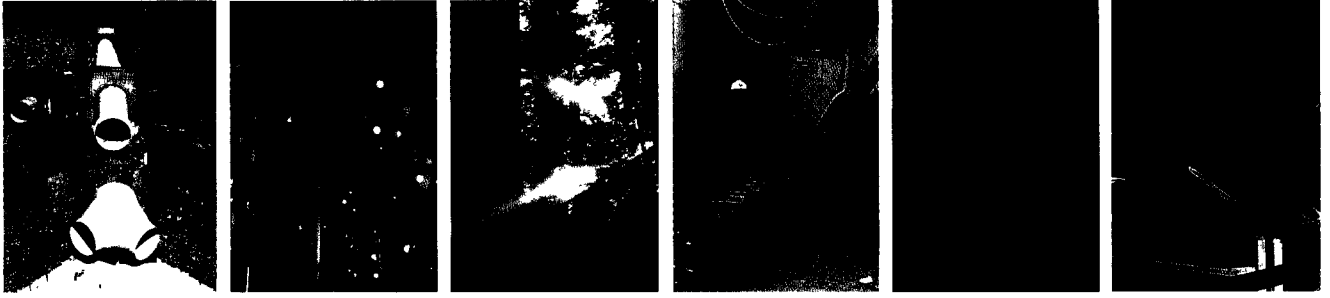


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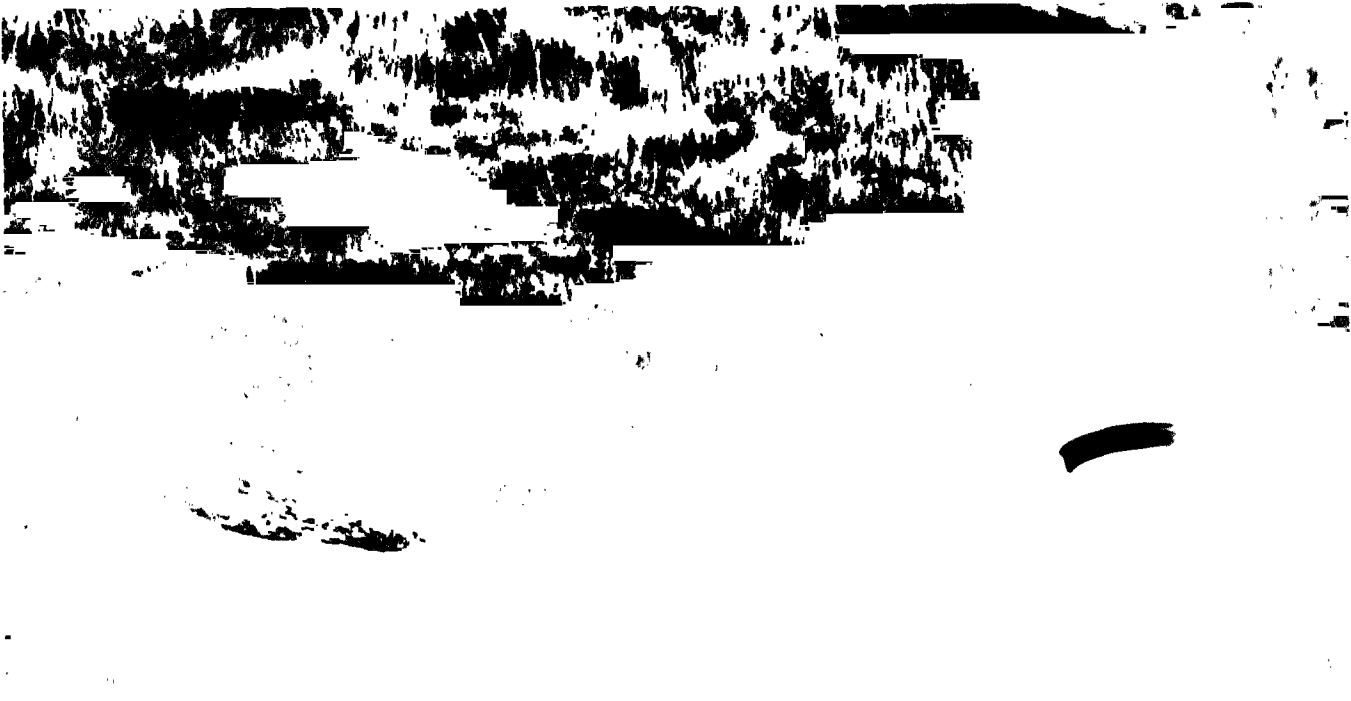
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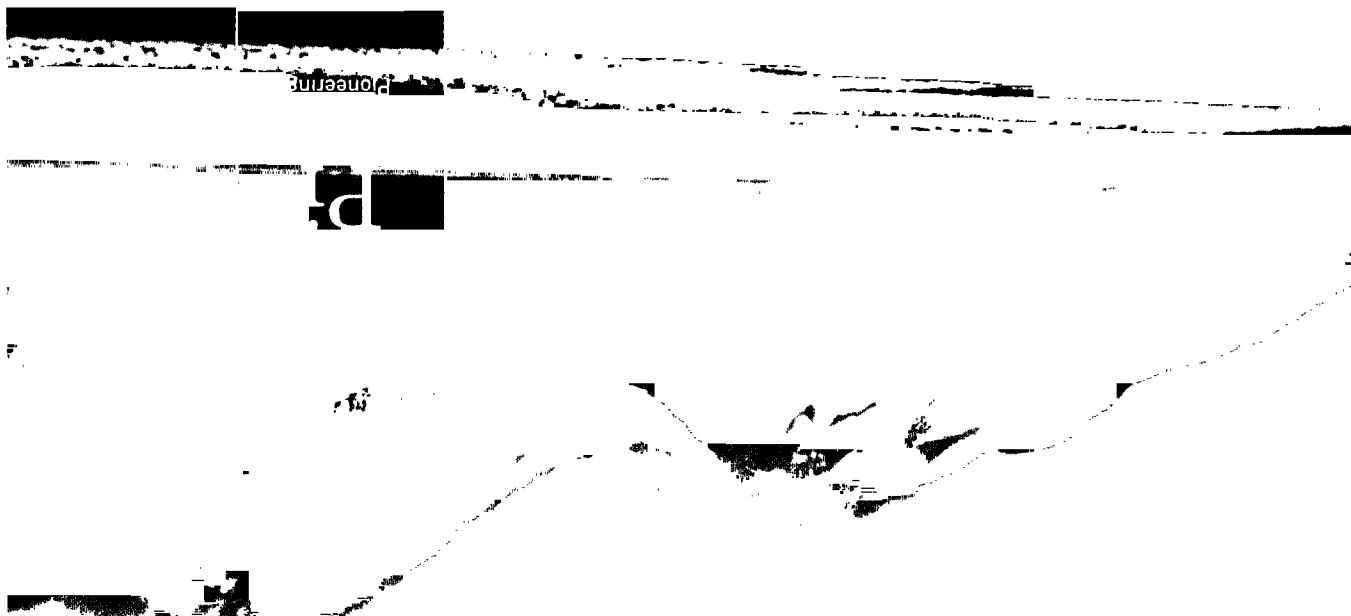
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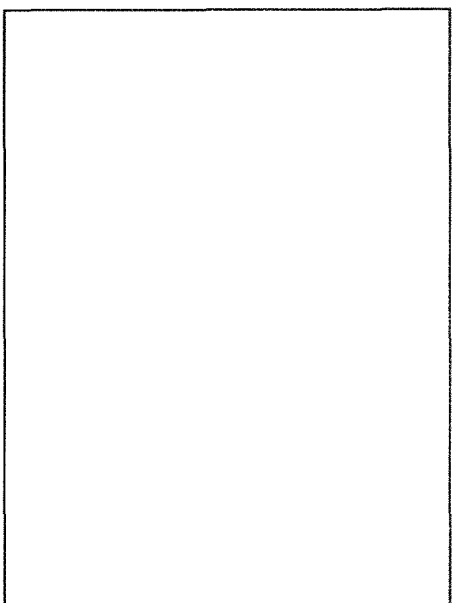
Our project in Chile,  
Chacabunquillo, captures  
three assets in one pro-  
ject: water rights, power  
provision, and reduction  
of GHG emissions.



Project



# A Global Challenge



**The cost-effective reduction of greenhouse gas emissions to avert the most severe impacts of climate change remains one of the widely accepted priorities for global action. The Kyoto Protocol, adopted under the United Nations Framework Convention on Climate Change (UNFCCC) in 1997, was designed to address this priority while promoting sustainable development. Under the Protocol, industrialized countries (defined as Annex I countries) must reduce their carbon emissions by an average of 5.2 percent below their 1990 levels in the period 2008-2012.**

To meet these commitments in the most cost-effective manner, the Protocol contains provisions allowing Annex I countries some flexibility to meet their obligations through projects generating emission reductions (ERs) elsewhere. Two provisions are particularly important:

- › Article 6 allows for the Joint Implementation (JI) of projects by industrialized countries, including those with economies in transition. Under this provision, an entity in one country finances or purchases ERs from a project in another;
- › Article 12 provides for a similar project-based mechanism, the Clean Development Mechanism (CDM), under which an entity in an industrialized country purchases ERs from a project in a developing country.

The purpose of both mechanisms is to assist host countries with sustainable development through the transfer of cleaner technology and financial resources for specific projects, while at the same time contributing to the objectives of the UNFCCC by lowering emissions of greenhouse gases.

This critical priority continues to take shape through ongoing global initiatives. At the occasion of the 7th session of the Conference of the Parties to the UNFCCC, held in November 2001 in Marrakesh, the Parties to the Convention reached agreement on many of the outstanding issues relating to the implementation of project-based mechanisms under the Kyoto Protocol. The impact of the so-called *Marrakesh Accords* on the PCF will be discussed in greater detail in subsequent chapters of this year's report. Most recently, the Johannesburg Plan of Implementation of the September 2002 World Summit on Sustainable Development reiterated the

importance of bringing the Kyoto Protocol into force and to begin serious efforts to reduce carbon emissions.

#### **PIONEERING CHANGE**

Launched in 2000 by the World Bank, the Prototype Carbon Fund (PCF) is a public-private partnership aimed at catalyzing the market for project-based greenhouse gas ERs. Funded by six governments and seventeen private sector companies, with a total capitalization of \$180 million, the PCF is pioneering ER purchase transactions under the emerging rules of the CDM and JI, demonstrating how such transactions can lower the cost of compliance with the Kyoto Protocol, and sharing its practical experience with decisionmakers, host countries and market players.

The PCF has identified many opportunities to reduce greenhouse gas emissions in developing countries at a price of \$3-4 per tonne of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e). This compares very favorably with a marginal abatement cost of more than \$15/tCO<sub>2</sub>e in most industrialized economies, and substantially higher levels in the most energy-efficient economies. It is the difference in cost between industrialized and developing countries that provides the opportunity for mutually beneficial trading relationships. By supporting climate-friendly investments, the PCF also addresses the root cause of climate change in developing countries.

In terms of adverse impacts, the Intergovernmental Panel on Climate Change (IPCC) estimated in 1995 that the cost of climate change could be as high as 5 to 9 percent of GDP in developing countries. This is several times higher than the costs that would be borne by industrialized countries. Among the World Bank's member countries, the

## The PCF allows developing countries to **COMPETE** in the emerging global carbon market.

IPCC also concluded that the poorest would be at the greatest disadvantage.

Over the two and a half years since its launch, the PCF has provided a critical capacity building role and contributed practical learning experience as the guidelines and the modalities of the market for project-based ERs continue to develop. Furthermore, as the PCF applies the fundamentals of carbon finance in the field, it continues to demonstrate the power of the carbon market to drive sustainable development in a socially responsible way.

### **STRATEGIC OBJECTIVES**

From its inception, the PCF has followed three primary strategic objectives:

1. **High Quality ERs:** to show how project-based greenhouse gas ER transactions can promote and contribute to sustainable development and lower the cost of compliance with the Kyoto Protocol;
2. **Knowledge Dissemination:** to provide the Parties to the UNFCCC, the private sector, and other interested parties with an opportunity to "learn by doing" in the development of policies, rules, and business processes for the achievement of ERs under CDM and JI;

3. **Public-Private Partnerships:** to demonstrate how the World Bank can work in partnership with the public and private sectors to mobilize new resources for its borrowing member countries while addressing global environmental problems through market-based mechanisms.

### **PROGRESS THROUGH STRUCTURED PARTNERSHIPS**

In 2002 nine participants in the PCF committed additional capital to the PCF, bringing the subscription in the Fund to \$180 million. An allocation mechanism has been applied to finalize the new shareholding quotas under the now fully subscribed Fund. All companies and governments contributing to the PCF will receive a pro rata share of the ERs gained from projects, verified and certified in accordance with the Kyoto Protocol.

Countries hosting PCF projects participate actively in the PCF as a formal element of its governance, providing advice and receiving technical assistance in preparing to participate in the CDM and JI. Membership in the Host Country Committee has grown steadily to over 40 by mid-2002. Over the last year, the number of countries with Participant Committee-cleared projects in the pipeline has more than doubled.







Carbon finance can accelerate the implementation of energy-efficient technologies (PCF project in Bulgaria)

< BEFORE AFTER >

PCF is a closed-ended fund, with all funds to be placed by 2004. However, the positive response to carbon finance engendered by the PCF's success has moved the World Bank to diversify its carbon finance business by developing new products to extend the benefits of CDM to poorer, smaller countries and rural communities.

#### BRINGING IDEAS INTO ACTION

Over the past year, the PCF has developed 26 transactions to an advanced stage, bringing ideas into action with positive impact. This year's report will provide a road map of the PCF's progress during 2002, beginning with a closer look at progress in project portfolio development in Chapter 2. In subsequent chapters, we review three key components of structuring projects, examining the PCF's advances in building the legal framework of transactions, our progress in refining the financial structure, and in the methodology behind creating the carbon asset. Finally, we will explore the progress made in the PCF's mission to disseminate knowledge to participants and stakeholders.

#### LOOKING AHEAD

In the next twelve months, the PCF will continue to advance its ongoing goals of encouraging public-private partnerships, generating high quality ERs through sustainable development, and providing a global forum for the sharing of knowledge. More specifically, in the coming year, the PCF has committed to:

- › Triple the volume of carbon purchases and expand the formal cleared pipeline of projects, to the equivalent of US\$200 million in carbon purchase.
- › Diversify the PCF's portfolio. To diversify geographically, the PCF will substantially increase our carbon purchases in the Asian region, while balancing growth in other regions. To diversify technologically, the PCF will pursue a suitable balance of both renewable energy and energy efficiency projects.
- › Enhance efficiencies through the pursuit of larger transactions, and streamlined processing and origination.

## PCF MILESTONES

JULY 1997

JULY 20, 1999

JANUARY 18, 2000

APRIL 10, 2000

## PARTICIPANTS

### GOVERNMENTS

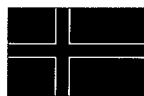
Government of Canada  
Government of Finland  
Japan Bank for International Cooperation  
Government of The Netherlands  
Government of Norway  
Government of Sweden

### CORPORATIONS

British Petroleum, United Kingdom  
Chubu Electric Power Co., Japan  
Chugoku Electric Power Co.,  
Japan  
Deutsche Bank, Germany  
Electrabel, Belgium  
Fortum, Finland  
Gaz de France, France  
Kansai Electric Power Co., Japan  
Mitsubishi Corp., Japan  
Mitsui & Co., Ltd., Japan  
Norsk Hydro, Norway  
RaboBank, The Netherlands  
RWE, Germany  
Shikoku Power Co., Japan  
Statoil, Norway  
Tohoku Electric Power Co., Japan  
Tokyo Electric Power Co., Japan



JBIC



MAY 15, 2000

OCTOBER 2001

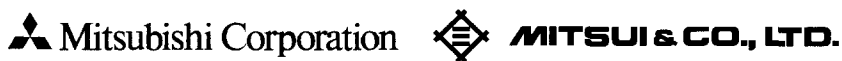
JUNE 19, 2002

OCTOBER 2001

JUNE 2000

JULY 2002

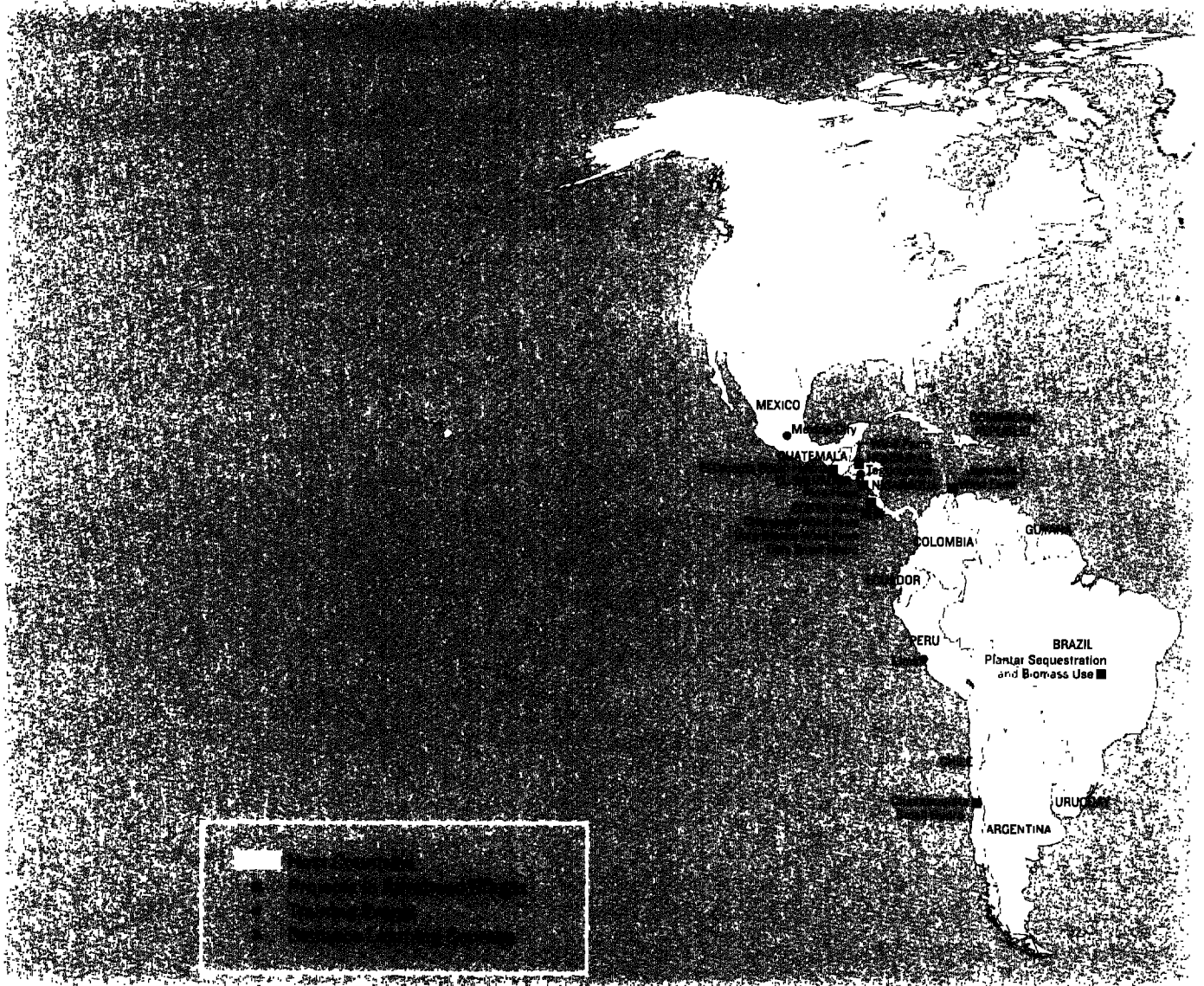
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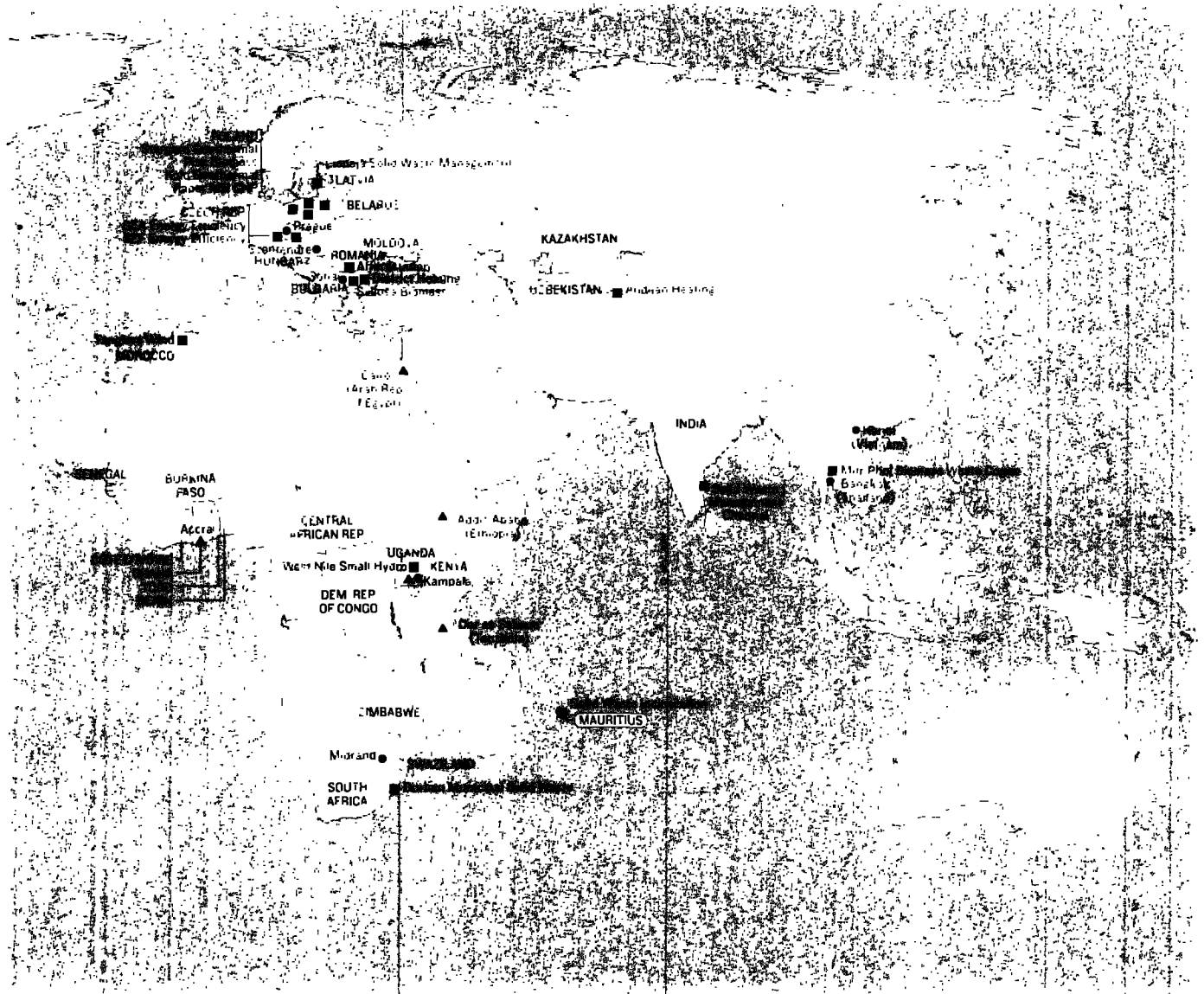


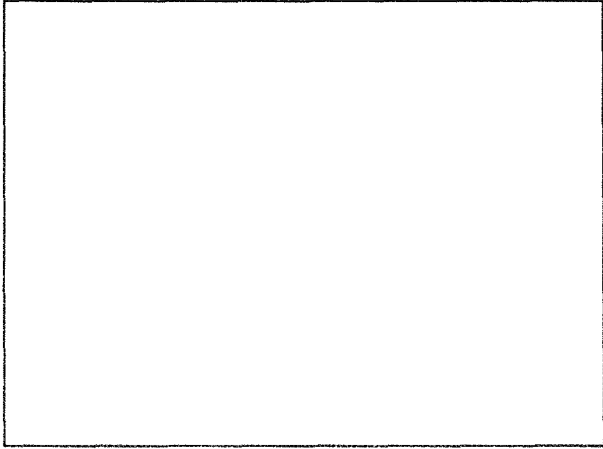
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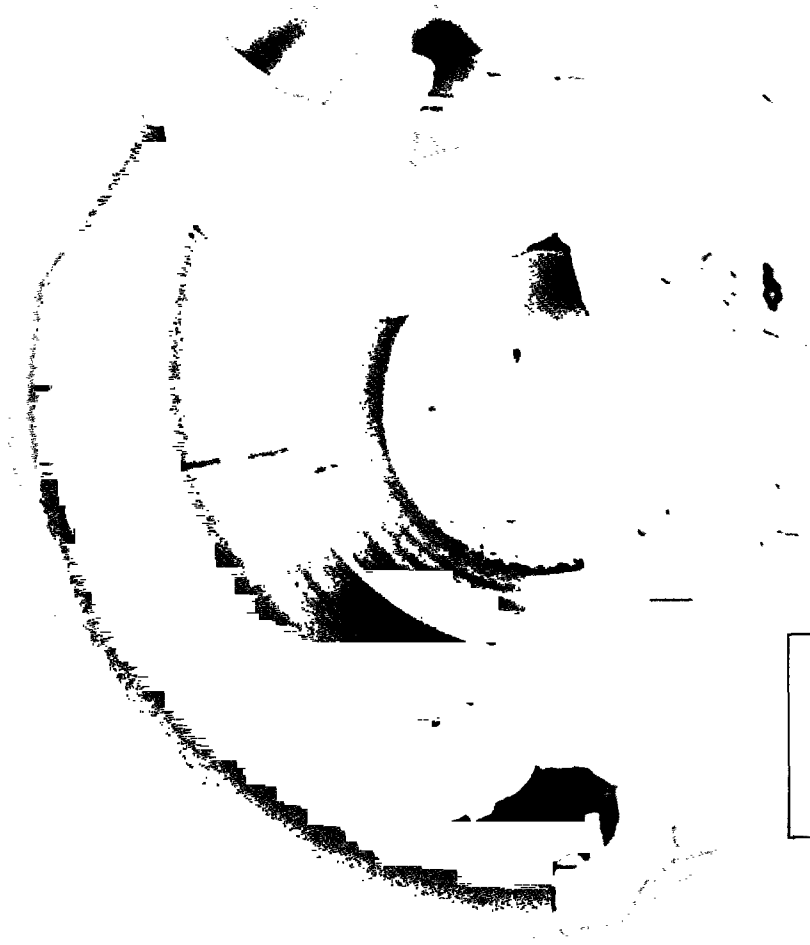
# HOST COUNTRIES, PROJECT PIPELINE AND TRAINING







# Project Portfolio Development



Er  
Emission  
Reductions

The Chacabuquito run-of-river hydroelectric project in Chile started operations in 2002 and is expected to be the first PCF project to generate certified emission reductions

The PCF has built strategic coalitions with both the public and private sectors to mobilize new resources for sustainable development and to address global environmental problems through market based mechanisms. Through increases in funding this year, the PCF is now positioned to commit US\$180 million, purchasing ERs from approximately 30 to 40 projects, and it intends to identify, prepare, and approve these transactions by mid-2004.

Various stakeholders including PCF participants, host country governments and non-governmental organizations (NGOs), were involved in the design of the PCF's project selection and portfolio development criteria, which are described in the *Instrument Establishing the Prototype Carbon Fund*. Over the past year, the PCF has continued to work towards a balanced portfolio, aiming for technological and geo-political diversity for projects undertaken in economies in transition and in developing countries. The PCF is supporting projects in the areas of both renewable energy and energy efficiency. A small number of forestry, land use and land-use-change projects that meet the eligibility criteria of the Kyoto Protocol and the Marrakesh Accords will also be identified and implemented.

#### STATUS OF PROJECT PORTFOLIO DEVELOPMENT

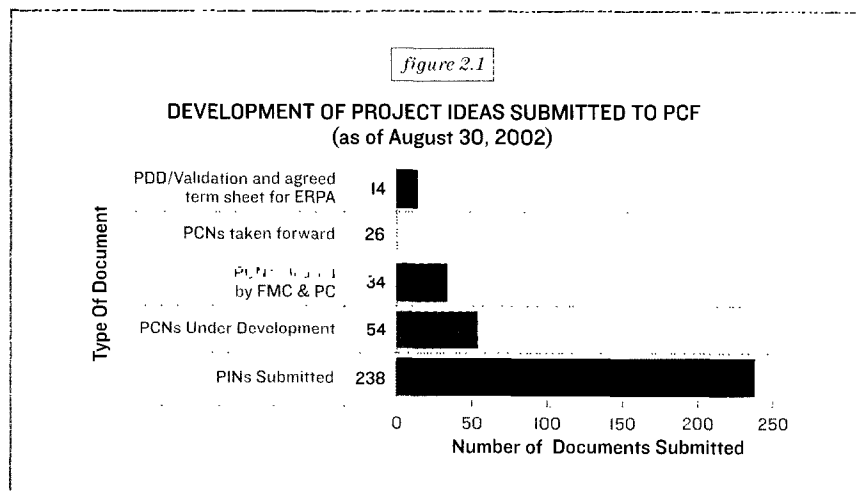
The PCF Project Cycle begins with three separate stages of preparation and review:

› Project Idea Note (PIN), which if cleared by the Fund Management Unit (FMU) may lead to

› Project Concept Note (PCN), which if cleared by the Fund Management Committee (FMC) and the Participants Committee (PC) may proceed to the final stage

› Project Design Document (PDD).

As of the end of August 2002, the PCF had received close to 240 Project Idea Notes. Project Concept Notes were prepared and cleared for 34 of these projects to date. Excluding 8 projects that are currently on hold or have been dropped, 26 projects with ER purchases totaling approximately US\$106 million are at various stages of preparation or completion. Of these 26 projects, 14 have progressed to advanced stages of the PCF project cycle to date, including Project Design Document, baseline study, monitoring plan, validation, and agreement of term sheet for Emission Reductions Purchase Agreements (ERPAs). The 26 MW Chile Chacabuquito run-of-river hydroelectric project, commissioned on July 2, 2002, is the first PCF project to begin generating ERs.



COUNTRY/ PROJECT NAME	PROJECT DESCRIPTION	PCF CONTRACT (in million us\$)	PCF ERPA ERs tCO <sub>2</sub> e	TOTAL ER FOR PROJECT tCO <sub>2</sub> e
<b>PDD/VALIDATION AND AGREED TERM SHEET FOR ERPA</b>				
<b>LATVIA:</b> Liepaja Solid Waste Management	Methane capture from waste management and CO <sub>2</sub> reduction from power generation	2.5	368,101	368,101
<b>CHILE:</b> Chacabuquito Small Hydro	26 MW run-of-river hydro to replace coal or gas in the grid	6.7	1,750,000	2,597,400
<b>UGANDA:</b> West Nile Small Hydro	1.5 and 5.1 MW small hydro to replace a number of diesel generator sets in West Nile region	3.9	1,300,000	1,884,102
<b>BRAZIL:</b> Plantar Sequestration and Biomass Use	Charcoal produced from sustainably harvested plantation replacing coke for pig iron manufacture	5.3	1,514,286	12,885,986
<b>ROMANIA:</b> Afforestation	Afforestation of 6,728 ha of public land	3.7	1,018,000	1,018,159
<b>COSTA RICA:</b> Chorotega Wind Farm	8.4 MW wind farm to displace thermal power capacity addition	0.9	262,660	302,800
<b>COSTA RICA:</b> Vara Blanca Wind Farm	9.6 MW wind farm to displace thermal power generating units in the provinces of Heredia and Alajuela	1.0	284,660	329,100
<b>COSTA RICA:</b> Cote Small Hydro	6.3 MW hydro to replace thermal power generation	0.6	172,120	173,700
<b>COLOMBIA:</b> Jepirachi Wind Farm	19.5 MW wind farm in the northern part of Colombia to displace a mix of coal- and gas-based power generation.	3.2	800,000	1,168,247
<b>NICARAGUA:</b> Rice Husk	1.43 MW capacity power plant utilizing rice husk waste to supply power to the Chinandega rice and flour mill	0.5	141,600	212,395
<b>CZECH REPUBLIC:</b> CEA Energy Efficiency	Energy efficiency measures and renewables through the Czech Energy Agency (CEA)	2.6	650,000	650,000
<b>CZECH REPUBLIC:</b> SEF Energy Efficiency	Energy efficiency measure and renewables through the State Environmental Fund (SEF)	2.6	650,000	650,000
<b>POLAND:</b> Stargard Geothermal	District heating system to utilize geothermal energy to replace coal in the city of Stargard	1.1	364,553	364,553
<b>POLAND:</b> Pisz Biomass	Plywood industry to meet part of its energy need using biomass waste. Local district heating system to utilize part of the heat	0.6	190,630	190,630
<b>PCNS CLEARED BY FMC &amp; PC</b>				
<b>GUATEMALA:</b> El Canada Small Hydro	49 MW peaking run-of-river hydroelectric plant in the west coast of Guatemala to displace thermal power plants	7.5	2,000,000	2,100,000
<b>SOUTH AFRICA:</b> Durban Municipal Solid Waste	10 MW gas-fired generator to produce electricity from landfill-collected methane	10.0	3,350,000	6,790,000
<b>BULGARIA:</b> District Heating	District heating system upgrades for the cities of Sofia and Pernik	8.2	2,774,973	2,774,973
<b>BULGARIA:</b> Svilosa Biomass	13.4 MW biomass-based boiler to utilize wood waste produced at the Svilosa pulp and cellulose plant to replace coal-fired boiler	2.7	897,293	897,293
<b>POLAND:</b> Kolo Geothermal	Geothermal-based heating system to replace coal-fired system in the city of Kolo	0.6	208,971	208,971
<b>POLAND:</b> Paper Mill CHP	164 MW Circulated Fluidized Bed (CFB) boiler to replace coal boiler to supply electricity and heat to pulp and paper mill in Northern Poland	3.5	1,000,000	1,485,000
<b>THAILAND:</b> Mitr Phol Biomass Waste Cogen	40 MW bagasse cogeneration at the facility of Mitr Phol	8.3	2,770,000	2,770,000
<b>UZBEKISTAN:</b> Andijan Heating	District heating system replacement and upgrade in the city of Andijan	1.0	330,000	1,240,000
<b>INDIA:</b> Solid Waste Management	14.85 MW of electricity generation utilizing municipal solid waste in Chennai	10.5	3,513,015	3,513,015
<b>HONDURAS:</b> Wind Farm	60 MW wind power plants to displace thermal plants in Francisco Morazan Province	4.8	1,374,480	2,886,408
<b>MAURITIUS:</b> Solid Waste Incineration	11.2 MW waste incineration plant to manage municipal waste and generate electricity	3.5	1,000,000	1,080,095
<b>MOROCCO:</b> Tangiers Wind	140-200 MW wind farms along the northern coast of Morocco to displace thermal generation sources	10.0	3,300,000	5,818,000
<b>TOTAL</b>		<b>105.8</b>	<b>31,985,342</b>	<b>54,358,928</b>



## GUIDANCE BY THE PCF PARTICIPANTS

PCF participants have provided regular guidance on how to achieve regional and technological diversity in the PCF portfolio. The current set of guidance, provided at the PCF's Annual Meetings in Zakopane, Poland in June 2002 includes that:

- › No more than US\$35 million should be allocated to Latin America
- › US\$25 million should be set aside for countries in East Asia and the Pacific
- › US\$25 million is provided for Central and South Asia
- › US\$20 million is dedicated to projects in Africa
- › US\$75 million will be allocated for JI projects
- › Up to US\$15 million can be allocated for land-use, land-use change and forestry (LULUCF) projects. In addition to a LULUCF project in a JI country, attempts should be made to identify an eligible CDM LULUCF activity
- › The PCF should increase efforts to identify and develop energy efficiency projects.

# Te

Technologies

In the PCF project cycle, initial verification takes place upon construction completion, to ensure that specifications of the Monitoring Protocol are met. (Chile Chacabuco run-of-river hydroelectric project)



### REGIONAL DISTRIBUTION OF PCF PROJECTS

Geographic diversity of its portfolio is a key focus of the PCF going forward. While the number of project proposals emerging from the Latin America region continues to grow, a balance is beginning to emerge in Eastern Europe and Africa. Outreach and consultation with countries in South Asia and East Asia is beginning to bear fruit, particularly in India and Vietnam. PCF participants have requested that at least US\$25 million be used to purchase ERs in the East Asia region. A number of large projects being considered in China would allow the PCF to achieve this target. The challenge lies in limiting the Latin America portfolio to US\$35 million. A similar challenge awaits in limiting the Africa portfolio to US\$20 million, given the expected active participation of South Africa.

### TECHNOLOGY MIX IN THE PCF PIPELINE

Technological diversity is also critical for the PCF's pipeline. The PCF intends to achieve a 3:2 ratio between renewable energy and energy efficiency projects. Renewable energy dominated the projects going forward in the first part of the fiscal year 2002. With greater effort being devoted to locating suitable energy efficiency projects (including demand-side management, such as manu-

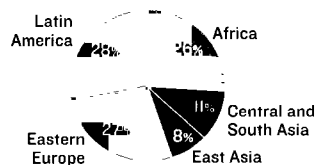
facturing process, building and appliance efficiency measures; and supply-side efficiency such as transmission, distribution efficiency measures, and gas flaring reduction), the PCF portfolio is now achieving a better strategic balance.

At the request of PCF participants, the representation of wind energy has decreased as the project pipeline has become more diversified with the inclusion of a number of biomass, waste to energy and small hydro projects. The pipeline, however, does not include either transport or pico-projects, despite efforts to identify them, because of the complexity and high transaction costs involved.

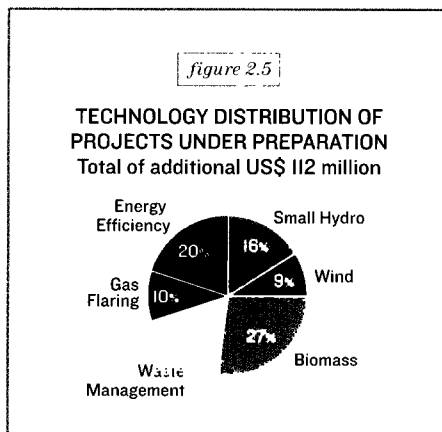
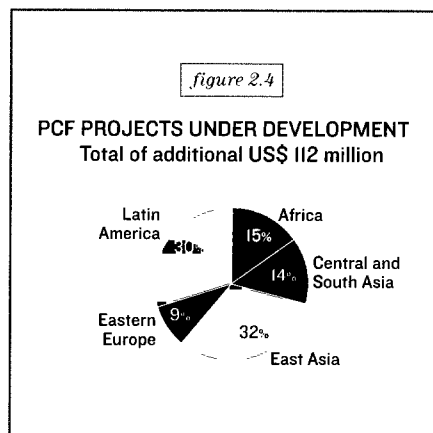
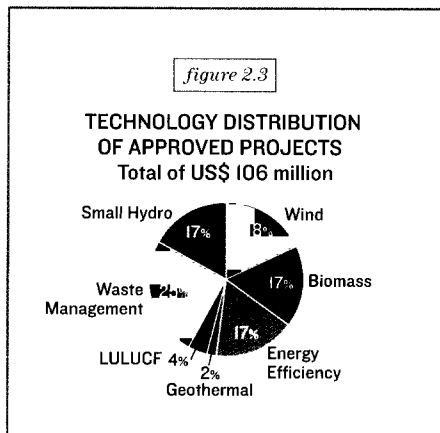
figure 2.2

### REGIONAL DISTRIBUTION OF APPROVED PROJECTS

Total of US\$ 106 million



Our aim is to contract high quality CDM-eligible projects with WELL BALANCED BENEFITS for all parties.



to delivering US\$25 million of ER purchase contracts in the region in the coming two years. This is the highest priority for the PCF for the coming year.

› **Finding larger transactions.** At its launch, it was envisaged that the average ER purchase from each project would be approximately US\$8 million, leading to a portfolio of 10-15 projects. Experience over the last two years of operation has suggested that the average size of PCF purchase from a project is closer to US \$3.4 million. This would indicate that more than 50 projects would be needed to purchase the US\$180 million capitalization of the PCF. To avoid undue large transaction and administrative cost burdens, the Fund Management Unit has suggested that about half of the ER purchase business target for the remaining years of the PCF be sourced from projects with ER purchase contracts exceeding US\$7 million each.

#### LOOKING AHEAD

In addition to the PCNs cleared by the PCF Participants Committee, an additional 22 proposals are currently being prepared as PCNs. These projects are estimated to generate ERs valued at about US\$112 million.

› **Going East.** With healthy project pipelines in Latin America and a growing pipeline in Africa, South Asia and Eastern Europe, the PCF will sharpen its focus on extensive outreach and consultation with countries in East Asia including small island states. Discussions have been ongoing with China and Vietnam, and have recently been initiated with Indonesia. The PCF is committed

› **Sectoral Approaches.** Some sectors in larger developing countries offer opportunities for large volumes of ERs. Sectoral approaches offer a number of advantages, including reduced transaction costs through simplified methodologies and procedures and coordinated approaches. In the coming two years, the PCF intends to explore such opportunities in larger countries like Brazil,



# Dy

Dynamics

Afforestation can significantly restore impoverished soils, as shown in a 9 year old *Robinia* stand used as a test site in Romania.

< BEFORE AFTER >

China, India, Mexico and South Africa in sectors such as waste management, bagasse cogeneration, and gas flaring reduction. The challenges include the development of simplified procedures and methodologies acceptable under the Kyoto Protocol while maintaining the high value and credibility of the ERs and defining contractual relationships with parallel purchasers.

› **Intermediation of transactions.** Recognizing that the use of intermediaries has substantial potential to lower costs and reduce risks entailed in buying ERs of small and medium scale enterprises, the PCF continues to strive diligently to develop agreements to work with and through intermediaries. Through agreements with institutions including the Development Bank of Southern Africa and the Infrastructure Development Finance Corporation of India, the PCF hopes to improve the efficiency of finding attractive CDM projects at much lower costs and building local and regional capacities to engage in the carbon market. Over the next year, these partnerships should demonstrate the effectiveness of these measures and offer insights for further streamlining.

› **Including non-CO<sub>2</sub> greenhouse gases.**

Recognizing that there are a number of other greenhouse gases with much higher global warming potential than CO<sub>2</sub>, the PCF will actively seek projects targeting other greenhouse gases from industrial production (such as nitrous oxide as an unintended by-product of adipic acid and nitric acid manufacture or perfluorocarbon emissions from aluminum production) and will continue to pursue methane mitigation projects.

› **Land-use change and forestry projects.**

The PCF land use, land-use change and forestry (LULUCF) portfolio currently consists of two projects — the Brazil Plantar project, a hybrid energy-forestry project, and the Romania Afforestation project. The participants decided at their February 2002 meeting in Paris to support one more CDM LULUCF project. Over a dozen new project idea proposals from Eastern Europe, Africa and Latin America have been received and are under review by the Fund Management Unit.

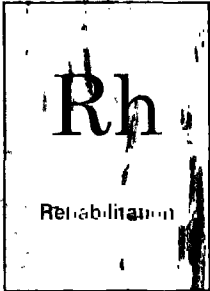
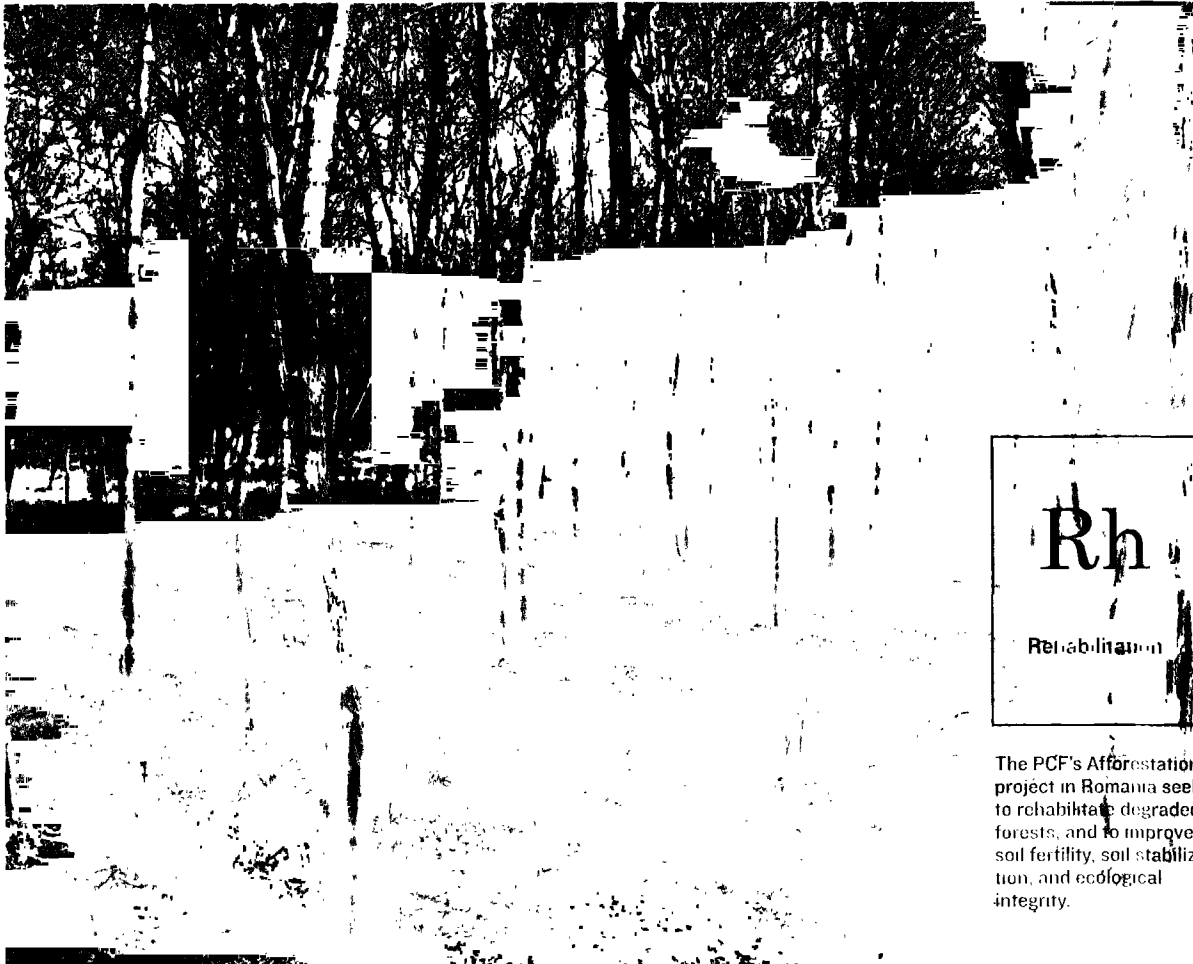
Helping developing countries to UNDERTAKE THEIR  
FIRST COMMERCIAL TRANSACTIONS for ER credits.

CONVERSATIONS WITH PROJECT MANAGERS

WHO FERNANDO CUBILLOS

WHERE CHACABUQUITO HYDROELECTRIC PROJECT, CHILE





The PCF's Afforestation project in Romania seeks to rehabilitate degraded forests, and to improve soil fertility, soil stabilization, and ecological integrity.

WHO CIPRIAN PAHONTU
WHERE ROMANIA AFFORESTATION PROJECT

The PCF's Romania Afforestation Project has several objectives in addition to achieving ERs: it will improve soil fertility, and assist in soil stabilization and ecological reconstruction. Mr. Ciprian Pahontu is the Head of the Afforestation Service, in Romania's National Forest Administration. Mr Pahontu discussed the advantages of the project:



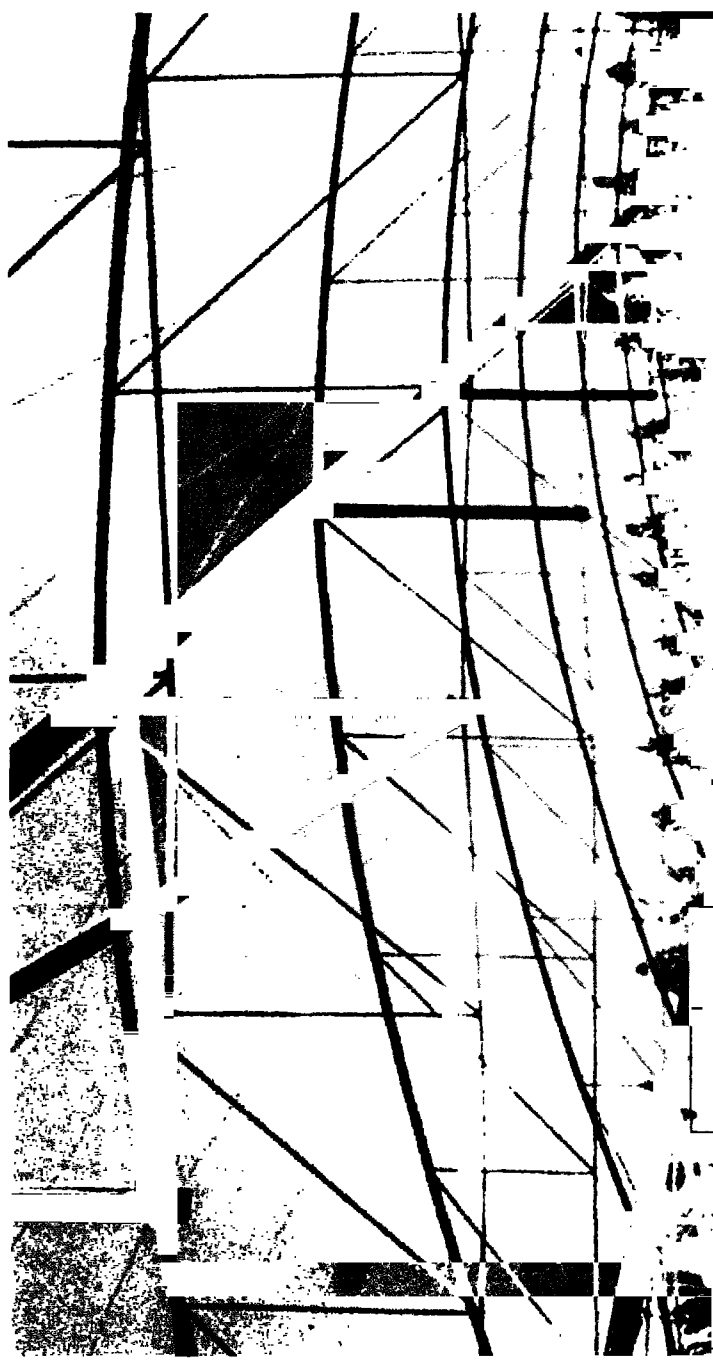
"Romania has more than three million hectares of degraded lands, the improvement and restoration of which is very difficult and expensive. In most cases afforestation is the only solution. According to Romanian statistics, the average afforestation rate of degraded lands is 345 hectares/year (an average figure for the last twelve years). Using carbon finance provided by the Prototype Carbon Fund, we will improve around 1,700 hectares/year, and we like to think that is only a beginning. Without carbon finance, Romania would only be able to improve and restore these lands at a very slow pace.

The beneficial role of the forest in maintaining a natural equilibrium is well known. In the design of this project, a high importance was accorded to biodiversity and social aspects. It was also demonstrated that the project will have a favorable impact on local communities.

I definitely believe that carbon finance is a viable financing tool to rehabilitate degraded lands on a broader scale. The experience in Romania should be useful to other countries in Europe which share this goal. The additionality principle of the Kyoto Protocol helps to promote a number of projects that without carbon finance wouldn't be viable. Let us not forget that this is a new mechanism, and the implementation and the development of the new rules needs a little time. The growth of carbon finance is limited at the moment, but I think after 2008 a significant growth will be recorded.

I would like to suggest that the PCF, as pioneers in the field, organize more workshops, seminars, and conferences in order to advance the development of all procedures needed."

# Contracting Carbon



Im

Impact

- In Brazil's Plantal project, emission reductions will be generated in three phases:
1. sequestration of carbon in eucalyptus plantations.
  2. reduction of methane produced in the charcoal process.
  3. and substitution of charcoal for coal to produce electricity.

**The basic common element of PCF transactions is the agreement to purchase greenhouse gas ERs from projects that qualify or are likely to qualify as CDM or JI projects following the entry into force of the Kyoto Protocol. Under these purchase arrangements, the PCF agrees to make payments to project entities for the delivery of ERs generated by the CDM or JI projects.**

#### **KEY ACHIEVEMENTS**

Key achievements this year in the development of legal agreements include:

- › The refining of legal documents taking into account the Marrakesh Accords as well as lessons learned through the implementation of PCF projects;
- › The negotiation of terms for ER purchase transactions for projects that include forestry components, one in Brazil (CDM), and a second in Romania (JI). This will enable the PCF to gain experience with sequestration and share the lessons learned while further modalities are still being discussed by the Parties to the UNFCCC;
- › The signing of three agreements with regional intermediaries, which aim to reduce project transaction costs as well as facilitating the identification and development of projects and the bundling of projects; and
- › Advancing the goal of standardizing PCF legal agreements.

Aside from the mechanism-specific documentation (e.g. Host Country Agreement for JI), a common set of legal documents is used for all PCF projects. These documents include a Letter of Endorsement or No Objection, a Letter of Intent, a Letter of Approval and an Emission Reductions Purchase Agreement (see Box 3.1). With the increasing experience gathered in structuring projects legally, the PCF is also currently undertaking the process of standardizing its ERPAs as far as possible. However, most agreements for the transfer of ERs are closely linked to the projects themselves and projects and project risks are not homogeneous. This makes identifying and allocating

risks in a standard method quite complex. Standardizing the ERPAs is an ongoing challenge as the PCF ERPAs are constantly adapted to reflect different project types and risks.

#### **REFINING THE LEGAL DOCUMENTS**

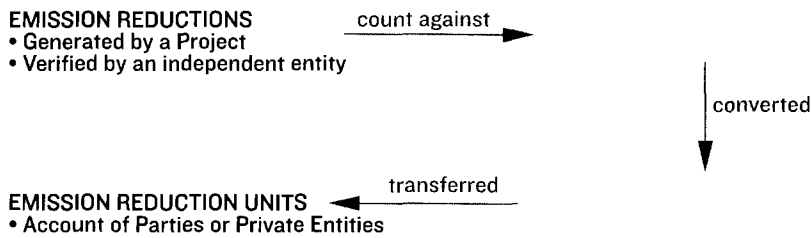
Over the last year, this basic approach has been refined to both maximize operational efficiencies and minimize risk, while maintaining sensitivity to the unique nature of the carbon market. With the increasing number of projects and additional experience gained through project development and risk management, the PCF has advanced in several key areas:

- › Principally, the PCF has developed more specific legal agreements to mitigate risks identified with individual projects.
- › The PCF has also developed an approach specifically tailored to the needs of JI projects, taking into account the unique situation of countries with economies in transition which are included in Annex I of the Kyoto Protocol.
- › By translating the provisions of the Marrakesh Accords into its agreements, the PCF has been able to make significant progress in refining its legal instruments.

In the Marrakesh Accords, the requirements for participation in CDM projects by host countries were restricted to the ratification of the Kyoto Protocol and the designation of a national authority for the CDM. Consequently, the PCF decided it was no longer necessary to enter into a Host Country Agreement with PCF host countries that meet these CDM participation requirements. The international consensus reached at Marrakesh reduces the Kyoto Protocol-related host country risks, making

figure 3.2

### THE MULTIPLE LIVES OF EMISSION REDUCTIONS



box 3.1

### PCF LEGAL INSTRUMENTS INCLUDE:

**LETTER OF PROJECT ENDORSEMENT OR NO OBJECTION:** This letter is a unilateral document issued by a potential PCF host country very early in the process of project identification. With this letter the PCF obtains the general consent from the host country for the further development of the project as a CDM/JI project. The PCF seeks to obtain such a letter when it receives a Project Idea Note on a project which is considered viable before it goes into further development.

**LETTER OF INTENT:** A Letter of Intent is signed by the potential seller of emission reductions and the World Bank as trustee of the PCF. With this document the PCF declares its intention to purchase emission reductions generated by a specific project under terms to be agreed in return for the exclusive right to contract for the purchase of emission reductions. By signing this letter the project entity commits itself to repay project preparation costs if it decides not to proceed to negotiate an Emission Reductions Purchase Agreement with the PCF Trustee in relation to the project.

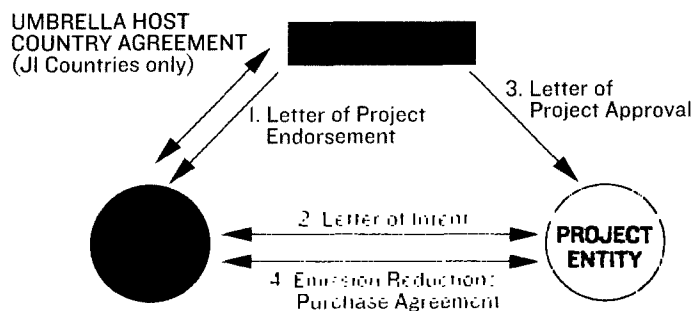
**LETTER OF APPROVAL:** With the issuance of a Letter of Approval the host country formally approves the project for the purposes of Article 6 or 12 of the Kyoto Protocol, and confirms that the project assists the host country in achieving sustainable development. A Letter of Approval is a requirement for all JI and CDM activities under the Kyoto Protocol and is therefore a prerequisite for the signing of an ERPA with the PCF Trustee.

**EMISSION REDUCTIONS PURCHASE AGREEMENT:** An Emission Reductions Purchase Agreement (ERPA) is entered into by the entity selling the emission reductions generated by the project and the PCF Trustee. Under the ERPA the project entity sells to the PCF all rights, title and interests in and to all, or a part of, the emission reductions generated by the project. The PCF Trustee commits to pay the purchase price upon delivery of the contracted amount of emission reductions generated by the project. The ERPA contains provisions on satisfactory project implementation, identifies common project risk, and requests the maintenance of insurance by the project entity.

**HOST COUNTRY AGREEMENT:** In JI countries the PCF Trustee seeks to enter into a Host Country Agreement with the host country. The agreement includes an undertaking by the host country to transfer an amount of Emission Reduction Units equivalent to the amount of emission reductions generated by a project and purchased by the PCF, from the assigned amount of the host country to the registries and accounts of the PCF participants. For the time between the project start date and the beginning of the first commitment period, the Host Country Agreement requires the host country to agree to set aside and transfer assigned amounts, as soon as legally possible, in amounts equivalent to the emission reductions generated by a project.

figure 3.1

### LEGAL AGREEMENTS FOR PCF PROJECTS



Ne

Negotiations

The World Bank's Country Director Vinod Thomas signs first Emission Reductions Purchase Agreement in Brazil with Geraldo Moura, Director/ Owner of Plantar, S.A.



Host Country Agreements for CDM no longer critical for the PCF. Instead, the host country is expected to approve individual projects through the issuance of a Letter of Approval.

Under its ERPAs, the PCF purchases ERs certified by an independent third party. In order to count against the targets of parties to the Kyoto Protocol, these ERs have to be transformed into Certified Emission Reductions (CERs) under the CDM or Emission Reduction Units (ERUs) under JI as defined under the Kyoto Protocol and the Marrakesh Accords. Once the Kyoto Protocol has entered into force CERs will be issued by the Executive Board upon receipt of the Certification Report by an Operational Entity.

In the case of projects under Article 6 of the Kyoto Protocol (JI), the host country will have to go through a process of converting ERs into ERUs (See Fig. 3.2). First, ERs generated in its territory will count against the host country's Assigned Amounts. Second, if the host country approves the project as a JI activity and agrees to transfer the ERs, it will convert an amount of Assigned Amount Units equivalent to the ERs generated by the project to ERUs. In doing so, it will mark Assigned Amount Units with a project identifier confirming that the ERs have been generated by a specific JI project. Finally, ERUs can then be transferred to the accounts of other Parties to the Kyoto Protocol and/or the subaccounts to private entities within other countries.

The PCF Host Country Agreement ensures the support of the host country for a specific JI project. With the approval of a PCF project, the host country also agrees to convert ERs generated by such a project into ERUs and to transfer them to the accounts of PCF participants. Under this Agreement the country still approves each individual project for the purposes of Article 6 of the Kyoto Protocol and authorizes the project sponsor to participate in the JI project activity by issuing a Letter of Approval for each individual project. In order to obtain the ERUs generated by a project, JI host countries agree to actively cooperate in the trans-

fer of the ERUs equivalent to the amount of ERs generated by a project. The Host Country Agreement also contains an undertaking by the host country to set aside an equivalent amount of its Assigned Amount Units as security for the delivery of the ERs purchased by the PCF Trustee through an Emission Reductions Purchase Agreement to be concluded with the project entity. So far the PCF team has negotiated or is in the process of negotiating JI Host Country Agreements with Romania, Bulgaria, the Czech Republic and Poland.

#### MAKING SMALL SCALE PROJECTS ECONOMICALLY VIABLE

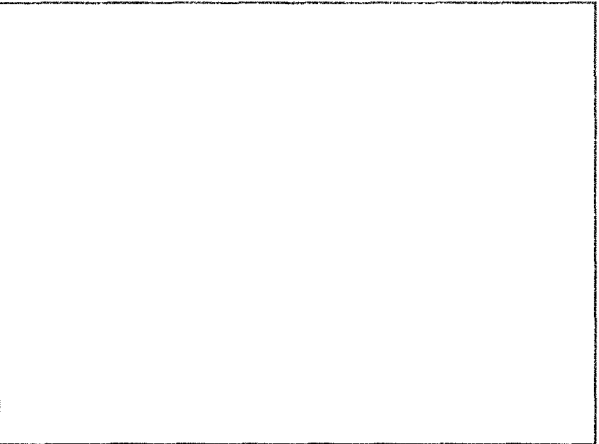
In order to further encourage the growth of the carbon market, the PCF is investigating possible ways to develop and finance small and otherwise economically unviable projects. In working through intermediaries, the PCF tries to draw on regional expertise and reduce costs with regard to the individual projects. With the preparation of a series of projects in Costa Rica and the Czech Republic, the PCF has also gained first hand experience in the bundling of small projects, developing key legal documentation to develop and underlie these arrangements.

#### LOOKING AHEAD

In the coming year, PCF will continue to improve the structuring of carbon purchase transactions:

- › The PCF will strive towards further streamlining and standardizing legal documents, and simplifying contractual arrangements as much as possible.
- › The PCF will continue to gain experience with different types of transactions, such as small projects under intermediary agreements, sequestration projects, and to the extent possible with simplified rules and procedures.
- › The PCF will continue to share the expertise gained in the process.

In addition, as the first ERs from PCF projects will become available, the PCF will address the issues of delivery and transfer of ERs to the PCF participants.



# Carbon Finance: Structuring the Deal

Le  
Leveraging

The PCF has developed the ability to structure and price transactions that share benefits and risks

**In negotiating more than a dozen transactions in the past year, the PCF has deepened its expertise in structuring carbon purchase transactions in ways that help leverage financing for the underlying projects, and that better manage risk for both the PCF and the project sponsors.**

As a key component of this process, the PCF has developed techniques for systematically evaluating risk and structuring transactions to mitigate and assign risk. These policies, drawn from best practice in the risk management industry, entail:

- › Comprehensive risk assessment through the project cycle to identify the nature and extent of risks;
- › Financial engineering and structuring of transactions to mitigate and assign elements of risk to the parties best able to assume them;
- › Pricing transactions to reflect risk; and
- › Portfolio risk management tools to mitigate specific risk and hedge systematic risk.

A recent PCF paper ("Financial Risk Assessment and Mitigation; Risk-based Structuring and Pricing." PCF Implementation Note No. 7, available on the PCF website), outlines our procedures for risk assessment, sharing and mitigation. The PCF also cooperates with key market players including CO<sub>2</sub>e.com, Ecosecurities, Natsource and Point Carbon in gathering and synthesizing market data in order to build a better understanding of prices, volumes, asset classes and market drivers.

These efforts have enhanced the ability to structure and price transactions in a way that shares benefits and risks. Below is a discussion of how these policies have been put into practice in recent transactions.

#### **RISK ASSESSMENT AND ALLOCATION**

Risk is a major factor influencing the value of ERs in each transaction. Last year's PCF

Annual Report outlined five elements of risk — project, country, "baseline," "Kyoto-Protocol-related," and market risk — and how they impact ER transactions. The PCF uses a range of risk assessment tools including: (a) financial, technical, social and environmental appraisal of candidate projects in accordance with World Bank Group operational policies, (b) monitoring the Kyoto Protocol process, as well as trends in the ER market, and (c) applying a rigorous process of validating ERs (see Chapter 5). In the past year, the PCF has refined our appraisal process to improve our ability to screen projects, reducing the cost of dropped projects. Using these tools, and assigning each type of risk to the party best able to bear it, the PCF aims to structure ER purchase transactions so that the project sponsors and their creditors assume most project and country risks, while the PCF bears market risk (i.e. volatility of ER prices) and most "Kyoto Protocol-related" and "baseline" risks.

#### **FINANCIAL ENGINEERING**

The ERPAs and intermediary agreements negotiated by the PCF in the past year contain a number of provisions that improve the risk profile for both the PCF and the project sponsors:

**The ERPA Counterparty.** Generally, the contracting party to the ERPA is the project entity. In several cases, however, the entity was not yet identified (or legally established) at the time the ERPA was required. To surmount this problem, the PCF has negotiated ERPAs in advance of identification of the project entity, enabling the sponsors to tap financing (or reduce the cost of financing) for projects:

- › *Uganda West Nile Hydropower:* The PCF negotiated an ERPA with the

	PCF Commitment in (\$000)	Price \$/tCO <sub>2</sub> e	ER Purchase 000t CO <sub>2</sub>	Capitalized Prep. Costs (max \$000)	Commis- sioning
Brazil Plantar	5,300	3.50	1,514	280	2002
Chile Chacabuquito incl option	6,690	3.5+option	1,750	117	2002
Colombia Wind – Jepirachi	3,200	3.50+0.50	800	190	2003
Costa Rica Hydro – Cote	610	3.50	173	0	2002
Costa Rica – Vara Blanca	1,000	3.50	285	0	2004
Costa Rica Wind – Chorotega	920	3.50	263	0	2004
Czech Rep. Interm. – SEF	2,600	4.00	650	n.a.	multi
Czech Rep. Interm. – CEA	2,600	4.00	650	n.a.	multi
Poland DH-Stargard	1,090	3.00	365	n.a.	2002
Poland: Pisz Biomass	570	3.00	191	n.a.	2003
Romania Afforestation	3,660	3.60	1,018	n.a.	2002
Uganda West Nile	3,900	3.00	1,300	400	tbd

Ugandan government, which incorporated it into the bid package for the issuance of a concession for providing power to a remote region. The PCF will ultimately sign the ERPA with the winning bidder. This will enable the project entity to generate ERs which will provide a stream of payments of US\$3.5m of hard currency over 16 years, a cash flow which can be used to attract financing for the project.

#### › *Czech Republic Energy Efficiency:*

The PCF is in the process of negotiating intermediary agreements with two state agencies, the Czech Energy Agency and the State Environmental Fund to deliver Subsidiary ERPAs on smaller projects. The Subsidiary ERPAs will be negotiated by the intermediaries and signed between them and the project entities. The intermediary agreement is structured so that if the projects do not deliver the required ERs, the intermediaries will negotiate additional ERPAs to meet the required levels.

**Payment on delivery.** Under all of the ERPAs negotiated this year, the PCF commits to pay an agreed price upon delivery of ERs (signified by receipt of a verification report from an independent third party), net of verification costs. In this way, the project sponsors assume the primary risk of ER delivery, while the PCF assumes price risk. The PCF will consider providing a limited amount of upfront financing in certain cases, but will generally require security and will discount the price to reflect risk.

**Seniority.** The PCF's policy is to negotiate a senior interest in the ERs it purchases. It achieves seniority by purchasing the first ERs generated by a transaction, and by overcollateralizing — i.e., purchasing less

than the full projected volume of ERs, thus mitigating the PCF's exposure to project risk while providing a commitment from the PCF to pay hard currency revenue.

**Events of Default.** Each ERPA contains a set of events of default that, if triggered, enable the PCF or the sponsor to terminate the contract and, in some cases, seek other remedies. For each deal, these events of default include:

- › Failure to deliver a minimum cumulative amount of ERs over a period of years;
- › Sales of ERs to a third party which have been pledged to the PCF;
- › Material misrepresentation and other breaches of the agreement.

**Conditions Precedent.** Each ERPA is part of a package of legal contracts related to the project. The PCF's commitment, while conditional on the effectiveness of the other contracts, can be used to secure project financing.

The PCF has developed term sheet templates outlining the key provisions of transactions, which has dramatically reduced the cost and time of structuring transactions.

#### PRICING IN PCF TRANSACTIONS

The PCF's 2001 Annual Report discussed how several generic factors influence the PCF's policy for determining the prices at which it contracts ERs:

- › Consistency with evolving market prices (see Box 4.1 for an overview of the global market to date);

- › Equitable benefit sharing;
- › Participants' willingness to pay; and
- › Coherence across the PCF portfolio.

Based on these factors, the PCF identifies a range of offered prices for ER purchases, which in 2002 was US\$3.50-\$4.00/tCO<sub>2</sub>e. Within this range, the offered price for ERs in an individual transaction depends on its structure and size, the level of risk assumed by the PCF, and additional features of the transaction (such as social or environmental benefits beyond ERs) that would command a price premium. Table 4.1 summarizes pricing for transactions executed by the PCF in the past year. Notably:

- › PCF transactions in JI countries are generally priced higher than those in CDM countries because the ERs are backed

by a Host Country Agreement and Assigned Amount Units from these countries, reducing the PCF's risk exposure.

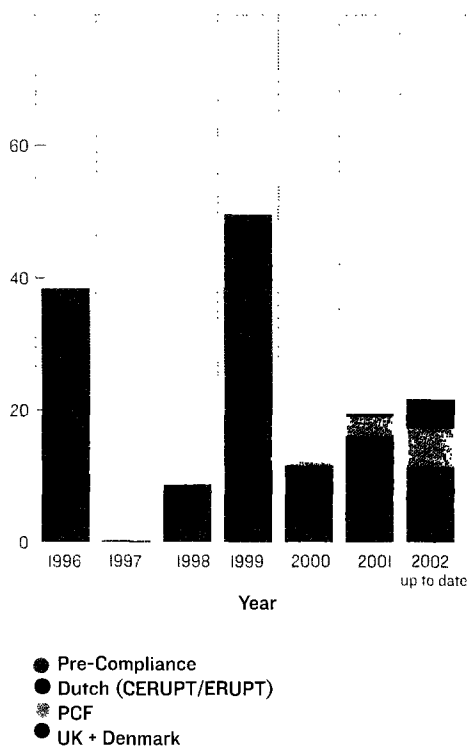
- › The projects in the Czech Republic in particular were priced higher because they are backed by intermediaries that are state agencies which assume a share of the risk of non-delivery by sub-projects, as noted above.

- › In the Colombia Jepirachi wind farm project, the PCF offers a premium of up to US\$0.50/tCO<sub>2</sub>e to the sponsor if it delivers a set of activities aimed at improving the social well-being of the local indigenous population.

- › The smaller transactions in CDM countries were priced somewhat higher than they would otherwise be given their level of risk, and did not absorb preparation costs.

figure 4.1

#### VOLUME OF TRANSACTIONS ON THE CARBON MARKET



box 4.1

#### THE GLOBAL MARKET TO DATE

After a rocky start, the global ER market appears to have gained its footing in 2002, in anticipation of the Kyoto Protocol's entry into force. Since 1996, when trading began, an estimated 200 million tCO<sub>2</sub>e (excluding post-2012 vintages) have traded in over 150 deals. Some experts forecast volumes to reach 70 Mt CO<sub>2</sub>e in 2002 (see fig. 4.1).

The early market was dominated by Canadian trades in options, but has shifted in the past year to reflect early compliance efforts of European countries, and is characterized by trading of government-backed allowances and long-term contracts for project-based ERs.

The majority of project-based transactions were priced in the range of US\$1 to US\$3.50/tCO<sub>2</sub>e. Government-backed allowance transactions, notably in the UK market, trade substantially higher, largely because of their minimal delivery risk.

Visit the PCF's website for in-depth information on price trends and other market research.

Preparation costs were generally capitalized (see Table 4.1), such that a portion of costs will be deducted from the PCF's annual payments. Other costs are borne by the PCF rather than capitalized, including administrative costs, cost write-offs for projects that default, and option premia. After taking these factors into consideration, the all-in outcome price paid by the PCF participants will be substantially higher than the contract price.

#### MITIGATING RISK AT THE PORTFOLIO LEVEL

Risk assessment, financial engineering and pricing provisions help mitigate risk at the *project* level. The PCF has also developed several tools in the past year to manage risk at the *portfolio* level. First, by purchasing from a range of projects, it diversifies away much of the unique risk of each project. Second, the PCF can exercise remedies under the ERPA if a project does not deliver the committed volume of ERs. Third, each ERPA includes a set of milestones, including at least one that occurs before the end of the PCF's investment phase (June 2004), so that if the PCF recognizes that projects are not delivering in accordance with the milestones, it could give notice to the project entity and (if the default is not remedied) reallocate PCF funds elsewhere. Fourth, to hedge against the risk of projects defaulting after June 2004, and to ensure that the participants receive adequate ERs given a limited capital base, the PCF has purchased call options. Notable transactions include:

- › The *Chile Chacabuquito Run-of-River Hydropower* ERPA provides for the PCF's purchase of a call option for ERs generated after the project has delivered the PCF's firm purchase of ERs.

- › In the *Romania Afforestation* transaction, the PCF is purchasing zero-premium call options with an out of the money strike price (i.e., substantially higher than expected market prices), on ERs beyond the contracted amount.

Fifth, the PCF has developed a Portfolio Management Model, through which it regularly monitors portfolio performance and estimates potential defaults in order to develop its hedging strategy.

#### THE IMPACT OF CARBON FINANCE

In the past year, the PCF has demonstrated innovative ways to use carbon finance to leverage private investment in climate-friendly technologies. It has shown that:

- › Carbon payments can dramatically improve the returns on climate-friendly investments, especially those involving abatement of methane emissions (or other high-potency GHGs); and
- › Even for traditional renewable energy and energy efficiency projects, the *high quality* of cash flows from carbon sales can be catalytic in helping project entities secure upfront financing.

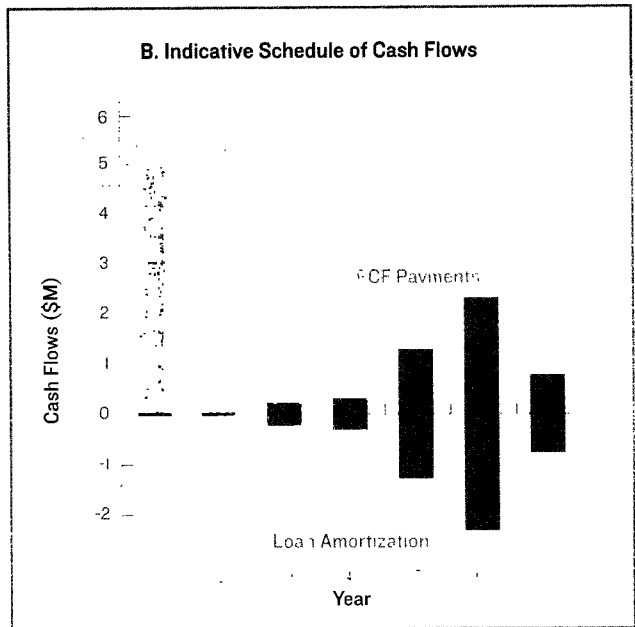
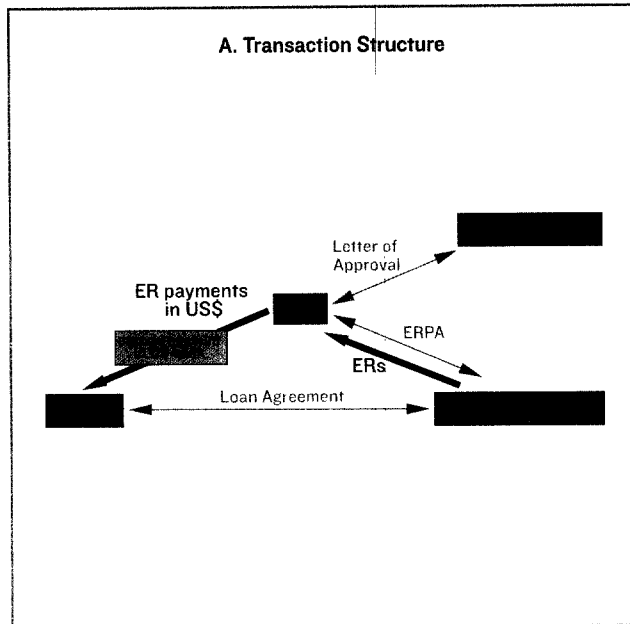
Analysis of projects in the PCF pipeline, combined with PCFplus research, has demonstrated the impact of selling ERs on a range of technologies. Projects that mitigate methane production, such as landfill-gas-based power generation, can mitigate 5 kg CO<sub>2</sub>e per kWh or more, which at US\$3/CO<sub>2</sub>e can contribute over 1.5 US cents per kWh to the project and boost internal rates of return by 5 percentage points or more. Carbon finance therefore has the potential to revolutionize solid waste management and other methane-generating businesses in emerging markets.

PCF projects in Bulgaria (Svilosa biomass) and Chile (Chacabuquito hydro).

Tr

Transactions





Revenues from carbon sales from traditional renewable energy projects are more modest, generating revenues ranging from 1/4 to 1/2 US cent per kWh (at a price of US\$3/tCO<sub>2</sub>e). The higher range would be attained in areas with very high carbon intensity, e.g., the West Nile region of Uganda where renewable energy would generally displace small diesel generation.

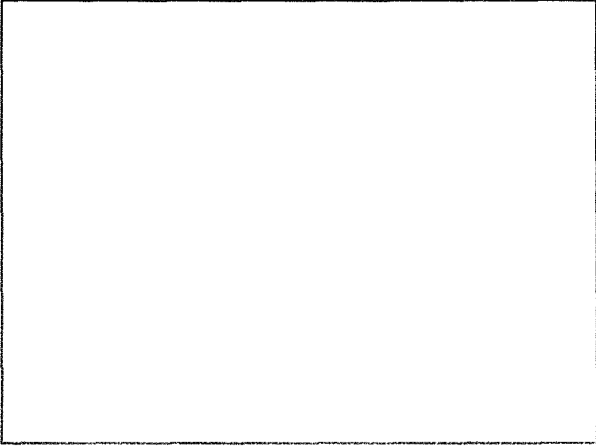
As important as the boost to revenues provided by carbon sales, is the fact that PCF commitment to pay is *US Dollar-denominated and backed by unconditional promissory notes* from the PCF participants (all of whom are of investment-grade). These features minimize cross-border, currency and transfer risk, so that PCF financing can be used to leverage project financing that would not otherwise be forthcoming.

For example, in the *Brazil Plantar Sustainable Forestry* transaction, the project sponsor was unable to obtain the medium-term financing required to execute the project. Lenders would extend loans only with country risk insurance, which was available only for short terms at high prices. Using PCF payments under the ERPA as collateral, the lender was able to extend the loan tenor from two years to five years, despite the current economic difficulties in Brazil, and eliminate the need for expensive country risk insurance (Fig. 4.2 a and b).

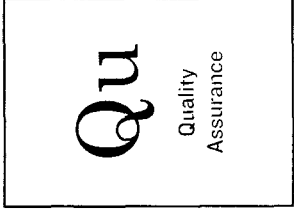
#### LOOKING AHEAD

In the coming year, the PCF will continue to improve and streamline the structuring of carbon finance transactions to leverage private investment and reduce costs. In particular:

- › The PCF will examine new ways of structuring transactions using the PCF's hard-currency cash flows as collateral for debt financing. For example, it could consider future flow transactions where PCF payments would be held in escrow as a debt reserve or sinking fund.
- › To further reduce the cost of dropped projects, it will increase upstream review of projects, in order to identify deals with major issues that would hamper a project's potential to generate ERs.
- › The PCF will continue to refine its risk assessment and mitigation tools, for example by updating the Portfolio Management Model to reflect evolving expectations of delivery of ERs under ERPAs.
- › As projects begin to deliver ERs in the coming year, the PCF will develop processes for registering and tracking expected deliveries to the participants.



# Creating the Carbon Asset



The PCF's portfolio  
includes hydroelectric  
projects in Africa and  
Latin America.





**By penetrating new markets and aiming for technological diversity over the past year, the PCF has added considerable value to its portfolio of carbon projects and further solidified its knowledge base.**

This experience confirms that the creation of a high quality carbon asset requires at least:

- › An excellent understanding of the concepts of additionality and baseline;
- › The definition and use of practical methods to determine baselines;
- › The creation of workable tools to monitor relevant data and calculate ERs;
- › Accepted procedures for project validation and verification of ERs; and
- › An excellent understanding of JI and CDM modalities and procedures.

The PCF now understands that:

- › There is not one single baseline methodology that works for all projects and circumstances;
- › Many projects require the use of several methodological elements to establish a credible baseline;
- › The baseline study and monitoring plan must be integrated to ensure project validation and verifiability of ERs; and
- › Simulation and projection of emission reductions using the monitoring plan's calculation concepts can help to identify risks under alternative scenarios.

#### **RESPONDING TO MARRAKESH**

The decisions taken by the Parties to the UNFCCC in the last twelve months have had a major impact on the PCF's work. The PCF team has closely followed and contributed to the discussions before and after the 7th session of the Conference of the Parties at

Marrakesh and, combining these insights with real project experience, the PCF has guided a number of projects successfully through the validation process. It expects that PCF projects will be among the first to be reviewed by the CDM Executive Board and that this will demonstrate the quality of our projects and the methods applied.

The Marrakesh Accords provide three approaches to baselines (See Box 5.1). Our analysis shows that the PCF's methodology is consistent with the Marrakesh JI and CDM requirements, given that the PCF establishes baselines:

- › As a scenario that is a reasonable representation of emissions that would occur in the absence of the proposed project,
- › In a transparent and conservative manner,
- › On a project-specific basis,
- › Taking into account relevant national or sectoral policies and circumstances, and
- › Using methodologies which are likely to be approved by the Executive Board.

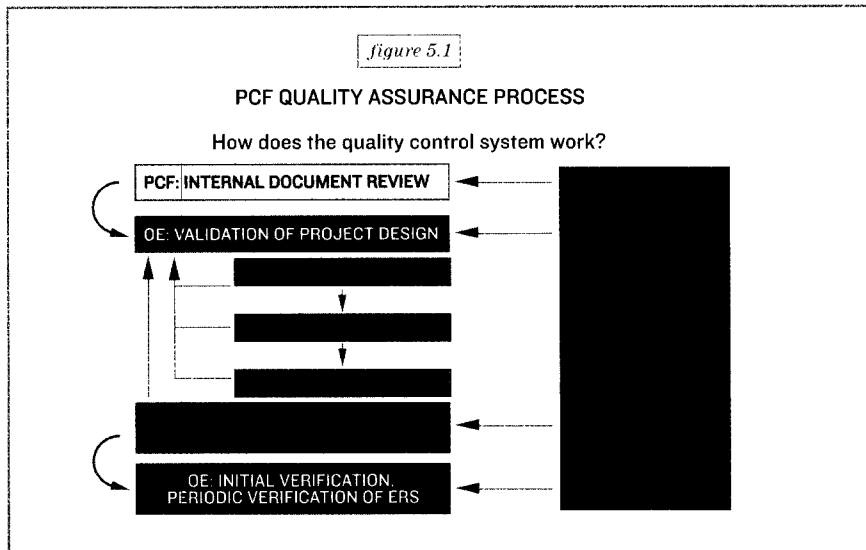
#### **BASELINES AND MONITORING FOR PCF PROJECTS**

The Marrakesh Accords define environmental additionality as the positive difference between the emissions that would have occurred without the project (baseline emissions) and actual project emissions over time. Thus, the baseline scenario is essential both from a regulatory and a business point of view. It is the most important determinant of the project's eligibility under the Kyoto Protocol and, together with the monitoring plan, determines whether a project will successfully deliver emission reductions.

BASILINE METHOD	THE BASELINE IS ...	PROJECT EXAMPLES
Investment analysis	the option with the highest internal rate of return	Latvia (Liepaja: landfill/methane capture); Romania (afforestation)
Investment analysis	the option with the highest net present value	Bulgaria (Svilosa: biomass waste)
Investment analysis	the least cost option	Poland (Stargard: geothermal), Poland (Pisz: biomass waste)
Economic analysis	the least cost option (using least cost expansion planning)	Chile (Chacabuquito: run-of-river hydro), Morocco (wind), Guatemala (El Canada)
Scenario analysis	the option with the lowest barriers (such as risks and costs)	Uganda (small hydro), Brazil (Plantar: fuel switching)
Control groups	historic trend or a peer group	Brazil (Plantar: charcoal production)

BASILINE METHOD	THE BASELINE IS ...	PROJECT EXAMPLES
Electricity Sector Baseline (economic analysis)	the electric system plus system expansion: a project is additional if production cost is higher than sector long run marginal cost	Costa Rica (Umbrella Project), Colombia (Jepirachi: wind)
Business-as-usual for small-scale projects	the business-as-usual scenario assumptions: a project is additional if impeded by barriers.	Nicaragua (rice husk to power)
Common practice for small-scale projects	the common practice in defined countries (based on observations and research results)	Mauritius (waste management)
Default baseline for project classes (multi-project baseline)	determined by a validated default method for project classes in a defined host country (based on observed behavior)	Czech Republic (district heating, demand side energy saving)

figure 5.1



The PCF continues to demonstrate the application of various baseline methods. The method selected for a particular project depends on a number of factors, including the type and size of the project, data availability, uniqueness, replicability and costs. Project-specific methods focus on a project's particular circumstances, while standard methods such as benchmarks are developed for classes of projects.

Investment analysis is still used for most PCF projects. But with growing experience and advanced international discussions, the PCF is moving towards standardization and simplification of its tool kit. The PCF realizes that there are degrees of standardization and simplification, which depend on project size and type, sector, country and other factors. And it has learned that a strict distinction between project-specific and standard baselines may not be helpful.

To date the PCF has used the project specific baseline methods (see opposite).

In the past year, the PCF baseline team had to address many questions with regard to baseline scenarios for power sector projects. In most cases, the PCF have used a least cost economic analysis for electric power projects, and although project circumstances can greatly vary, the least-cost method is often justifiable. For example:

› *Grid-connected power*: the baseline scenario is usually known to be the current power generation and distribution system plus any planned expansions, therefore a streamlined method is sufficient. Where an expansion plan exists, it may show that a proposed project is not (yet) the next least cost option. In the absence of an expansion plan, projects may be able to show that lower cost generation

In

Innovation

options are available. Where small power projects are not included in the expansion plan, they are additional if their generation costs are higher than the grid's long-run marginal costs. In all cases, the system's power dispatch indicates the power source that would have to be dispatched in the absence of the project activity.

› *Off-grid power* (isolated locations or self-generation): the baseline scenario is usually defined by the least cost power supply alternative that is available to the decision maker. Emission reductions are calculated against this baseline scenario.

For grid-connected power projects, the PCF is moving towards sectoral baseline studies, which use the same assessment framework for most projects in the country and can often be bundled under one methodological umbrella for additionality assessment and calculation of emission reductions. With a sector baseline and monitoring plan validated for the host country, adding projects becomes a simple exercise of demonstrating that the project meets the criteria of the umbrella.

In the past year, the PCF's work on methodologies and our project experience has shown again that a good monitoring plan that is integral to the baseline study is as important as the baseline assessment itself. Monitoring plans:

- › Can address problems that cannot easily be resolved in the baseline study, such as when a baseline may shift as a consequence of future regulations;
- › Often employ elements of control groups that help to further specify the baseline scenario and translate it into emissions using a monitoring and calculation concept along with conservative parameters and assumptions (the Brazilian Plantar project is a good example); and
- › Provide an explicit and a realistic link between the baseline assessment and the expected emission reductions, provided the monitoring plan's calculation concept

is used to simulate expected reductions. PCF projects do this in the Emission Reduction Study.

Thus, validated monitoring plans with their clear instructions and tools are pivotal in that they ensure the long-term environmental credibility of projects and provide a more certain basis for emission reductions purchases and subsequent performance and quality control. In PCF projects, monitoring plans are therefore incorporated into the legal documentation.

#### SIMPLIFIED METHODS FOR SMALL-SCALE PROJECTS

PCF experience in the last year has reinforced the observation that small-scale projects need streamlining and simplified methods to cope with high transaction costs and other barriers. In the past year, the PCF has begun to experiment with simplified baseline methods and monitoring concepts:

- › For a small waste management project, the commonly used technology and practice in developing countries was studied and claimed as a baseline scenario.
- › For a small biomass power project in Nicaragua, barriers to investment were identified in support of a "business as usual" baseline scenario assumption.
- › Small renewable energy projects in Costa Rica were bundled to use the same baseline assessment and monitoring concept and streamlined documentation.
- › The PCF is currently validating a default methodology for district heating and energy savings projects in the Czech Republic, which is based on observed market behavior.
- › The PCF has proposed the publication of emissions factors for national grids, calculated centrally on the basis of monitored dispatch data, which can then be used by project owners to calculate their emission reductions on the basis of their power sales to the grid.

**Working through the PCF/CDM Project Cycle is a useful CAPACITY BUILDING tool for all stakeholders.**



So

Social  
Responsibility

› In the Costa Rica umbrella projects, the PCF has determined ex ante emission reduction factors for small scale renewable energy projects, thus eliminating the necessity for central monitoring of avoided grid emissions.

› In the Nicaragua project, baseline emissions will be calculated using data from a proxy plant that is likely to represent emissions at the margin of the dispatch order.

#### **PCF QUALITY CONTROL, VALIDATION AND VERIFICATION**

The past year has seen a refinement of the PCF's quality assurance system and its closer integration with PCF and CDM/JI mandated project cycle steps. PCF methodology experts are now involved in project decisions at the earliest stage in the project cycle and provide continuous guidance in later stages. The standardization of business processes and quality control thus achieved helps the PCF to cope with a growing project volume, while at the same time applying experiences from other projects, reducing preparation time and costs,

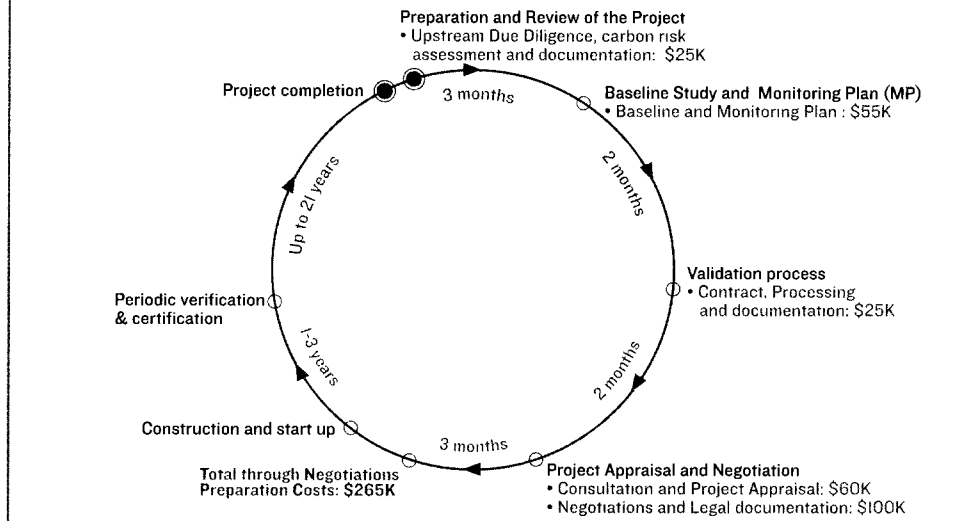
and increasing the certainty about the quality of the carbon asset at an early stage. The PCF quality assurance team reviews baseline studies, monitoring plans and emission reduction studies to ensure that they satisfy PCF standards and meet the existing Kyoto Protocol requirements, before the project is submitted to a designated operational entity for validation.

In the past year, the PCF has begun to invite stakeholder comments following the Marrakesh requirements for CDM projects. Comments were received for most PCF projects. It has documented all comments on the PCF website along with our response, and the PCF team has asked validators to take them into account.

A growing number of firms offered validation services last year. The firms that the PCF has used have consistently shown their ability to quickly identify the issues on which the credibility of a project hinges, and they have frequently requested improvements in project design and documentation. The PCF expects that they will

figure 5.2

### CARBON ASSET CREATION AND MAINTENANCE COSTS: THE PCF EXPERIENCE

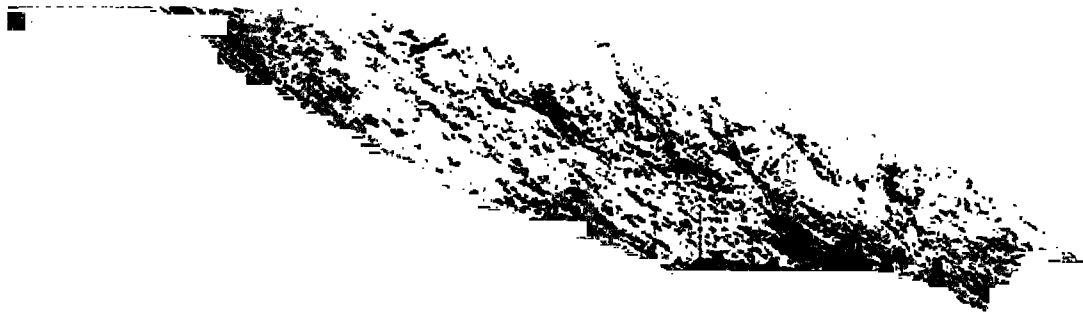


be accredited as Designated Operational Entities, which will enable them to submit our CDM projects and methodologies to the Executive Board for review.

Unique to the PCF is an "initial verification" step at the beginning of the operational phase of a project. This step confirms that the project is ready to generate and monitor emission reductions, which reduces project performance risks significantly. The PCF has recently completed its first initial verification for a project in Chile (Chacabuquito) with excellent results. It now expects that this project will be the first from which the PCF will obtain verified emission reductions.

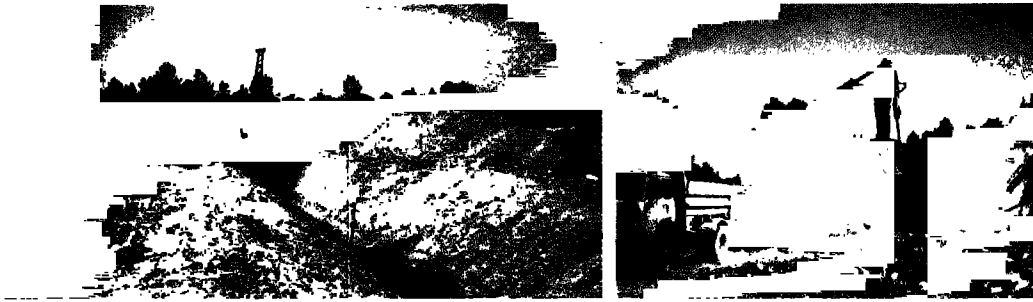
### CO-BENEFITS OF PCF PROJECTS

The World Bank as the PCF's trustee seeks to ensure that PCF projects fully abide by its ten social and environmental safeguard policies. This lends PCF projects a value beyond their benefit to the climate and a quality that often exceeds not only commercial practice but also the specific CDM or JI requirements regarding environmental impact assessment by host countries. Moreover, PCF monitoring plans routinely contain social and environmental performance indicators, which are monitored and verified and which host country authorities can use to assess the project's contribution to sustainable development.



The PCF has recently completed its first initial verification for Chacabuquito hydro (Chile).





Carbon finance can improve the viability of capturing methane from solid waste landfills, as demonstrated in the PCF project in Liepaja, Latvia.

To further enhance the co-benefits of its projects, the PCF has recently begun, on an experimental basis, to negotiate with project sponsors specific social and environmental benefits that the project must deliver to the local community. The project's monitoring and verification system is used to confirm that these benefits actually reach the community, and occasionally, PCF payments are made dependent on positive non-carbon outcomes.

This is, for instance, the case in a wind farm project on indigenous land in Colombia, where the project sponsor has agreed, in consultation with the local indigenous community, to implement a series of community-driven activities, including the construction of a desalination plant, and the rehabilitation of health and educational facilities. In another example involving the Brazilian Plantar project, the monitoring plan contains indicators for workers' health and forest protection.

### CARBON ASSET CREATION AND MAINTENANCE COSTS

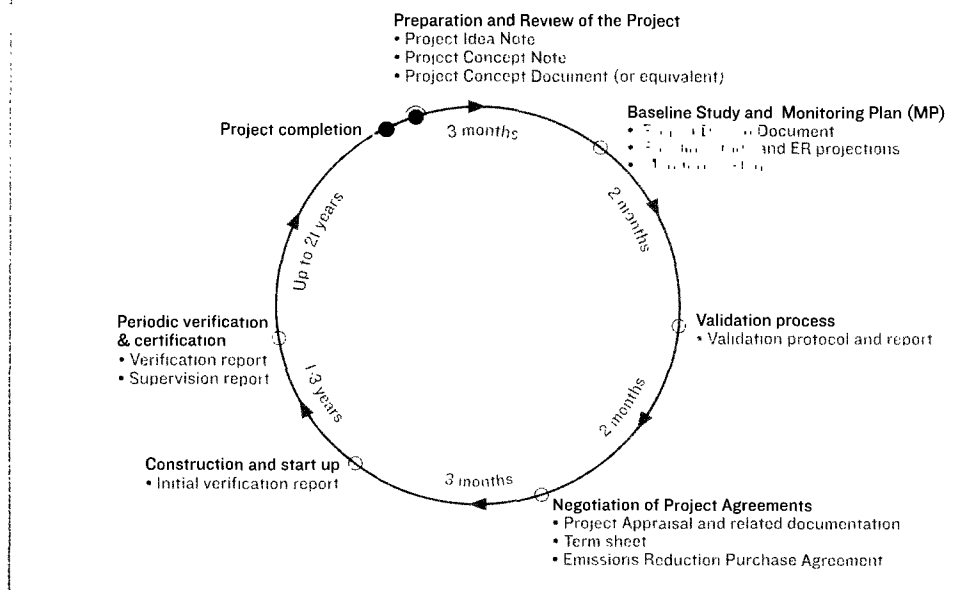
The PCF FMU closely monitors the time required and the costs incurred to prepare PCF projects and succeeded in the past year in bringing some of these costs down, as project experience grew and procedures became more standardized and/or streamlined.

The time it takes for a project to go through the entire PCF project cycle varies greatly, reflecting the variety of project types, their novelty, sizes, circumstances, and countries, and the complexities of establishing a baseline as well as the preparedness of the sponsor and project.

For instance, the Brazil Plantar project is comprised of several components within one project, each of which necessitated a separate baseline assessment and monitoring concept. Umbrella projects such as those in Costa Rica and the Czech Republic

figure 5.3

### PCF/CDM PROJECT CYCLE — The Manufacturing Process For CDM/JI Emissions Reductions





## Growth

tend to be more time demanding and costly in the design stage than regular projects. Projects with long preparation times are also more susceptible to changing project circumstances.

However, the PCF is now beginning to see some repetition in project types and baselines, monitoring and other project cycle issues. It has also developed a better understanding of concepts and procedures, which leads to a more rapid drafting of project documents and a faster overall processing of such PCF projects.

This effect is to some extent being offset by an increase in project work that is not directly related to the carbon component, such as financial and social/environmental due diligence and World Bank processing of a transaction. In some instances, such as the Brazil Plantar project, it has been necessary to assist in the financial structuring of the underlying project.

The overall effects on costs of these trends are mixed. While project preparation costs are somewhat lower overall than in the previous year, there have been remarkable shifts in the distribution of cost to the various project cycle steps. Current experience shows that the CDM-mandated project requirements do not impose dominant costs in comparison with more traditional functions such as investment appraisal, legal review and contracting. The PCF has also seen that front-end project preparation costs are going up, while downstream appraisal costs are falling. This trend is likely to continue as larger volumes of high quality projects are evaluated in shorter amounts of time, and as more technical assistance will be needed to access difficult projects, which is expected as the market matures.

Little experience exists yet with the project performance monitoring and the verification process. Monitoring and verification costs are mostly absorbed by the project entity, but cost risks cannot be excluded. The PCF may, for instance, have to assist



some project entities with putting in place the monitoring system and with preparations for verification. The PCF tries to maintain low monitoring and verification costs by aligning the monitoring plan with the performance monitoring and quality assurance system of a well-managed project. However, verification activities may also have to be more frequent in the early years of a project's life, and costs will depend on the emergence of accredited local verification capacity.

#### LOOKING AHEAD

Over the coming year, the PCF expects to gain significantly more experience in the creation of high quality carbon assets. It expects that next year's knowledge creation will lead to a much better understanding of several new classes of projects, such as demand-side and energy conservation projects and a variety of small scale projects. This will involve the development of several new baseline methods and innovative research to further enhance the quality of PCF projects while reducing costs.

The main challenges which the PCF team will face next year are:

- › The development of baseline and monitoring methods for new and more complex types of projects;
- › The interpretation and integration into the PCF's methodologies and project cycle of the modalities and procedures for JI and CDM projects that the UNFCCC Parties and the Executive Board agree upon;

- › The implementation of an orderly monitoring process for PCF projects, its integration with project supervision and the first rounds of verification of ERs; and

- › The creation of training material to provide methodological assistance and training for PCF partners and host countries.

Given the need to further reduce the burden of transaction costs, in particular on small projects, the PCF will continue to explore cost reduction measures to enable small projects to compete with high-volume, low-cost transactions. It intends, for instance, to:

- › Make full use of the emerging modalities and procedures for small-scale CDM projects and to contribute to their further development;

- › Develop standard methods and formats that streamline and accelerate the project preparation process, and create replicable models that make projects more accessible;

- › Contract with additional intermediaries to bundle small projects under common methodological and procedural umbrellas; and

- › Work with host countries and other market participants to improve capacity and deliver technical assistance with a view to achieving cost reductions.

The PCF will continue to share insights from projects and development activities through presentations and discussions in a variety of fora and through submissions to the CDM Executive Board and other UNFCCC entities.

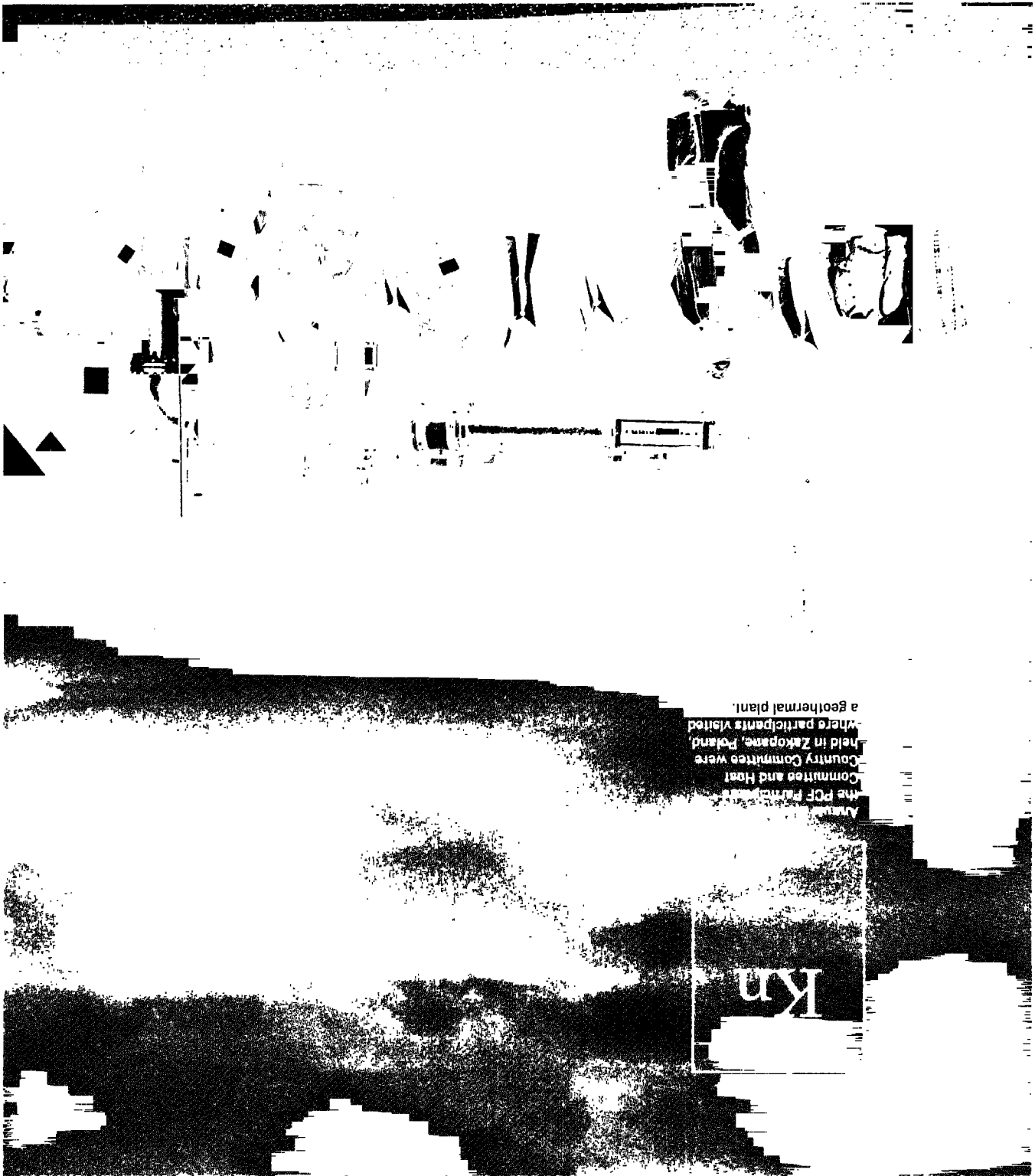
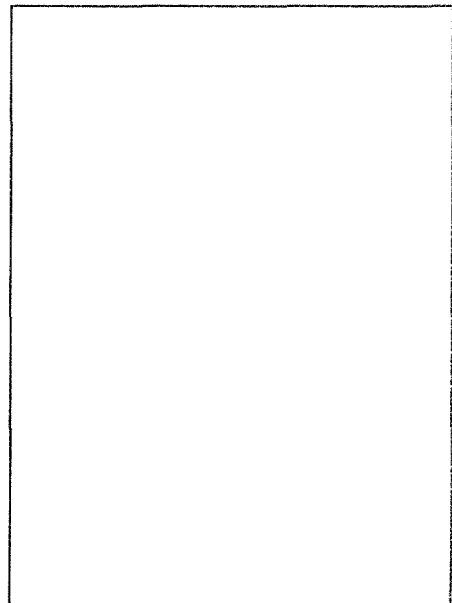
The PCF's project in Mauritius will help the country to manage its solid waste and will substitute some fossil-fuel generation.



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# Creating and Sharing Knowledge and Capacity



At the top left, participants in the PCF Partnership Country Committee and Host Country Committee were held in Zakopane, Poland, where participants visited a geothermal plant.

km

**During the past year, the PCF has become one of the standard references and a primary source of information for all actors in the carbon market. The procedures, documentation and methodologies developed by the PCF are helping to structure CDM and JI projects and carbon transactions beyond the PCF.**

The generation and dissemination of knowledge for the benefit of the wider CDM/JI community is one of the key objectives of the PCF. This objective is being pursued through the transparent operation of the Fund and disclosure of information on the PCF website, through PCFplus Research and Training activities and through PCF Fellowships. In addition, PCF knowledge is shared and disseminated through public events at UNFCCC conferences, in meetings with the participants, host countries, and other stakeholders, as well as in major global fora.

#### LEARNING

PCF participants are in a privileged position to take full advantage of "learning by doing" offered by the PCF as they have wider access to information on projects, technologies and purchase terms. Indeed, PCF participants have increasingly started to utilize the knowledge gained through PCF projects in their own carbon strategies and in the development of their businesses at home and abroad. For example, some participants are now systematically reviewing their own project portfolios and identifying the benefits of carbon financing in driving more climate-friendly solutions to the market in key sectors of developing economies.

By penetrating new markets and aiming for technological diversity, PCF project activities have allowed an increasing number of host countries and the private sector to benefit from the most powerful form of knowledge dissemination, capacity building and learning: the development and implementation of a real CDM or JI project. Often, such projects are the first in the country or in the particular sector. This approach of "learning by doing" is often more effective than traditional capacity building, since it is the

host country or the private sector that takes the initiative to develop and implement projects that lead to emission reductions, and enjoys access to the expertise of the PCF team throughout the project's lifetime.

The PCF has also continued to share knowledge gained in the course of the Fund's operations, with UNFCCC Parties and the CDM Executive Board. The past year has been the first to see practical application of the decisions adopted in Marrakesh, at the 7th session of the Conference of the Parties to the UNFCCC. In addition to bringing an increasing number of projects and accompanying methodological work to the validation stage, the PCF's Fund Management Unit has actively contributed to the work of the CDM Executive Board and its technical panels. The PCF is also likely to be among the first to submit, through Operational Entities, projects for registration as CDM projects.

#### WEBSITE

The PCF website is the main and most frequently used channel for dissemination of PCF information and knowledge. Its key feature is the document library, which is accessible to the public. In addition, a private domain accessible only to Participants contains detailed project information, some of which becomes public after final project approval. All PCFplus Research reports and key training materials are available on the website. The website is also used to receive project proposals, questions and public comments on PCF projects in validation.

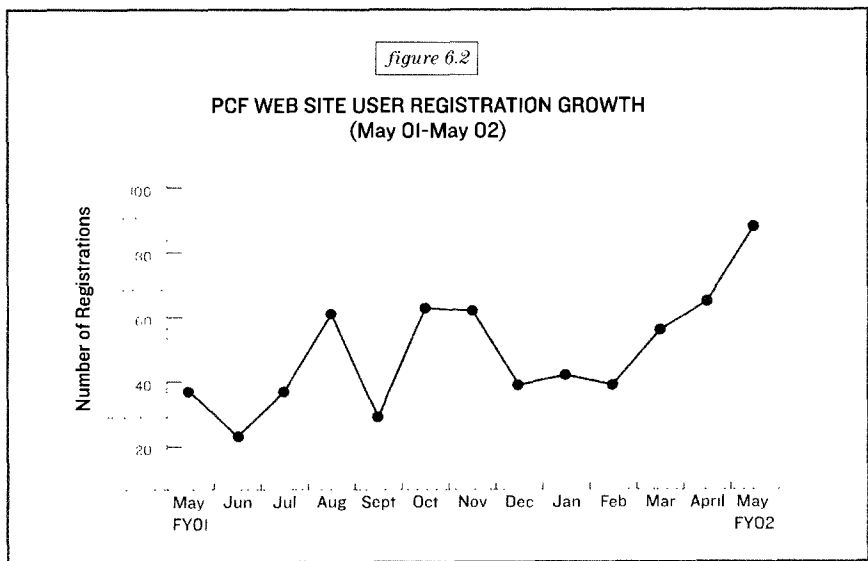
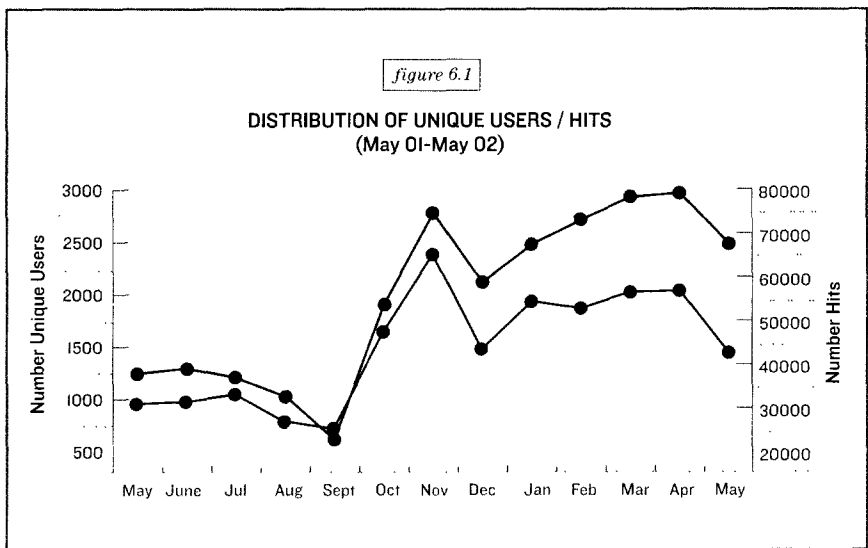
The PCF website was dramatically re-engineered during the spring of 2002. The new site was launched in April with upgraded and redesigned features to enhance its navigation, cataloguing and search functions ensuring that its users can locate needed documents easily and quickly. A PCF Help

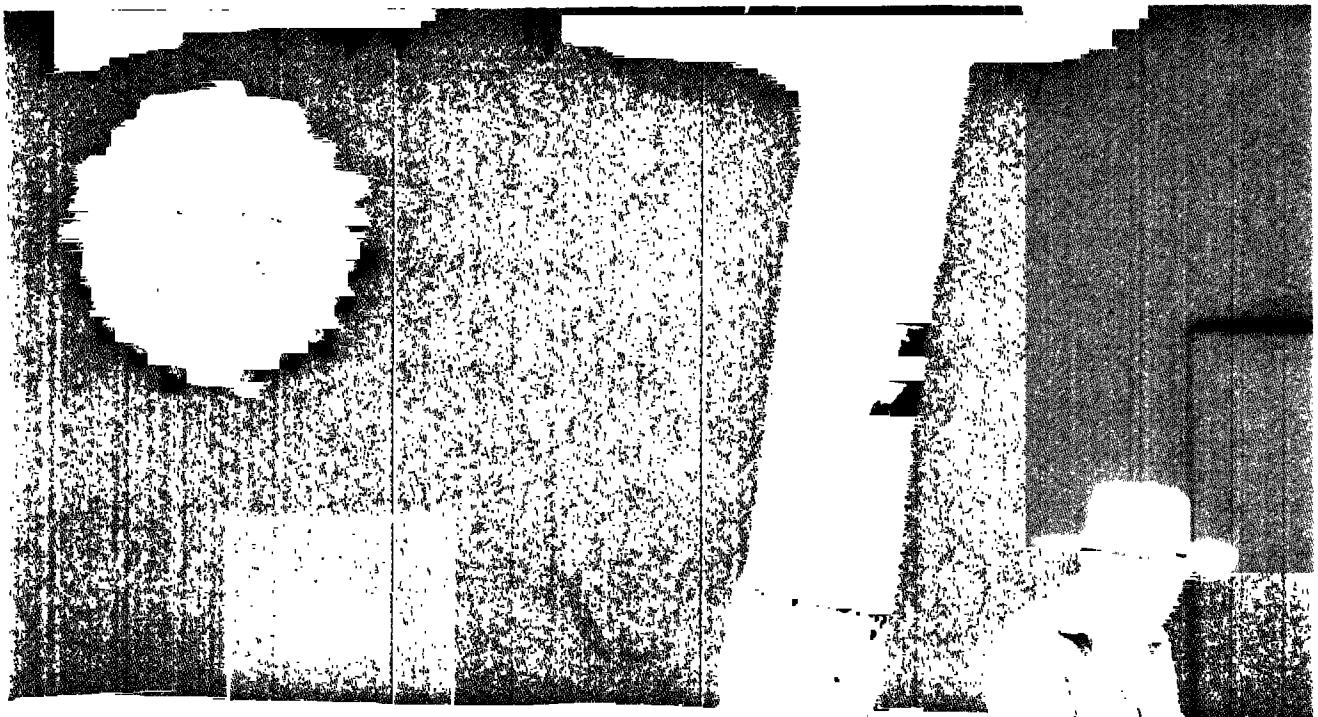
Desk was also established through the web site to answer questions on PCF and carbon finance operations and to design and create a data base of frequently asked questions and their answers. During this year, the website has averaged 173 visits per day, and has been visited by over 20,000 users, of which over 5,000 became repeat users.

To compensate for many web users' lack of broadband access to the PCF site, CDs of the website can be ordered as needed and are made available to host country and former trainees of World Bank Institute/PCFplus workshops. Some materials are already available in Japanese, Spanish and French and the range of materials available will continue to grow in volume and diversity during the next year.

#### TRAINING

In order to complement its "learning-by-doing" approach, the PCF has entered into a partnership with the World Bank Institute — the learning arm of the World Bank — to implement the PCFplus Training Program. This program is designed to respond to host countries' training needs to enable them to identify, formulate and implement projects that will deliver emission reductions that can be purchased either by the PCF or other carbon financiers. The program promotes knowledge and learning to experts from both the public and the private sector, increasing their capacity to identify and facilitate carbon financing, and to implement each step of the CDM/JI project cycle. Whenever possible, training events are regional in scope to promote dialogue





Renewables

among regional experts, and are designed in cooperation with local partners to ensure that they address the needs of the target countries.

Last year was the first full year of implementation of the PCFplus Training Program. In all, six major training workshops were held: three in Central and Eastern European Countries, and one each in Central America, South East Asia/Pacific, and the South African region. In order to disseminate knowledge more effectively, cooperative efforts were launched with third party trainers from developing countries, with the World Bank's National Strategy Studies (NSS) team, and with a regional development bank. The workshops were attended by 265 public and private sector officials from 28 countries as well as by representatives of 10 PCF participants, for a total of 832 training days. In addition, training was provided to World Bank staff on the integration of carbon finance in World Bank operations.

During the past year, a programmatic approach was adopted for the PCFplus Training Program, whereby an increasing number of standard training modules were developed, facilitating their posting on the PCF website, and their translation to Spanish.

#### RESEARCH

CDM and JI projects are a complex business. The research component of PCFplus seeks to address some of its complexities by drawing upon and illuminating lessons from the PCF's pioneering activities. While mostly carried out by experts around the world, PCFplus Research is administered by the World Bank's Research Group, which provide extensive expertise in various relevant topics. The research is primarily focused on "nuts and bolts" issues, such as baseline design, and on the development of the carbon market. Completed studies are made available on the PCF website, and are utilized frequently in implementation of PCF projects and in PCFplus Training.

Over the last year, PCF plus Research has added five studies to its arsenal:

- › "Baselines for Energy Efficiency Projects Addressed Through Energy Efficiency Intermediaries,"
- › The second and third reports of the "Market Intelligence Study" (national and international regulations),
- › "JI in the Context of EU Accession" and
- › "Applying Sustainable Development Criteria to CDM Projects: The PCF Experience".

## CONVERSATIONS WITH PCF FELLOWS

WHO HORST MEYRAHN

WHERE RWE RHEINBRAUN AG

Horst Meyrahn came to the PCF as a visiting fellow from the environmental protection department of RWE Rheinbraun AG (RWE Group's power production unit, based in Cologne, Germany). Horst was with the PCF from April to July 2002. His time with the PCF was intended to provide him with a deeper insight into the organization and process of achieving project-based greenhouse gas emission reductions.

Horst describes his experience in his own words:

"After a starting phase in which I got an overview of the numerous PCF projects and project-related activities I participated in some aspects of the PCF's 'daily work' (e.g. selection of validators, baseline consideration, evaluation of forestry projects, presentation of PCF's work at international conferences). I appreciated very much the collegial atmosphere within the PCF team and the willingness to answer my many questions – especially when taking into account that everybody is extremely busy. My visiting fellowship provided me with a lot of new know-how. I learned that even under the many uncertainties of the evolving Kyoto regulations JI and CDM projects are practicable and manageable. In my view a PCF fellowship is a great opportunity and I would therefore recommend it to others.

WHO GRACE AKUMU

WHERE CLIMATE NETWORK AFRICA

Ms. Grace Akumu came to the PCF under the PCF Plus Fellowship Programme from an Environmental NGO, Climate Network Africa, Nairobi, Kenya. Ms. Akumu was previously a member of the PCF-Technical Advisory Group (PCF-TAG) from 1999-2001 and participated in the early PCF-NGO consultations.

Below is an excerpt of Ms. Akumu's experience with the PCF:

"My three months fellowship at the PCF has been a worthwhile experience. Other than contributing to the Distance Learning training programme for African Host Countries, I am preparing and organizing the PCF/NGO consultations during the UNFCCC-COP8 Conference, New Delhi, India. I have valued other in-house training and capacity building provided by the PCF's very knowledgeable experts – for example in baseline construction under different scenarios, determination of additionality, monitoring and verification, procedures for project validation and calculation of emission reductions. As a learning-by-doing strategy, I was impressed and very satisfied with the knowledge gained through the two Project Idea Notes (PINs) which I submitted to the PCF, in order to assist in my training and capacity building.

I also had the opportunity to discuss with the management ways to enhance discussions and consultations with the host countries and in particular, host country NGOs, in order to share information with regard to projects and policy formulation. I have discussed too, the issue of capacity building as a continuous process and the possibility of capacity building/ training workshops (in English and French) for the PCF and the new carbon fund initiatives of the World Bank so that African stakeholders can catch up with these new developments.

I must congratulate the PCF Team for the excellent working relations, and the collaborative and team spirit of every staff member."



DBSA group: Under the PCFplus program, the PCF provides training on the design, formulation, and implementation of CDM/JI projects to host countries and partners, such as the Development Bank of South Africa, shown above.

In Colombia's Jeparachi wind power project, the project sponsor will implement a series of community-driven activities, such as the construction of a desalinization plant and the rehabilitation of health and educational facilities, which will benefit the local indigenous community.



In addition, a study on how to streamline small-scale CDM project procedures, an update on the state and trends of the carbon market, the development of a baseline analysis tool, and a study on the electricity sector baseline in El Salvador were initiated.

#### FELLOWSHIPS

The PCFplus Fellowship Program enables senior staff of PCF host countries, PCF participants and important partner institutions (e.g., regional development banks) to contribute their experience and insight to PCF implementation and to learn from direct involvement in the development and management of PCF activities. The fellowships also enhance the capacity of the fellows and their organizations to identify, plan and negotiate CDM or JI projects and to benefit from the opportunities of the carbon market.

The goals of fellowships are facilitated by the fact that fellows are based in the PCF Fund Management Unit and engage in day-to-day activities as members of the PCF core team. The fellowships vary in length from a few weeks to several months. Since the inception of the Fellowship Program in

October 2000, 10 individuals from host countries, NGOs or partner institutions and 7 individuals from PCF participants have benefited from the fellowships. Encouraged by the positive feedback from the fellows, the program will be continued during the next year.

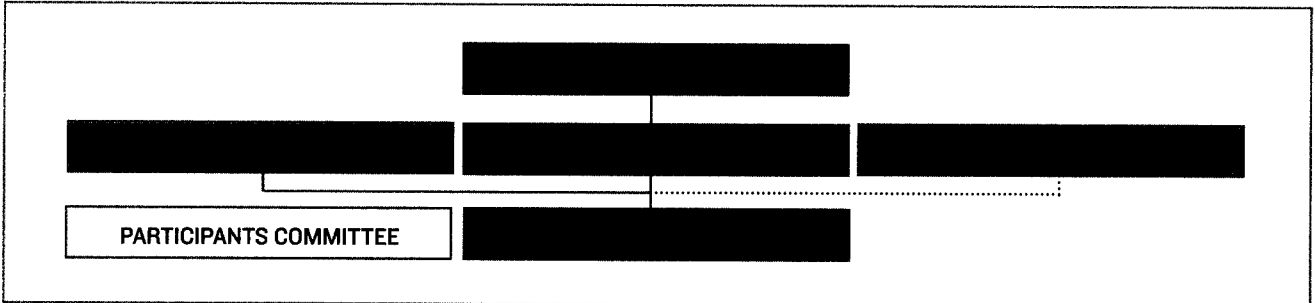
#### AHEAD

In the coming year, the PCF will advance its ongoing goals, providing a global forum for expanded knowledge sharing by:

- › Enhancing the functionality and usefulness of the PCF website and ensuring it is continuously updated with an increasing number of project documentation, such as Project Design Documents, baseline studies and monitoring plans. These will be posted on the public domain of the website.
- › Enhancing the dissemination of PCFplus Research reports and doubling the number of training days provided under the PCFplus Training program.

Disseminating knowledge gained through  
our PROJECT EXPERIENCE is one of the PCF's  
most important functions.

# PCF GOVERNANCE



Members of the Fund Management Committee are drawn from the entire World Bank.

Shown here are: David Freestone, Chief Counsel, LEGEN; Susan G. Goldmark, Sector Manager, LCSFE; Henk Busz, Sector Manager, ECSIE; and Arun Sanghvi, Lead Energy Specialist, AFTEG.



## FMC COMMITTEE MEMBERS

**HENK BUSZ**  
Sector Manager,  
Infrastructure &  
Energy Service Department

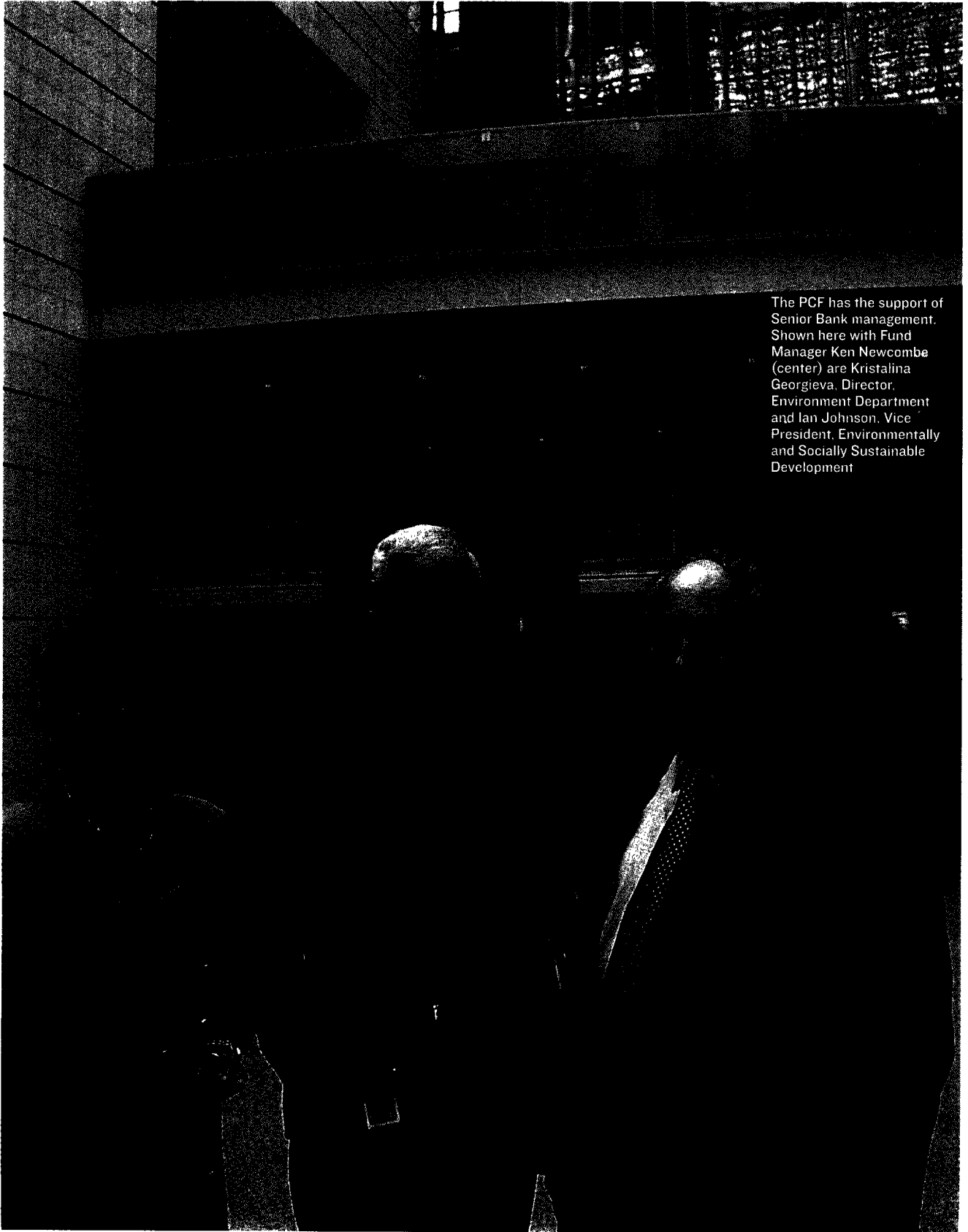
**DENIS J. CLARKE**  
Chief Investment Officer,  
Power Department Investments,  
International Finance Company (IFC)

**DAVID FREESTONE**  
Chief Counsel, ESSD & International Law

**SUSAN G. GOLDMARK**  
Sector Manager, Energy Cluster

**KEN NEWCOMBE**  
PCF Fund Manager

**ARUN P. SANGHVI**  
Lead Energy Specialist, Energy Unit



The PCF has the support of Senior Bank management. Shown here with Fund Manager Ken Newcombe (center) are Kristalina Georgieva, Director, Environment Department and Ian Johnson, Vice President, Environmentally and Socially Sustainable Development

**KEN NEWCOMBE**  
Fund Manager

**NOREEN BEG**  
Sr. Environmental Specialist

**VERONIQUE BISHOP**  
Sr. Financial Specialist

**MARITZA BOUJORGE**  
Program Assistant

**BENOIT BOSQUET**  
Natural Resources  
Management Specialist

**ROBERT CHRONOWSKI**  
Consultant

**CHARLES CORMIER**  
Senior Training Specialist,  
World Bank Institute

**EDUARDO DOPAZO**  
Consultant

**FRANCISCO FERNANDEZ-ASIN**  
Energy Specialist

**DAVID FREESTONE**  
Chief Counsel

**ANITA GORDON**  
Consultant

**SANDRA GREINER**  
Consultant

**MINA GULI**  
Counsel

**JOHANNES HEISTER**  
Sr. Environmental Economist

**MANABU HIRANO**  
Senior Engineer

**ALEXANDRE KOSSOY**  
Consultant

**FRANCK MICHEL LECOCQ**  
Economist, PCFplus Research

**TERESITA MACANLALAY**  
Program Assistant

**SUSHILA MAHARJAN**  
Consultant

**JUNJI NAKANISHI**  
Sr. Operations Officer

**BEATRICE OWOLABI-JOKOH**  
Resource Management Analyst

**CHANDRA SHEKHAR SINHA**  
Sr. Environmental Specialist

**JASON STEELE**  
PCF Website and Helpdesk

**CHARLOTTE STRECK**  
Counsel

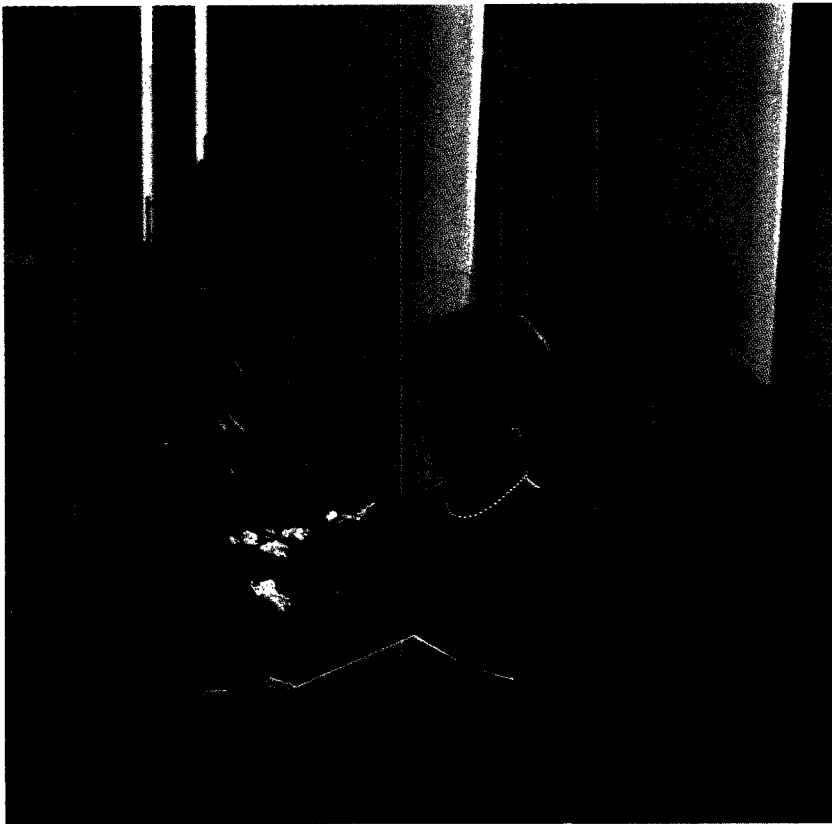
**CAROLINE VAN TILBORG**  
Sr. Financial Specialist

**HANNEKE VAN TILBURG**  
Sr. Counsel

**ODIL TUNALI PAYTON**  
Environmental Specialist

**JARI VÄYRYNEN**  
Operations Analyst

**CYNDY WILSON**  
Consultant



**FELLOWS AND TRAINEES FROM  
AMONG OUR PARTICIPANTS AND HOST  
COUNTRIES INCLUDE:**

GRACE AKUMU, Climate Network Africa

AYITE-LO AJAVON, Togo

ANA MARIA BIANCHI, Argentina

EDUARDO DOPAZO, Guatemala

CHRISTINE FEDIGAN, Gaz de France

SALEEMUL HUQ, Bangladesh

MASAYA INAMURO, Mitsui

YENI KATSARSKA, Bulgaria

MARCEL JEUCKEN, Rabobank

MARIO TORRES LEZAMA, Nicaragua

EGBERT LIESE, Government of the  
Netherlands

HORST MEYRAHN, RWE

JAN PRETEL, Czech Republic

ILZE PURINA, Latvia

ROB SHORT, Development Bank of  
Southern Africa (DBSA)

HANNE SIIKAVIRTA, Fortum

LARS SØRENSEN, Statoil

DAISUKE TSUCHIYA, Kyushu Electric

TOMMI TYNJÄLÄ, Government of Finland



## GLOSSARY

The quantity of greenhouse gases that an Annex I country can release in accordance with the Kyoto Protocol, during the first commitment period of that protocol (2008-12).

The emissions of greenhouse gases that would occur without the contemplated policy intervention or project activity.

Resources provided to projects generating (or expected to generate) ERs, in the form of the purchase of such ERs.

A unit of ERs issued pursuant to the CDM, equal to one metric tonne of carbon dioxide equivalent.

The mechanism provided by Article 12 of the Kyoto Protocol to assist developing countries in achieving sustainable development by permitting industrialized countries to finance emissions-avoiding projects in developing countries and receive credit for doing so.

The measurable reduction of releases of greenhouse gases into the atmosphere from a specified activity or over a specified area, and period of time.

A unit of ERs issued pursuant to JI, equal to one metric tonne of carbon dioxide equivalent.

According to the Kyoto Protocol articles on the CDM and JI, ERs must be additional to those that otherwise would occur. Environmental additionality is established when there is a positive difference between the emissions that occur in the baseline scenario, and the emissions that occur in the proposed project.

PCF Committee comprised of five members, consisting of the Fund Manager and four other members of the management of the International Bank on Reconstruction and Development (IBRD) selected by the President of the IBRD. The FMC is responsible for overseeing the operations of the Fund.

Unit headed by the Fund Manager and responsible for the day-to-day operations of the Fund.

The six gases listed in Annex A of the Kyoto Protocol which are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>).

ERs of a sufficient quality so that, in the opinion of the Trustee, at the time a project is selected and designed, there will be a strong likelihood, to the extent it can be assessed, that PCF participants may be able to apply their share of emissions reductions for the purpose of satisfying the requirements of the UNFCCC, relevant to international agreements, or applicable national legislation.

The annual return that would make the present value of future cash flows from an investment (including its residual market value) equal the current market price of the investment. In other words, the discount rate at which an investment has zero net present value.

Mechanism provided by Article 6 of the Kyoto Protocol, whereby an Annex I country may acquire emission reduction units when it helps to finance projects that reduce net emissions in another industrialized country (including countries with economies in transition).

A set of requirements for monitoring and verification of ERs achieved by a project.

An independent third party accredited by the CDM Executive Board.

A brief description of a project prepared by the project entity or intermediary that is to be presented for consideration by the PCF's Fund Management Committee and the Participants' Committee.

A project-specific document required under CDM which will enable the OE to determine whether the project (i) has been approved by the parties involved in a project, (ii) would result in reductions of greenhouse gas emissions that are additional, (iii) has an approved Baseline and Monitoring Plan.

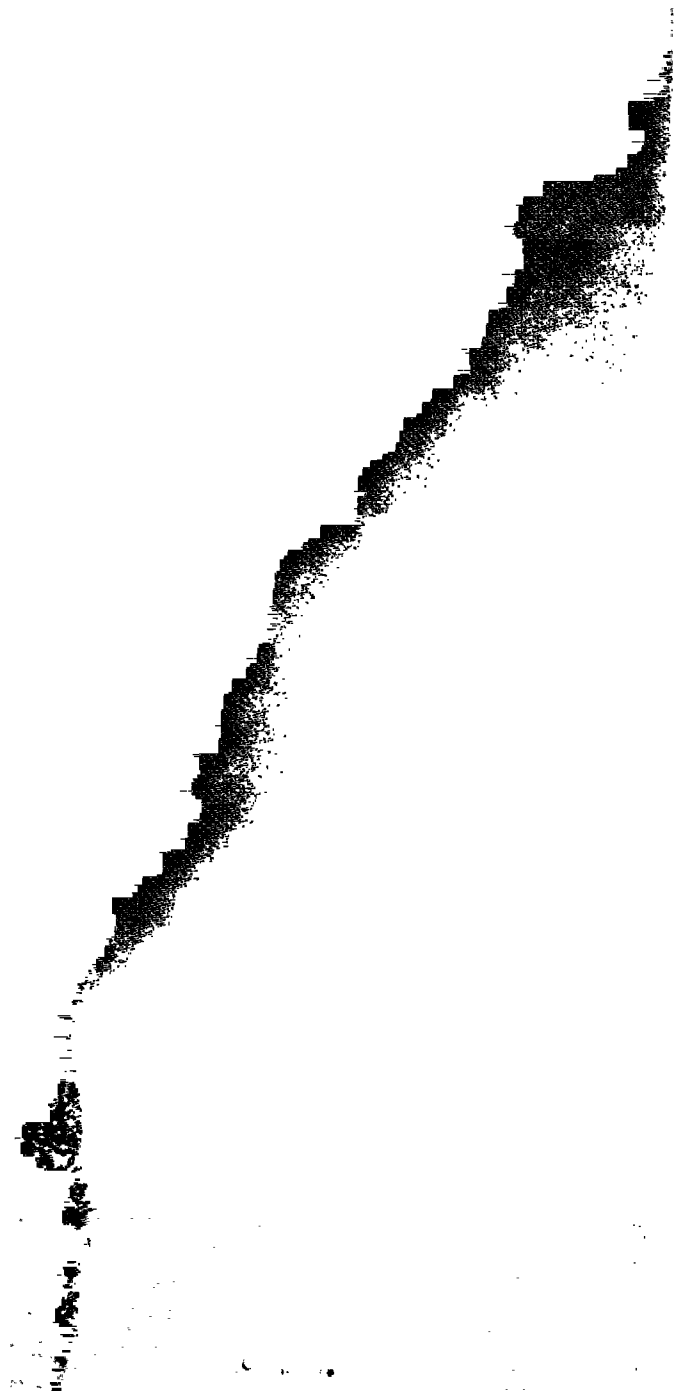
The formal acceptance by the CDM Executive Board of a validated project as a CDM project activity.

The multilateral treaty adopted in June 1992 that commits Parties to stabilize anthropogenic (i.e., human-induced) GHG emissions to levels that would prevent dangerous anthropogenic interference with the climate system. In December 1997, the Parties to the UNFCCC adopted the Kyoto Protocol.

The assessment of a project's design, including its baseline, before the implementation of the project against the requirements of the CDM, by an independent third party.

A report prepared by an OE, or in absence thereof by another independent third party, pursuant to a Verification process, which reports the findings of the Verification process, including the amount of reductions in emission of GHGs that have been found to have been generated.





Pr  
Progress

The PCF continues to work towards a sustainable future,  
through shaping the emerging CARBON MARKET  
for high quality emission reductions.



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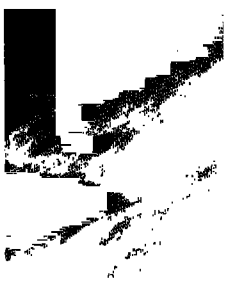
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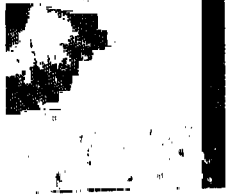
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The PCF continues to work towards a sustainable future,  
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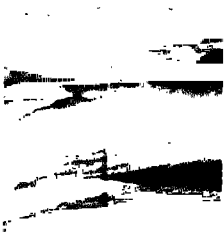
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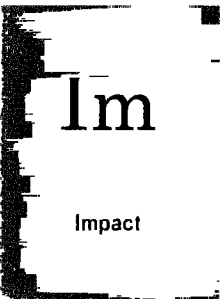
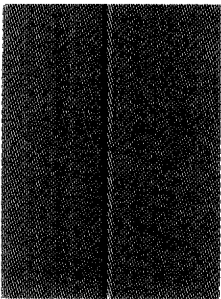
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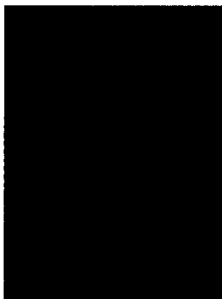
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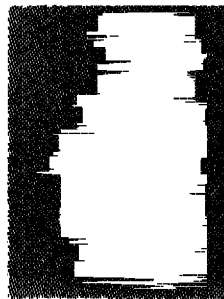
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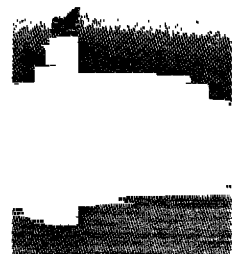
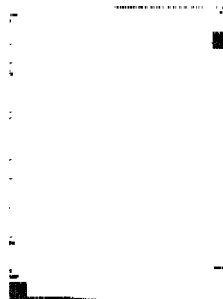
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