UNEP RISØ CENTRE
ENERGY, CLIMATE AND SUSTAINABLE DEVELOPMENT

UNEP

Gale Force Winds of Change

As governments and the international community move towards a new climate agreement in 2009, the gale force winds of change in 2008 will continue to be felt. Although the financial crisis and the ensuing global economic slowdown may impede a number of actions to address serious issues such as climate change, they also present an enormous opportunity to pursue a different economic and environmental path.

This can only happen, however, if global business and governments pursue very much a "business unusual" approach. UNEP's Executive Director, Achim Steiner, has called for a "New Green Deal", citing "the flip side" of the current crisis as the enormous economic, social and environmental benefits likely to arise from combating climate change and re-investing in our 'natural' infrastructure of air, water, soil and the diversity of life. The benefits will accrue from new green jobs in the clean tech sector - clean energy businesses, sustainable agriculture, and conservation-based enterprises.

Creating this desirable future will not be easy, and it will require significant investments of financial and human capital. UNEP's *Global Trends in Sustainable Energy Investment 2008* shows this investment is well and truly underway with more than US$150 billion invested in sustainable energy during 2007, an increase of 60% from 2005.

Although the impact of the financial crises on these trends is uncertain, it will likely increase the challenge to supply lighting, cooking, heating, mechanical power, transport, and other energy services more efficiently and with fewer environmental and human health impacts. There are great opportunities for innovation, but many developing countries have limited institutional capacity to address energy and climate issues. Governments, industries and citizens need support to develop and implement sustainable energy policies and strategies.

In this context, the activities and programmes of UNEP's Energy Branch and the UNEP Risoe Centre on Energy, Climate and Sustainable Development (URC), form a core support to UNEP's overall efforts to mitigate climate change.

Together with a number of partnerships, and with support from the United Nations Foundation (UNF), the Global Environment Facility (GEF), and bilateral donors such as Denmark, Italy, Germany, Netherlands and Sweden, UNEP has built one of the most innovative energy and climate change programmes in the UN system. UNEP activities support local, national, regional and global efforts to provide data, methodologies, and analytical tools. The Energy Branch and Collaborating Centres also directly support relevant government institutions, industries, researchers and non-governmental organisations.

UNEP's aim is to show how things can be done differently. Energy activities within UNEP are designed to create the 'enabling environments' for the transition to a global economy based on increasing energy efficiency and renewable energy – together referred to as 'sustainable energy'. In such an economy, the threat of substantial climate change is substantially reduced. These activities remove market distortions, provide access to energy markets, and accelerate the development and dissemination of technologies and processes to increase the use of sustainable energy and thereby reduce the emission of greenhouse gases.

This publication provides a snapshot of current activities and programmes. We welcome your comments, suggestions and participation to help us fulfil the long-term goal of placing the world's energy systems on a sustainable path.

Mark Radka, UNEP Energy Branch
John Christensen, URC

Integration is the Key

Climate change and other environmental and development issues are strongly interlinked and most activities cut across several boundaries. The key to progress is overcoming multiple barriers– creating the 'enabling environments' for sustainable energy and other technologies.

Often, it is the links between issues and overcoming barriers where progress can be made. The link between good policies and adequate finance, for example, is essential to driving the transfer of technologies to mitigate climate change. UNEP and Risoe work together in an integrated way and with complementary skill sets to create and foster these links.

UNEP's bank partnership programme in Tunisia, PROSOL, is a good example (see below for more programme details). While PROSOL helped 35,000 Tunisian families finance solar water heaters to heat their water without fossil carbon emissions, the Project also worked with the Tunisian government to develop policies that removed market distortions and created incentives for a thriving solar market.

Although the descriptions in this project summary follow more narrow lines, the reader can consider them in the wider context of creating the conditions for the cleanest energy as the basis for sustainable development.

Finance

Addressing climate change and other environmental issues requires substantial capital and investment for technology and infrastructure that reduces or eliminates harmful emissions and other impacts. UNEP's efforts in this area are aimed at changing the attitude of mainstream financiers towards sustainable energy, helping them make investments in the sector, and developing new markets for clean energy.

Sustainable Energy Finance

The starting point for UNEP's finance work is the *Sustainable Energy Finance Initiative* (SEFI, www.sefi.unep.org), a platform to provide financiers with the tools, support and networks needed to drive financial innovation that improves the environmental performance of the world's energy systems. During 2008, SEFI released several new publications including the 2008 edition of *Global Trends in Sustainable Energy Investment* (downloadable from the SEFI website). SEFI also launched the SEF Alliance, a new network of public finance institutions, and is working with the UNFCCC to examine how public finance mechanisms can form part of a future climate agreement.

UNEP is also working with the insurance industry to develop new products that mitigate risks for sustainable energy projects, including a product developed by global insurance companies ParisRe and Marsh to insure against the output of wind farms in Mexico from an insufficient wind resource.

On the ground, UNEP is working with first movers in the finance sector, and helping to develop entrepreneurs and markets for clean energy. *The Rural Energy Enterprise Development Initiative* (REED) has nurtured more than 50 new, clean energy enterprises in developing countries by providing enterprise development services and early stage seed finance. Building on this experience, the *Seed Capital Assistance Facility* (SCAF) will help close the gap between investment returns offered by early stage sustainable energy entrepreneurs and those required by the investment community to create long-term commercial energy investment portfolios.

UNEP's bank partnership programmes offer innovative credit facilities to help households finance the purchase of solar electric and solar water heating systems. Through the *Indian Solar Loan Programme*, UNEP partnered with two of India's largest banks over three years to finance more than 20,000 solar lighting systems through more than 2000 participating bank branches. The Programme helped more than 100,000 people access clean, renewable energy, and prompting 20 other Indian banks to develop similar credit offers.

UNEP is expanding programmes to encourage finance for solar water heating. From the original programme for the Southern Mediterranean countries of Tunisia, Morocco and Egypt, Programmes are underway or planned for Montenegro, Albania,

Macedonia, Mexico, Indonesia, and Chile. UNEP's first effort, *PROSOL Tunisia*, has helped 35,000 families obtain their hot water without the greenhouse emissions of previously used gas water heaters.

Indian Solar Loan Programme Wins UN 21 Award
UN Secretary-General has given the India Solar Home Systems Project a UN21 Award for 2007. The project was one of 15 given the award among more than 70 nominated UN projects. In 2007, the Programme also won the prestigious Energy Globe Award.

Current Activities and Projects

Project	Contact	Description
Sustainable Energy Finance Initiative, SEFI	Eric Usher, eric.usher@unep.fr	A platform engaging the financial community to shift energy investments to a sustainable path.
Seed Capital Assistance Facility, SCAF	Eric Usher, eric.usher@unep.fr	Provides financiers with targeted support to expand portfolios of sustainable energy investments
Sustainable Energy Public Finance Alliance, SEF Alliance	Eric Usher, eric.usher@unep.fr	An alliance of public funding agencies working to promote development of the sustainable energy markets.
MEDREP Finance	Myriem Touhami, myriem.touhami@unep.fr	Support innovative finance measures to develop the market for solar water heating in Tunisia, Morocco and Egypt.
Balkans Renewable Energy Programme, BALREP	Francoise d'Estais, francoise.destais@unep.fr	Support innovative financing to develop the market for solar water heating in Balkan countries
Rural Energy Enterprise Development Initiative, REED	Lawrence Agbemabiese, Lawrence.Agbemabiese@unep.fr	Provides seed capital and enterprise development assistance to African countries of Tanzania, Ghana, Mali, Senegal, Zambia
e-Commerce and Renewable Energy, eCARE	Lawrence Agbemabiese, Lawrence.Agbemabiese@unep.fr	Provides enterprise development services and seed financing to rural business centers powered by renewable energy.
Indonesia Solar Lending Programme	Jan Kappen, jkappen@unep.fr	Supports the development of a credit market for solar technology in Indonesia.

Carbon Finance

Through URC, UNEP plays a crucial role helping developing countries participate in the Clean Development Mechanism (CDM) and other international efforts to address climate change and encourage sustainable development.

The URC's *Energy and Carbon Finance Program* includes an extensive range of research and project activities to help developing countries pursue a low carbon development path. URC provides technical and financial support to develop the capacity of institutions, private companies and individuals to address climate change. The lead project funded by the Dutch Government, *Capacity Development for the CDM,* (CD4CDM , www.cd4cdm.org), has become the brand for one of the largest capacity development programmes in the UN that currently supports 32 developing countries in their efforts to benefit from the CDM. The programme also implements joint activities with UNDP and World Bank and receives bilateral funds directly form Denmark and Germany.

With the forestry sector accounting for almost a quarter of global greenhouse gas emissions, UNEP promotes the CDM in the agricultural and forestry sectors in the Sub-Saharan African countries of Benin, Cameroon, DRC, Gabon, Mali and Senegal. *The Carbon Finance for Agriculture, Silviculture, Conservation and Action against Deforestation* (CASCADe) Project, is funded by the French Global Environment Facility and implemented in partnership with CIRAD - the French Agricultural Research Centre for International Development - and ONFI, the International arm of the French National Forestry Office.

URC's work to increase energy efficiency in the building sector is part of a new research initiative to address difficult project areas in the CDM. Although the building sector accounts for 30% to 40% of global energy consumption and 20% of CO2 emissions, the CDM has until now, not captured the sector's emission reduction potential due to various obstacles. URC has conducted a review of building sector CDM projects under the private-sector partnership program of UNEP's *Sustainable Building and Construction Initiative* (SBCI) to identify barriers to energy efficiency in buildings, and measures to overcoming them.

The Carbon Finance for Sustainable Energy in Africa (CF-SEA) Project has been developing carbon finance and institutional capacity in five countries in Sub-Saharan Africa; Ghana, Zambia, Mali, Cameroon, and Mozambique. Finishing in 2008, the Project helps maximize a country's participation in the CDM by identifying CDM projects for review by the World Bank's carbon fund and possible purchase of emissions reductions, as well as facilitating collaboration between international firms specializing in carbon finance and various economic sectors.

URC also facilitates the participation of developing countries in a dynamic carbon market under constant development. The Energy and Carbon Finance Program continuously analyses barriers, the actions needed to overcome them, and ways to strengthen emerging CDM sectors. The *CDM Pipeline* (www.cdmpipeline.org), for example, allows easy access to information on current and proposed CDM projects, while the *Regional Carbon Forums in Africa* (http://www.ieta.org) and Latin American (www.latincarbon.com) helps buyers and sellers of carbon credits meet in a Forum that is free to country participants, unlike other carbon events.

The *CDM Bazaar* (www.cdmbazaar.net) is a web-based "market place" for CDM buyers, sellers and service providers to meet and investigate joint opportunities, and is hosted by UNEP with the UNFCCC Secretariat

By targeting these niches, UNEP can leverage a small amount of funding for the greatest effect. These and other initiative and projects are helping to create the climate *for* change.

The CDM and Sustainable Development

Community benefits may arise directly from a CDM project itself, such as village electrification, improved air quality or increased employment and income. These may be structured as an "add on" to a project where carbon revenues help to pay for basic social services or infrastructure such as schools or irrigation, for riparian communities.

For example, URC is collaborating with two sisal producers in Tanzania under the CD4CDM project to channel investment into technologies with environmental and local economic benefits for rural areas, including the replacement of chemical fertilizers with quality organic fertilizers for farming activities. In the Tanzanian project, biogas will be captured from 1000 tonnes of daily sisal fibre processing wastes that are currently landfilled, and using this gas to generate electricity for surrounding communities and workers.

The Felou Regional Hydropower Project is another project with substantial carbon reduction and community benefits. The 60 megawatt run-of-river hydroelectric plant being constructed on the Senegal River 200 kilometres downstream of the Manantali Dam will deliver clean, low-cost electricity to consumers in Mali, Mauritania and Senegal while offsetting over 650,000 tons of Greenhouse Gas emissions. This sub-regional CDM project was initially supported through the Carbon Finance for Sustainable Energy Services in Africa (CF-SEA) by UNEP and URC, in cooperation with the World Bank's Community Development Carbon Fund in five countries.

Current Projects and Activities

Project	Contact	Description
Capacity Development for the CDM, CD4CDM	Miriam Hinostroza, Miriam.hinostroza@risoe.dk	Provides technical and financial assistance to develop countries institutional capabilities for the CDM
Carbon Finance for Agriculture, Silviculture, Conservation and Action against Deforestation, CASCADe	Glenn Hodes, glenn.hodes@risoe.dk Jan Kappen jkappen@unep.fr	Promotes carbon credits and the CDM in the agricultural and forestry sectors in the Sub-Saharan African countries of Benin, Cameroon, DRC, Gabon, Mali and Senegal.
Sustainable Building and Construction Initiative (SBCI)	Chia-Chin Cheng, Chia-chin.cheng@risoe.dk	Addresses barriers to energy efficiency in buildings and the construction sector.
CDM Green Facility	Jørgen Fenhann, j.fenhann@risoe.dk	CDM capacity development program in Sub-Saharan Africa and support National Authorities (DNAs).
East/Southern Africa CDM Capacity Building	Todd Ngara, todd.ngara@risoe.dk	UNEP/UNDP project to enhance public and private sector capacity to access carbon finance, and to overcome barriers to carbon markets in sub-Saharan Africa. The project helps create a 'carbon-enabling' framework that can attract commercial carbon finance under the CDM or voluntary carbon markets.
Leveraging Carbon Finance for Sustainable Development in Latin America and the Caribbean	Miriam Hinostroza, miriam.hinostroza@risoe.dk	
Capacity Development for Multilateral Environment Agreements, CD/MEA	Miriam Hinostroza, miriam.hinostroza@risoe.dk	Supports host countries to identify, design, approve, finance, implement and monitor CDM projects under the Kyoto Protocol. The activities will emphasise the development of a national CDM portfolio of projects.
CDM/JI Pipeline Analysis and Database	Jørgen Fenhann, j.fenhann@risoe.dk	Database of all CDM/JI projects sent for validation/registration, as well as baseline & monitoring methodologies, a list of DOEs and analyses of projects.
Carbon Forums	Miriam Hinostroza, Miriam.hinostroza@risoe.dk	The Latin American Carbon Forum brings together active stakeholders to share the latest knowledge on regional and global carbon markets, information about climate change policy trends, and opportunities for networking and business opportunities.
	Glenn Hodes, glenn.hodes@risoe.dk	A high-profile event combining a carbon investment trade fair, a policy forum for African Designated National Authorities and climate change officials, as well as targeted capacity building for participation in the CDM.
UNFCCC CDM Bazaar	Lars Rosendahl Applequist, lars.rosendahl@risoe.dk Kasper Agger, kasper.agger@risoe.dk	The UNFCCC CDM Bazaar is a Web-based facility for the exchange of information on CDM projects and opportunities.

Policy

One of UNEP's key strengths is the ability to convene networks and partnerships that share, develop and test new ideas for policies and technology. UNEP facilitates the *Global Network on Energy for Sustainable Development* (GNESD, www.gnesd.org), a collaboration between more than 20 centres of excellence in both developing and industrialized countries noted for their work on energy, development, and environmental issues. The Network and a small Secretariat is co-located with the URC in Denmark.

Since 2003, GNESD has produced targeted research and workshops on critical themes with organisations such as the United Nations Development Programme (UNDP) and the International Energy Agency (IEA). Previous themes include energy access and renewable energy technologies. GNESD is currently involved in two thematic areas: energy access for the urban poor, and energy security for the poor. In 2009, GNESD will initiate a new thematic study on Bioenergy.

The Renewable Energy Policy Network for the 21st Century (REN21, www.ren21.net)
is a global policy network for international leadership on renewable energy. The REN21 goal is to help the rapid expansion of renewable energy in developing and industrial countries by bolstering policy development and decision-making at the local, national and international levels. REN21 has released a series of reports on the renewable energy industry, including an updated Global Status Report for 2008.
UNEP Energy co-hosts the REN21 Secretariat with the German technical cooperation enterprise, GTZ.

Solar and Wind Energy Resource Assessment (SWERA, http://swera.unep.net)
SWERA is an international collaboration of more than 25 institutions to map the solar and wind energy resources of 13 developing countries in South America, Central America, Africa and Asia. After a successful initial phase, SWERA is expanding its mapping and analysis services, including new work in South Africa, China and Brazil. These resources can help governments develop appropriate policies to foster clean energy markets in their county or region.

UNEP also works with the *Network of National Climate Change Focal Points in Southeast Asia* to support action on climate change; helping to improve the development and exchange of knowledge among climate change focal points and climate change professionals in countries in Southeast Asia.

Current Activities and Projects

Project	Contact	Description
Global Network on Energy for Sustainable Development, GNESD	Moinul Sharif, moinul.sharif@risoe.dk	A network of more than 20 centres of excellence in both developing and industrialized countries noted for their work on energy, development, and environmental issues.
Renewable Energy Network for the 21st Century, REN21	Philippe Lempp, philippe.lempp@ren21.net	A global policy network for international leadership on renewable energy
Solar and Wind Energy Resource Assessment (SWERA)	Tom Hamlin, Tom.hamlin@unep.fr	An international network of more than 25 institutions to map solar and wind energy resources
Network of National Climate Change Focal Points in Southeast Asia	Mark Radka, mark.radka@unep.fr	Supports the development and exchange of knowledge among climate change focal points and climate change professionals in countries of Southeast Asia.

Sustainable Energy Development

A core theme of UNEP activities is helping developing countries access modern sources of energy, such as electricity in ways that contribute to sustainable development. In many developing countries today, however, climate change remains a marginal issue to the pressing issues of food security, poverty, natural resource management, energy access, and urban transport.

Finding policies and actions that can drive development and at the same time address the challenge of climate change is the core of these URC and UNEP activities. These projects apply new approaches to the planning and implementation of actions to improve energy access for rural and peri-urban communities, particularly in Africa. The intersection of sustainable development and climate change is also a key focus of URC's ongoing work within the Intergovernmental Panel on Climate Change (IPCC).

At this intersection of energy access, development and climate change, URC and UNEP develop and apply expertise consolidated through many years of research and projects to increase access to sustainable energy for development purposes in a large number of developing countries in Africa, Asia and Latin America.

Increasing access to modern energy services also underpins efforts to achieve the Millennium Development Goals (MDGs), but such efforts can also mitigate climate change. Supply of and access to clean energy can be related to climate change. Providing better health care, water supply, infrastructure, education, and income can contribute to increasing the resilience or robustness of populations to the negative effects of climate change.

A central activity in URC is the development and use of methodologies to link energy and the MDGs through impact and outcome analysis. The EU/COOPENER project DEA (www.deafrica.net) was a central part of this effort, working with centres in six African countries to document the impacts of a range of energy interventions. Similarly, the APPLES project looked at channels to provide clean energy access in South Africa. One of URC's roles included a monitoring and evaluation (M&E) component. Work continues on M&E issues, building on the experience gained through these COOPENER projects, in collaboration with a number of African centres and the Global Village Energy Partnership.

Another project, *Poverty Alleviation through Cleaner Energy in Agro-industries in Africa* (PACEAA) is helping to develop the tools, policies and business infrastructure to provide clean electricity for rural communities in East Africa. With support from the European Commission's COOPENER programme, PACEAA is being coordinated with two larger initiatives funded by the Global Environment Facility (GEF), and co-implemented by the United Nations Environment Programme (UNEP) and the African Development Bank. The first project supports the development of small hydropower for the tea factories as a substitute for expensive and unreliable electricity from the grid and diesel backup power.

UNEP and URC activities also stretch to more remote areas of the globe. The *Nordic Network on Sustainable Energy Systems for Isolated Locations* (NordSESIL, www.nordsesil.net), has been established to improve the capability of communities in isolated areas of the Nordic region to access sustainable energy solutions.

Climate Change Adaptation

In March, URC began a project to help sub-Saharan African countries adapt to the consequences of a world with higher concentrations of greenhouse gases. With major funding from the *Danish International Development Agency* (Danida), the *Climate Change and Development: Adapting by Reducing Vulnerability Project* (CC DARE, www.ccdare.org) provides flexible and targeted financial and technical support to countries for activities that reduce the vulnerability to climate change and progress the integration of climate change impacts into their development planning and decision-making frameworks.

As a joint effort of UNEP and UNDP, CC DARE is designed to complement and strengthen relevant ongoing and planned conventional project and programme-based activities. Importantly, the countries themselves drive the activities.

Bio energy

Bio energy is a focus area with many links to other UNEP projects and issues. UNEP's Bioenergy Programme includes activities to develop a standard for sustainably producing biofuels. This work also supports governments in their bioenergy planning and policy frameworks while promoting small businesses planting energy crops to capture the development benefits of biofuels.

UNEP is participating in the *BioTop Project* to identify the technical opportunities and research needs for Latin America to synchronise their biofuels sector with Europe. BioTop develops scenarios and recommendations for sustainability, standardization, and trade aspects of future large-scale biofuel production.

Sustainable Transport

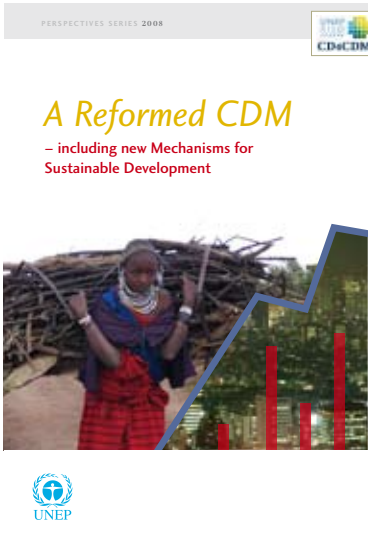
The transport sector supports a large part of all economic activity, but it comes with substantial negative impacts. The UNEP Sustainable Transport Programme integrates an environmental factor into transport-related decisions from the global to personal levels. The overall objective is to create a progressive shift in transport systems and mobility options that are less polluting.

To help Latin American countries create sustainable transport networks, URC created the *Network for Environmentally Sustainable Transport in Latin America and the Caribbean*, or NESTLAC. With support from GEF, NESTLAC promotes the benefits of sustainable transport to politicians, decision makers and other stakeholders in Latin America.

Current Activities and Projects

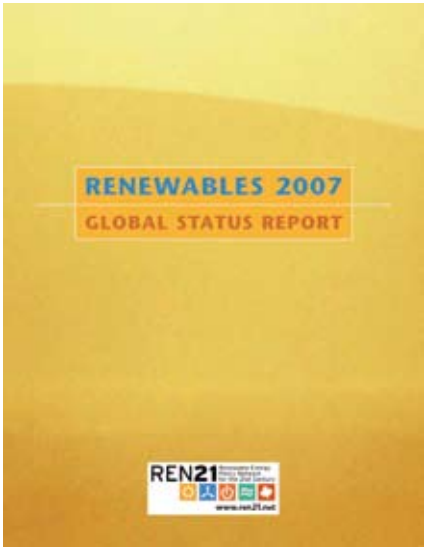
Project	Contact	Description
Poverty Alleviation through Cleaner Energy in Agro-industries in Africa, PACEAA	Gordon Mackenzie, Gordon.mackenzie@risoe.dk	Develops the tools, policies and business infrastructure to provide clean electricity for rural communities in East Africa
Climate Change and Development: Adapting by Reducing Vulnerability Project, CC DARE	Anne Olhoff, anne.olhoff@risoe.dk	Supports nationally driven, short term, and targeted activities to reduce vulnerability to climate change in sub-Saharan Africa
Sustainability Standard for Biofuels	Martina Otto, Martina.otto@unep.fr	Develops a sustainability standard for biofuel production through the Roundtable on Sustainable Biofuels and the Global Bioenergy Partnership
Bioenergy planning and policy frameworks	Martina Otto, martina.otto@unep.fr	Supports governments in bioenergy planning and policy frameworks; providing policy-relevant scientific reviews, tools for bioenergy mapping and impact assessments, and reviews of policy measures
Bioenergy Enterprise Development	Martina Otto, martina.otto@unep.fr	Promotes small agribusinesses producing energy crops through a network of centres of excellence that develop, validate and disseminate information on appropriate crops, processes, and business models
BioTop	Jorge Rogat, jorge.rogat@risoe.dk	Identifies technical opportunities and research needs for Latin America to synchronise their biofuels sector with Europe
Network for Environmentally Sustainable Transport in Latin America and the Caribbean, NESTLAC	Jorge Rogat, jorge.rogat@risoe.dk	Promotes the benefits of sustainable transport to politicians, decision makers and other stakeholders in Latin America
Nordic Network on Sustainable Energy Systems, NordSESIL	David Pointing, david.pointing@risoe.dk	Network to improve the capability of communities in isolated areas of the Nordic region to access sustainable energy solutions.

Publications



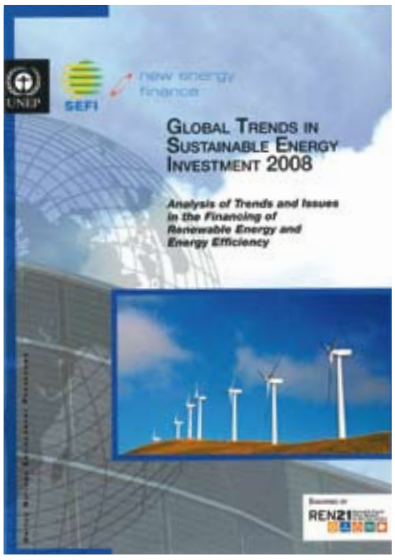
Perspectives

This second edition of Perspectives includes diverse insights from 17 leading actors in the rapidly developing carbon market on reforming and reinforcing the CDM in a post-2012 climate regime. Perspectives is designed to better inform professionals and policy makers in the lead-up to the Copenhagen COP and beyond.



Global Trends in Sustainable Energy Investment, 2008

The latest edition of Global Trends shows global investment topped $150 billion in 2007. The report includes a range of information, graphics, and analysis on the sustainable energy investment sector.



REN21 Global Status Report, 2007

The annual Global Status Report is a comprehensive analysis of renewable energy projects and capacity around the globe.

This folder provides information on the activities in UNEP and at the UNEP Risø Centre. Views published here do not represent the policies or views of the partner organisations or Governments.
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