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OUR PLANET

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MAINTAINING MOMENTUM

Financing Action On Climate

OUR PLANET

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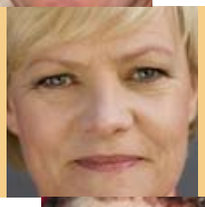
also

His Serene Highness Prince Albert II of Monaco...

...argues that the public and private sectors both have a key role to play in sustainable development.

Kristin Halvorsen, Norway's Minister of Finance...



...describes the importance of green taxes and international engagement in addressing climate change.

Roberto Dobles, Minister of Environment and Energy, Costa Rica...

...describes a breakthrough in financing the conservation of the forests on which the future of the planet depends.

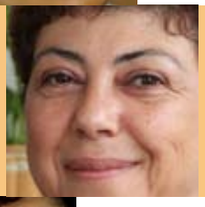
Martin Parry, Co-Chair of IPCC Working Group II...

...spells out the reasons why the world should invest immediately in adaptation to climate change.

Marina Silva, Minister of the Environment, Brazil...

...describes how developing countries are ready to play an appropriate part in tackling climate change.

Monique Barbut, CEO and Chairperson of the Global Environment Facility...

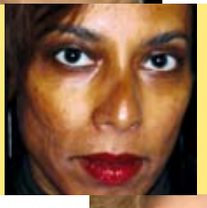


...describes the imperative of effectively financing adaptation to climate change.

Nicky Gavron, Deputy Mayor of London...

...describes how cities are taking the lead worldwide in practical action on the ground.

Anilla Cherian, an independent consultant who has worked for a range of UN, intergovernmental agencies and NGOs...



...describes how integrating climate change adaptation with sustainable development objectives matters for vulnerable countries and communities.

Christiana Figueres, a recent member of the Executive Board of the Clean Development Mechanism...

....gives a personal view of how it will have to evolve to meet the scale of the challenge of climate change.

Legendary Bollywood actor **Amitabh Bachchan**...

... describes how he has taken up the cause of climate change and is working to persuade hundreds of millions of fans to do the same.

reflections

by Achim Steiner, UN Under-Secretary-General and Executive Director, UNEP

If the world is successfully to navigate the Road Map agreed at the Bali climate change negotiations in December, ways need to be found to mobilize and focus the trillions of dollars in the world's financial and capital markets on the greening of the global economy.

Such greening has already begun, driven by the Kyoto Protocol, anticipation of even deeper cuts from a new climate regime after 2012 — and by the growing realization that if 21st century economies are to compete, flourish and deliver a new generation of jobs, they will need to be more resource efficient and less dependent on finite natural resources. Now the challenge is to accelerate and mainstream these real, tangible but fledgling beginnings.

Financing a transition to a low carbon society is one of the central issues, along with climate proofing economies, before delegates at the 10th Special Session of UNEP's Governing Council in Monaco. The attending environment ministers, and their institutions, have been in the forefront of championing forward-looking economic and policy instruments, through partnerships with pioneers in the financial services sector, industry, other UN organizations, organized labour, scientists, civil society and law makers.

In preparation for the Special Session and the accompanying Global Ministerial Environment Forum, I asked for a snapshot of the growing green economy, including UNEP's collaborative work. It gives a glimpse into where we are, and perhaps where we need to go — and opens a window on such wider sustainability challenges as the Millennium Development Goals and what Secretary-General Ban Ki-moon calls the "bottom billion" of our global society.

For example:

- 275 financial institutions, managing assets worth $13 trillion, participate in the Principles for Responsible Investment — inspired and facilitated by UNEP and the UN Global Compact.
- Sustainable energy financial transactions reached over $100 billion in 2006, according to UNEP's Sustainable Energy Finance Initiative and the New Economics Foundation.
- Some 60 countries, including 13 developing ones, have targets for renewables. Around 80 have market mechanisms, feed-in tariffs and renewable portfolio standards.
- More than 2.3 million people now have jobs in the renewable energy sector versus around 2 million in oil and gas.
- 100,000 people in rural India now have solar power after UNEP, and local banks, introduced an affordable loan scheme. It is now self-financing.
- Emissions trading, developed mostly as a result of the European Union's Trading Scheme — saw 362 million tonnes of $C0_2$, worth around seven billion Euros, traded in 2005.
- Kyoto's Clean Development Mechanism mobilized investment worth close to $6 billion, in 2006, roughly equal to the funds from Official Development Assistance in the same areas.

Financing for adaptation presents a different challenge — one of making more intelligent use of conventional development assistance, as well as markets. The amounts required need more precision. But the UN Framework Convention on Climate Change says that, by 2030, additional investment could include: $14 billion for agriculture, forestry and fisheries; $11 billion for new water supply infrastructure; and between $8 and $130 billion for infrastructure.

Energy saving holds particular potential. If the annual rate of energy efficiency improvement could be increased from the current one per cent to 2.5 per cent world-wide it might be possible to keep atmospheric carbon dioxide concentrations below critical levels for this century. How can this be done and how much will it cost? Indeed, would it actually cost anything given the dramatic potential savings in fuel bills and resource use — and from averting the economic impacts of climate change?

The momentum on climate change in 2007, driven by the science, was nothing short of breathtaking. Policy makers must now drive the solutions. Many will ultimately be found in the Stock Exchanges and banking centres, and in the boardrooms of the world's corporations, if only governments seize the moment, define the objectives and devise the rules of the low carbon economy.

Cover photo © HARALD SUND/ Gallo Images/ Getty Images. The sun is rising on a new era in the fight against climate change. Governments, corporations and organizations have woken up to the tremendous potential of economic tools to finance the transition to a low-carbon society. UNEP is playing a leading role, both in defining the issues and delivering the solutions.

people

U2 frontman **BONO** has long been known for his vocal activism against poverty. But the World Economic Forum in Davos saw him take on a

new angle – climate change. Bono appeared on stage alongside former US vice president and climate campaigner Al Gore to call for solutions that combine the fights against global warming and poverty. "The brunt of this climate crisis is going to be felt in the developing world. All your work... will be undone if you don't focus on this," Bono told the political and business leaders gathered at the meeting.

AMY FRAENKEL, the new director of UNEP's Regional Office for North America, has more than 20 years of experience in environmental and maritime law and policy. She has worked

in both the executive and legislative branches of the United States government, inter-governmental organizations, and the private sector. Ms Fraenkel joins UNEP from the U.S. Senate Committee on Commerce, Science and Transportation where she served as Senior Counsel of the Oceans, Atmosphere, Fisheries and Coast Guard Subcommittee. Before joining the U.S. Senate, Ms. Fraenkel worked as a senior policy advisor in the Office of International Affairs within the U.S. Environmental Protection Agency in Washington, D.C. There she served as coordinator for UNEP, and negotiated agreements in UNEP, the International Maritime Organization, the World Trade Organization and the Organization for Economic Cooperation and Development. She has also served as a consultant to the United Nations and to the OECD.

Wind power entrepreneur **TULSI TANTI** is one of two Indians who made it onto Time magazine's Heroes of the Environment list

(the other one is glaciologist DP Dobhal). Mr. Tanti's first business, a textile factory, suffered from prohibitive energy costs until he bought two wind turbines. He then decided to start up a factory making them. By 2005 Mr. Tanti was on the Forbes list of India's richest people. His company, Suzlon, is now the fourth-largest wind turbine maker in the world, with wind farms across Asia and factories on four continents. "Yes, green business is good business," he says. "But it's not just about making money. It's about being responsible."

UN Secretary-General Ban Ki-Moon has named **ANGELA CROPPER**, from Trinidad and Tobago, as the new UNEP Deputy Executive Director and Assistant Secretary-General. Ms Cropper, who takes up her post in February, succeeds Shafqat Kakakhel after his nine years of distinguished service in the post. A longtime environmental campaigner and a

former member of the Parliament of Trinidad and Tobago, Ms Cropper brings to UNEP strong experience in environmental policy, analysis and negotiations. Her list of achievements and successes include senior positions held in a wide range of national and international institutions — including the Caribbean Community and Common Market Secretariat (CARICOM) and the World Conservation Union (IUCN) — as well as contributions to numerous key and relevant boards, trusts, committees and global assessments. Among her previous high-level positions, Ms Cropper has worked as interim Executive Secretary of the UN Convention on Biological Diversity and as Senior Adviser on Environment and Development with the United Nations Development Programme.

Abu Dhabi's Crown Prince Sheikh **MOHAMMAD BIN ZAYED AL NAHYAN** is taking his oil-rich country to the forefront of renewable energy investment. At the World Energy Summit in Abu Dhabi in January, he announced an investment of 15 billion US dollars of new money into alternative energy projects including wind, solar and carbon capture technologies. The

money will be channelled through the new Masdar Initiative, which expects to raise more than 200 billion US dollars for renewables in the next decade. The most notable project tabled by Masdar is a plan to build "the world's first zero-carbon, zero-waste, car-free city" — the car-free city will be designed to run entirely on renewable energy and should be completed by 2015. The Crown Prince also announced the establishment of the Zayed Future Energy Prize, which will award a total of 2.2 million US dollars annually to "three individuals or organizations that have made significant contributions in the global response to the future of energy".

The United Kingdom has named former Merrill Lynch executive **ADAIR TURNER** to head its new Committee on Climate Change, which will advise the government on targets to

reduce carbon-dioxide emissions. The high-powered committee will outline the amount of greenhouse gas the U.K. should emit over successive five-year periods in order to achieve its goal of slashing emissions 60 percent from 1990 levels by 2050. Welcoming his nomination, Britain's Environment Secretary Hilary Benn said "the Committee on Climate Change will play a central role in our push towards achieving a low-carbon economy in Britain". Mr. Turner, a lawmaker at the House of Lords, has led two commissions for government on low pay and pensions and is a trustee of the World-Wide Fund for Nature. Previous senior positions include vice chairman of Merrill Lynch's European division and director-general of the Confederation of British Industry.

work together

Message of His Serene Highness Prince Albert II of Monaco

On the occasion of the tenth special session of the Governing Council of the United Nations Environment Programme, the Global Ministerial Environment Forum will be held in Monaco for the first time, from 20 February to 22 February 2008.

This is a recognition of the actions carried out by the Principality in the field of the environment. Environmental policy is central to all our concerns. It is present in every aspect of the economic, social and cultural life of the Principality.

One of the main themes of this meeting will be "Globalization and the environment — mobilizing finance to meet the climate change challenge". It is only by mobilizing everyone, public and private partners alike, at the local and international level, that we can bring about solutions to safeguard the future of our planet.

To meet this challenge, we have to work together to frame our responses to the problems posed. Unilateral declarations will not settle the issue. It is the whole planet that is under threat.

One of the main objectives of this debate, in my opinion, will be to show that public finances and the private financial sector have a joint role to play in promoting sustainable development.

The costs of restoring emissions to their current level in 2030 have been estimated by the United Nations Framework Convention on Climate Change at more than 200 billion dollars a year.

State budgets should be greatly increased. A significant part of the investment envisaged for the energy generation sector should be devoted to renewable energy sources. Additional investments will be needed for the research and development of new technologies.

The consequent budget investment will be futile, however, unless private investment sources are strengthened.

There is no longer any room for conflict between the ideas of the environment and economic development. Today the stakes are high, and every branch of the economy has to contribute to achieving this fresh goal, combining technological innovation and respect for the environment. It will be a source of certain growth.

This tenth special session of the Governing Council of the United Nations Environment Programme will be a unique occasion for setting a concerted course of action and instituting an environmental code of ethics.

Climate change is now. The question is no longer whether human behavior is contributing to it, but how vast and irreversible the damages will be. Yet public awareness — and political focus on climate change issues and the need for mitigation — makes me believe there is still hope.

Climate change is by far the biggest environmental challenge facing the world, but meeting it is still possible. From the perspective of a Minister of Finance Norwegian policy is twofold. We have a long and successful experience with green taxation which alters national consumption in a more environmentally friendly way and gives incentives for technological innovation. However, climate change also requires an international strong, coherent, and sustainable response. We need an international emissions scheme with strong caps. We addressed this to some extent at the Bali climate talks in December. I will continue stressing these issues.

Taxes have been introduced in Norway to reduce environmentally harmful emissions to air and water, and to cut the amount of waste generated. The first tax with an explicit environmental purpose was levied on sulphur in mineral oil in 1971, and ours was one of the first countries to introduce a CO_2 tax. Today we have environmental taxes on emissions of climate gases, sulphur, NOx, the final treatment of waste, chemicals that damage the environment and health, and on beverage packaging — and several other taxes are differentiated according to environmental standards. This has contributed both to emission reductions and to the development of new technology.

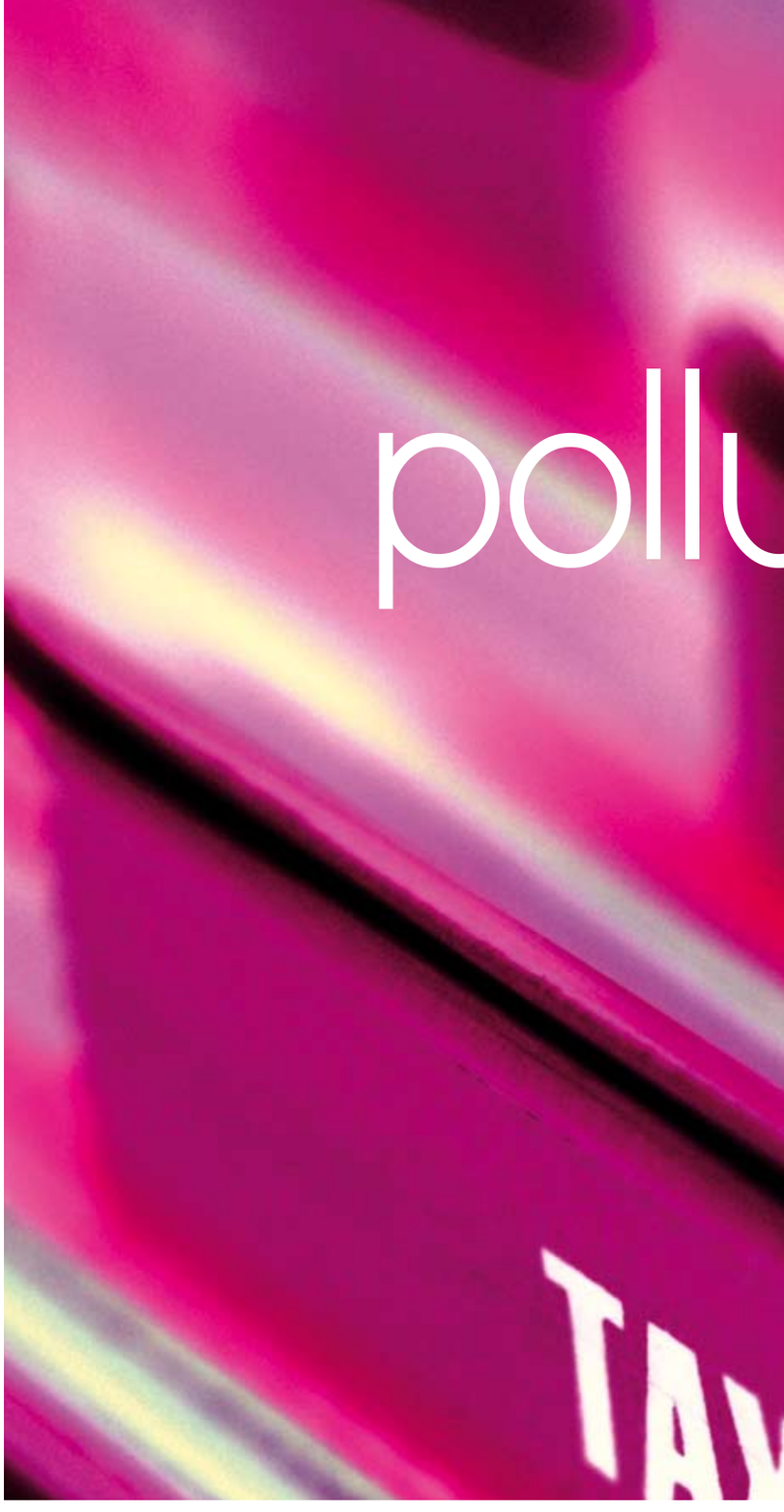
The present Government has introduced several new green taxes. We will continue this tax adjustment and offset the revenues from increases in environmental taxes by corresponding reductions in other direct and indirect ones. In Norway 5.5 per cent of central governmental tax revenue now comes from environmental and energy taxes — equivalent to 1.5 per cent of GDP in 2007 — among the highest in OECD countries. Through this means, we can maintain a high level of welfare, without increasing other taxes. Their main purpose is, and will always be, to reduce environmentally harmful consumption and production. However, it is no disadvantage that they raise income, as well as improving the environment.

As Minister of Finance I also coordinate the Government's work on sustainable development. Caring for our common resources through environmental policies is not a contradiction of sustained economic and social development but a precondition for it. Mitigation, including its costs and consequences for the economy, needs to colour all political decisions.

Norway strongly advocates the polluter pays principle. Through economic policy instruments like green taxes and emissions permits, we make pollution costly and emissions reductions economically desirable. More than 75 per cent of our national climate emissions are regulated either by taxes or permits. A tax works like a price on emissions and gives the polluter an incentive to reduce emissions as long as the reduction costs are lower. The reductions are thus made as inexpensively as possible, and incentives are created to achieve them where the cost to the economy is the lowest, allowing us to get the most out of the resources spent. Cost-effective policies thus give countries room to undertake more ambitious international commitments.

A permit-trading system works in a similar way, but here the price is determined in a market. Emitters who can reduce emissions at relatively low costs, do so and sell permits as long as the market price exceeds these costs. Conversely, emitters who have large mitigation costs will buy permits as long as the market price is below the price of reductions. About 40 per cent of Norway's emissions of greenhouse gases will be covered by this system.

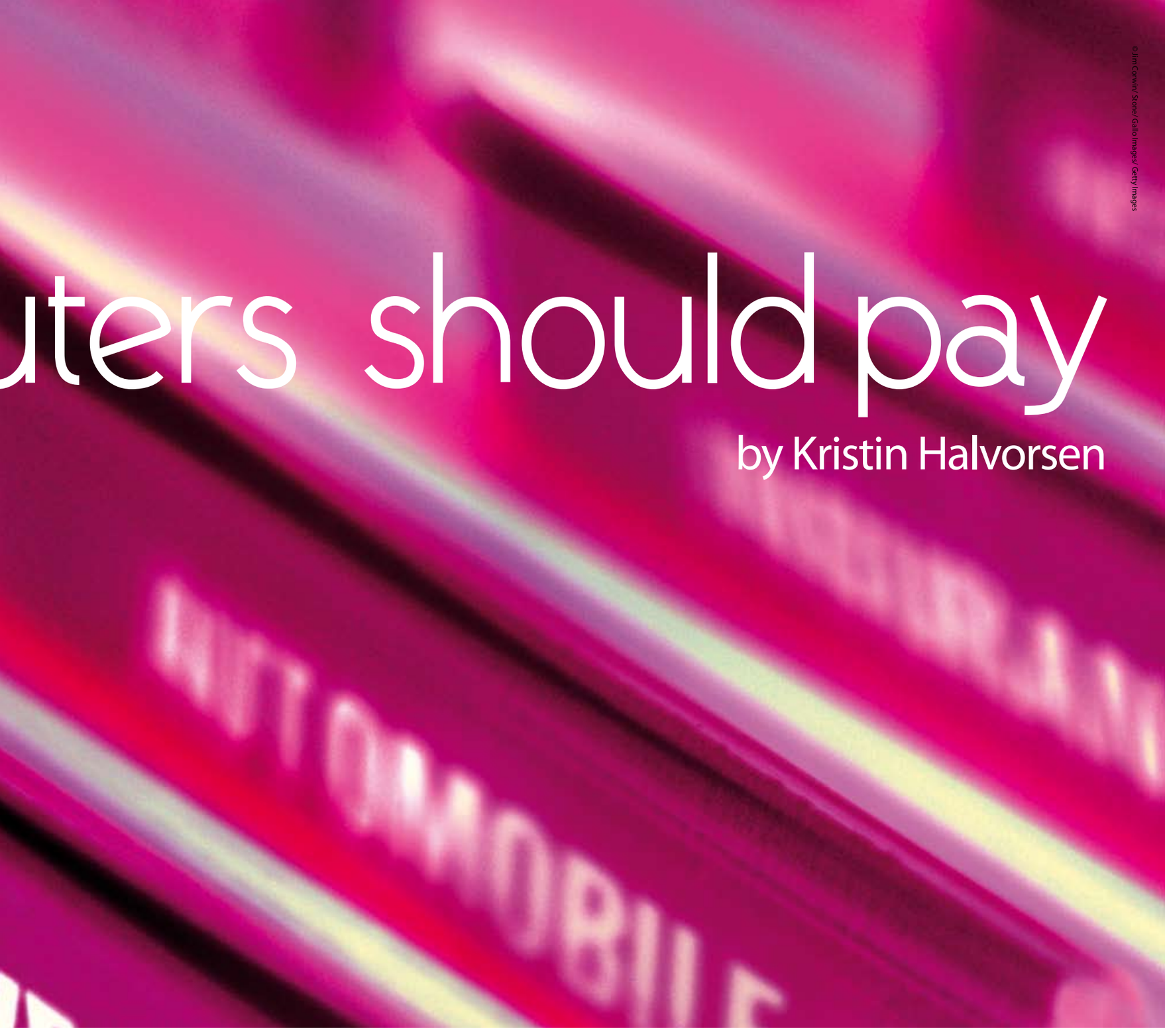
An efficient system requires allowances to be allocated to create incentives for emission reductions. This takes place when the total amount of permits is sufficiently below the current level of emissions. In Norway permits are allocated to represent a level 20 per cent below the total emissions from for



entities regulated under the system. Only 30 per cent of the allowances will be allocated free of charge. This will contribute both to higher prices and to real emission reductions.

Carbon markets are key tools for reducing global greenhouse gas emissions cost-effectively and so I am pleased that the number of permit trading systems and their coverage is increasing.

We believe that the EU Emissions Trading System could be a very good starting point for a global system, and are eager to participate in the effort to expand it to cover more countries and more sectors. The essence of an international system with tradable permits is to give all countries the same incentive to



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uters should pay

by Kristin Halvorsen

reduce emissions. Each country should then pass on the abatement costs to domestic emitters. Through this, both producers and consumers of their products will be encouraged to contribute to reduced emissions. A global market price on greenhouse gas emissions will induce countries, businesses and individuals to invest in low-carbon assets and push the world towards a more sustainable path.

A global system of equitably distributed national quotas will generate a demand for permits from developed countries, and in this way become a means of transferring resources from richer countries to emerging economies and developing countries. Developing economies have a right to develop, and they should be given strong incentives and high rewards for growing in a climate-friendly manner. Such a regime will generate more mitigation per dollar as well as substantial resource transfers to developing countries to be used for adaptation, reforestation, and investments in sustainable technology.

A well functioning international permit trading system will provide the world-wide private sector with strong and much-needed incentives for cutting emissions. The business world knows that a tighter cap on greenhouse gas emissions will lead to increased permit prices. Expectations of higher costs linked to emissions will thus immediately influence business decisions. For this to have the maximum impact, it is imperative that as soon as possible everyone perceives an effective global agreement as the credible long term solution. UNEP

verbatim

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"It just shows that we are off the hype curve and into solutions."

Environmental entrepreneur Shai Agassi commenting on the lack of an official 'green' agenda at this year's Davos World Economic Forum

"I think we have come a long way here. In this, the United States is very committed to this effort and just wants to really ensure we all act together. We will go forward and join consensus."

Paula Dobriansky, head of the US delegation at the Bali climate change conference

"In a process led by the United Nations, we must create a successor to the Kyoto agreement which ends in 2012. Some additional initiatives from other countries could be useful. But it is important that they flow from the United Nations. For me, that is non-negotiable."

German Chancellor Angela Merkel

"Existing energy technologies alone will not meet the growing global demand for energy, while also reducing emissions to necessary levels. Ultimately, we must develop and bring to market new energy technologies that transcend the current system of fossil fuels, carbon emissions, and economic activity. Put simply, the world needs a technological revolution."

US Secretary of State Condoleezza Rice

"The consequences of global climate change are so pressing that it doesn't matter who was responsible for the past; what matters is who is responsible for the future – and that means all of us. The rich nations and the poor nations have different responsibilities. But one responsibility we all have, and that is action…action, action, action! It is time to come together in a new international agreement that can embrace rich and poor nations alike."

Arnold Schwarzenegger, Governor of California

"Climate change policies cannot be the frosting on the cake of development; they must be baked into the recipe of growth and social development."

Robert Zoellick, President of the World Bank

"If the world is moving towards a low carbon future then those companies that are going to be ahead of the others at arriving at low-carbon solutions will really benefit most."

Rajendra Pachauri, chairman of the International Panel on Climate Change

"For Australians, climate change is no longer a distant threat. Our rivers are dying, bushfires are more ferocious and more frequent and our natural wonders – the Great Barrier Reef, Kakadu, our rainforests, are now at risk."

Australian Prime Minister Kevin Rudd

numbers

40
percentage of the world's population which could be affected by the melting of snow and glaciers in Asia — *UN report*

60
percentage of ecosystem services assessed that are degraded or used unsustainably — *GEO4 report*

70
percentage of available water taken up by irrigation. GEO-4 says meeting the Millennium Development Goal on hunger will mean doubling food production by 2050 — *GEO4 report*

100 billion
worldwide investment in renewable energy in US$. This makes up 18 percent of new investments in the power sector — *report by UNEP's SEFI*

40
percentage increase in air miles flown between 1990 and 2003 — *GEO4 report*

20
percentage cut in CO_2 emissions proposed by the European Commission in its new climate change package — *European Commission*

50,000
number of years during which some greenhouse gases may persist in the atmosphere — *GEO4 report*

34
percentage by which deforestation in the Amazon increased in 2007 compared to 2006 — *Brazilian government*

30 billion
value of the carbon market in US$ in 2006, three times greater than 2005. This was dominated by EU allowances worth nearly US$25bn — *World Bank*

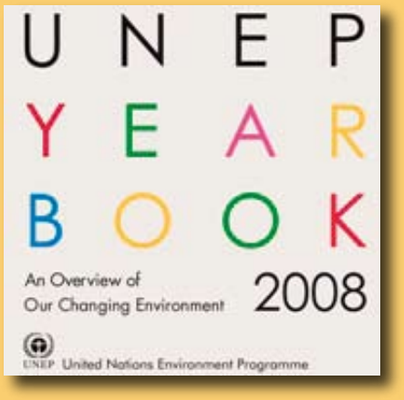
2 billion
amount in US$ pledged by George W. Bush for next three years for the US's new clean technology fund. — *State of the Union address*

1 million
number of jobs which would be created in Europe by a 20 percent increase in energy efficiency — *UNEP 'Green Jobs' report*

40
percentage of global energy used in the building sector, which is also responsible for one third of GHG emissions — *UNEP report*

books

The UNEP Yearbook 2008 — An Overview of Our Changing Environment



The UNEP Yearbook 2008 (formerly the GEO Year Book) is the fifth annual report on the changing environment produced by UNEP in collaboration with many world environmental experts. It brings the spotlight on new developments and scientific findings and highlights the complex interconnections between climate change, ecosystem integrity, human well-being and economic development. The Global Overview surveys the significant environmental events of 2007. The Feature Focus documents some of the creative efforts already working in markets and financial circles to fight the growing climate crisis. The section on Emerging Challenges, finally, examines new and recent scientific findings on the role arctic climate feedbacks in climate change.

UNEP Annual Report

This summary of UNEP's activities in 2007 provides an overview of the organization's contribution to the fight against climate change in a year in which unequivocal evidence established that global warming is the defining challenge of our era. The report also looks at the broad range of other activities carried out by UNEP as it follows its mandate to provide environmental leadership and promote sustainable development.

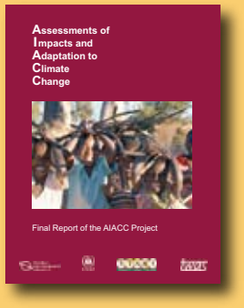
Climate Action

Launched in Bali at the United Nations Climate Change Conference, Climate Action — produced by UNEP in partnership with Sustainable Development International — advises governments and businesses on how to lower greenhouse gas emissions. It features a wide range of articles that encourage the sharing of best practice and the development of new technologies and initiatives to reduce CO_2, highlighting the opportunities for business and governments. With authors including Ban Ki-moon, Dr Rajendra Pachauri, Sir Nicholas Stern, and Eileen Claussen, the book promotes dialogue between government and international industry, and highlights the sharing of best practice while raising awareness of the latest market trends, threats and opportunities in response to rising global temperatures.

Climate Change 2007 — Synthesis Report

This latest report by the Intergovernmental Panel on Climate Change (IPCC) distills the challenges and opportunities facing the world as a result of climate change. The book — the final part of the IPCC's Fourth Assessment Report — includes a Summary for Policymakers which underlines the urgency of acting to reduce greenhouse gas emissions, as well as the economic costs and the benefits of a transition to a low carbon society. It includes a detailed review of climate change observations and modelling for every continent, as well climate model simulations. Written by over 600 leading experts from around the world, this is the standard scientific reference for everyone concerned with climate change and its consequences.

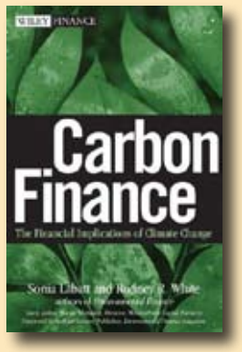
Climate change and adaptation



Much of the developing world is highly vulnerable to climate change, but these regions have not yet been studied enough and gaps in knowledge are impeding effective adaptation. 'Climate change and adaptation' aims to help fill these gaps by presenting the results of case studies in Africa, Asia and Latin America that explore the nature and causes of climate change vulnerability, current practices for managing climate risks, and strategies for adapting to climate change. The book is produced by UNEP's Assessment of Impacts and Adaptation to Climate Change (AIACC) project. The case studies were co-sponsored by the IPCC and made a major contribution to the panel's 4th Assessment Report.

www.unep.org/publications

Carbon Finance: The Financial Implications of Climate Change

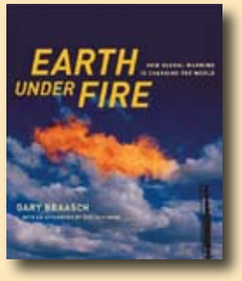


Sonia Labatt and Rodney R. White
(Wiley, April 2007)
In this book, Sonia Labatt and Rodney White assess the carbon market which is currently developing, with an analysis of the financial opportunities and challenges presented by climate change. The authors illustrate how challenges and opportunities will arise within the carbon market for banking, insurance, and investment activities as well as for the regulated and energy sectors. They also provide an in-depth description of adaptive measures and insurance products for managing risk in a carbon constrained economy.

World in Transition — Climate Change as a Security Risk

(Earthscan, 2008)
This report by the German Advisory Council on Global Change argues that in the coming decades, climate change is likely to increase tensions and conflicts over natural resources in our climatically constrained world. The book spotlights places where possible conflict may flare up in the 21st century — jeopardizing national and international security to a new degree — unless climate change is kept in check. But the authors also argue that climate change could unite the international community, provided that it recognizes climate change as a threat to humankind and soon sets the course for the avoidance of dangerous anthropogenic climate change by adopting a dynamic and globally coordinated climate policy. The book makes it clear that climate policy is preventative security policy.

Earth under fire: How Global Warming Is Changing the World



Gary Braasch
(University of California Press, 2007)
'Earth under Fire' is a comprehensive look at the worldwide effects of climate change. In dramatic photographs, maps and quotes from world climate science leaders, the book shows how the Earth is being changed right now. With 110 photographs as well as maps and scientific essays, it illustrates the ongoing shifts our planet is going through, from weather extremes and melting glaciers to disruptions of animal migration and plant growth — including the strong impact on human life, cities and cultures.

forests —

Tropical forests are one of the planet's most precious ecosystems, home to a huge variety of species, storehouses of genetic resource diversity. They provide crucial environmental services — from conserving soil and watersheds to protecting against floods, landslides and other natural disasters — and are important sources of tourist income. Internationally, forests have a crucial role in maintaining the climate balance as reservoirs and sinks of carbon: standing forests are the most important carbon dioxide reservoir on earth. Yet deforestation is escalating, and now accounts for 13 million hectares a year, equivalent to 1.5 per cent of the 858 thousand million hectares of the world's tropical forests.

Even though an estimated 20 per cent of the world's emissions of greenhouse gases are associated with deforestation — and two thirds of this is attributed to the loss of tropical forest — the issue has, until recently, been conveniently swept under the carpet.

Two years ago in Montreal, the 11th Conference of the Parties (COP13) the UN Framework Convention on Climate Change, took up the issue under a new agenda item on "Reducing emissions from deforestation in developing countries: approaches to stimulate actions". Proposed by Papua New Guinea and Costa Rica, it was finally decided last December at COP 13 in Bali. The decision — "Reducing emissions from deforestation and degradation" (REDD) — is a major accomplishment, sending a strong message that developing countries are prepared and willing to reduce emissions.

The Bali conference — already being dubbed "the Forestry COP" — also included "policy approaches and positive incentives related to reducing emissions from deforestation; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries" as part of the Bali Action Plan for a full, effective and sustained implementation of the Convention through long-term cooperative action, which will be part of the new international climate regime that will come into being after the present provisions of the Kyoto Protocol expire in 2012. Thus Bali finally put forestry into the climate equation.

As many agree, compensated reductions under REDD would facilitate more ambitious targets as part of the post 2012 agreement , lower the costs of climate change mitigation, and buy time for research and development of technology to cut future emissions. It will also increase the developing countries' contribution, since deforestation is, for many, the main source of emissions.

There is still much uncertainty about the form REDD mechanisms will take in developing countries — but, as projects and pilots are already being established, it is essential to understand their implications now. The signs are that they are likely to be very context specific, although bound by certain indicative guidance (e.g. under a voluntary non-market approach) and by the fundamental principles of market systems (e.g. under a market based instrument of the post 2012 climate regime).

the future

by Roberto Dobles

There is consensus that methodologies exist, and are good enough, for proceeding with designing the REDD mechanism, addressing such issues as developing emissions baselines (based on historical emissions, taking into account national circumstances) to estimate future reductions, and establishing monitoring and reporting protocols.

Challenges related to governance pose the greatest obstacle. Major institutional and policy ones must be overcome. Significant investment will be needed to develop specialized institutional capacity and technical expertise — and for the process of policy and regulatory reform since deforestation is a side effect of lack of governance, legal uncertainties and non-forest policies

Depending what is driving deforestation, REDD payments could be used to: (a) strengthen existing polices — or create new ones and innovative measures — including law enforcement and capacity building; (b) enhance stakeholders' involvement through such economic incentives as payment for environmental services. The former provides an opportunity for governance reform. The latter is a means of translating carbon payments into effective incentives for sustainable forest management, combining international support and national action.

The question of how these compensated reductions or enhancement of sinks will be financed is left open. The Stern Review of the Economics of Climate Change estimated that halving global deforestation rates over the next decade would cost approximately US$ 5- US$10 billion a year through a system of policy approaches and positive incentives.

There are already payments for carbon sequestration from afforestation and reforestation. However, after the Bali decision on REDD, emission reductions from deforestation and degradation will also be eligible for funding under the Convention, though how this will happen under a post 2012 regime is still unresolved

Forest carbon has been excluded from regulatory markets through concerns about methodology and market stability. It is increasingly recognized that methodological concerns can be tackled and that forest carbon is vital in mitigating climate change.

Market stability concerns have centered around the effect of the potential magnitude of emission reductions from REDD in developing countries on the already determined Kyoto Protocol target for 2008-2012. The post 2012 situation is different. Commitments for the new climate regime have not yet been fixed but are expected to be much more ambitious – so the potential magnitude of REDD credits should provide hope, not concern.

Combining an ambitious long-term target with shorter Kyoto-type commitment periods could create a robust balance between the demand for and supply of emissions reductions from deforestation and the enhancement of carbon stocks by sustainable forest management. Market stability is therefore, a weak argument against REDD credits.

Developing countries wishing to reduce their emissions from deforestation must have immediate access to the carbon market, since early action will provide early learning. Banking and grandfathering REDD compensated reductions will help grasp opportunities that may not be around for long on present trends.

Decisions to convert forests fail to account for the value of the environmental services they provide. Since these externalities don't enter the cost-benefit equation, the social costs of deforestation exceed the private gains, and forests will continue to be converted or degraded.

In 1950, half of Costa Rica was covered by forest, but this declined rapidly to 29 per cent by 1986. Over the last decade the country has tuned the tide, on both public and private lands. Deforestation is more than counterbalanced by reafforestion and regeneration of abandoned productive land, and forest cover is almost back to the 1950 level.

This success is due to a remarkable set of institutional innovations and legal reforms in the mid 1990s. In 1996, for example, a new law explicitly recognized forests' environmental services and gave private landowners compensation under a contract where they undertook to protect the forest land for 20 years. Simultaneously, Costa Rica moved aggressively, establishing a National System of Conservation Areas under the Ministry of Environment and Energy. Thus, by the end of the 1990s, a novel set of institutions was ready to mediate the creation of markets for forest environmental services, with the government acting as an intermediary.

Forest ecosystems protection is an issue of public good, and it is hard to conceive of an effective and equitable solution without appropriate compensation for those that provide them.
REDD is particularly important as it provides a unique market incentive for tackling some of the underlying market and governance failures.

From a market perspective, it brings together the demand and the supply sides of the problem by making sustainable forest management more attractive. As for governance, it provides an opportunity for reform and reducing opportunity costs.

If countries want to engage with forest carbon markets, they need to tackle failures of governance and policy. Governments and donors must also invest in capacity building. All this will reduce transaction costs and risks to buyers, and thus increase the demand, and willingness to pay, for ecosystem services. However, fully including REDD credits in the carbon market will only be possible once there is a long-term global post 2012 climate regime. UNEP

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time to adapt

by Martin Parry

As every month goes by it becomes increasingly clear that we will need to adapt to climate change. Of course, early action needs to be taken to mitigate it by reducing emissions of greenhouse gases, but this must be complemented by investment in adaptation in the places most affected. The sooner we put resources into adaptation the less damage will be sustained.

The latest assessment by the Intergovernmental Panel on Climate Change (IPCC) came to the new conclusion that the effects of climate change are occurring now. The Earth has already warmed by 0.5 degrees C due to increases in atmospheric greenhouse gases, and we can observe the effects of this on every continent — most troublingly the current drying and warming in Africa's Sahelian region, and the effects of sea-level rise on coastal flood plains and small islands. Inevitably, some adaptation is also occurring now but little of this is planned and almost no additional resources have yet been deployed toward it.

Some further warming is inevitable. Even if we were to cut emissions both immediately and so enormously that greenhouse gas concentrations in the atmosphere are stabilised at current levels — an impossible task — a temperature increase of a further 0.6 degrees C would still be inevitable due to thermal lag of the oceans and atmosphere. So 1.1 degrees C of climate change is the very least that we should plan for. The impacts from such an increase will probably include: reduced water availability — with consequent falls in agricultural productivity — in the dry tropics; increased coastal flooding; and increased morbidity and mortality from heat waves and droughts. Adaptation is the only way of avoiding or reducing these.

Humans have, over many generations, developed great capacity to adapt to extreme weather conditions. We know, for example, what farming systems work best in drought-prone areas, and what sea-defences protect best on low-lying coasts. Much effort goes into protecting our activities from the adverse effects of weather, as well as into making the most of the benefits that good weather can bring. Adapting to climate change would mean deploying this wealth of knowledge to meet the new changes in weather that will result. But our capacity to adapt will probably be exceeded if we do not reduce emissions very soon.

We cannot say precisely how much climate change we can adapt to, but it is unlikely to be much above 1.5 degrees C simply because many of the plants and animals that supply our food would be stressed in warmer conditions. Genetic modification might find a way through, but this is far from certain. Thus, if greenhouse gas emissions are not reduced both substantially and soon, we could be locked into a pathway leading to temperatures that ultimately exceed our adaptive capacity. Mitigation and adaptation have, therefore, to be seen as complementary. We can neither mitigate nor adapt our way wholly out of this problem. Both strategies are needed together.

We now have a picture, from the latest IPCC assessment, of the regions and systems and sectors most affected by climate change. This can be used as a priority shortlist for targeting resources for early adaptation: The most affected regions are likely to be:

- Africa, because of projected drying there, together with the region's low capacity to adapt;
- small islands, because of high exposure and projected sea-level rise
- mega-deltas in Asia and Africa, due to large populations and sea-level rise;
- the Arctic, because of high rates of projected warming.

The most affected systems and sectors are likely to be:

- water resources in already-dry parts of the world, especially the semi-arid tropics;
- agriculture in these same regions;
- low-lying coasts;
- human health, especially in poor areas; and
- particular ecosystems that are prone to damage from warming — such as tundra, boreal forest, and mountain regions — or already weakened by other current stresses like mangroves, salt marshes, and coral reefs.

Adaptation is a 'win-win' strategy. Most of the adaptive actions we would wish to take to reduce damage from climate change are, in fact, ones we need to take anyway to protect ourselves and our activities from today's weather. For example, protecting farmers in north-east Brazil from the current risk of drought — such as by introducing drought-resistant crops, or catching and retaining water and using it more efficiently in drip-feed irrigation — also serves to increase their resilience against increased drought from climate change. The same is true for adaptation in coastal protection, in primary health care or wildlife management. Investment in adaptation can therefore yield near-term benefits and, at the same time, protect against the medium-term future.

It is clear from the IPCC assessment that there is a two-way street linking climate change and sustainable development: Climate change can threaten attainment of the Millennium Development Goals. But the corollary is that sustainable development can make a community or region much more resilient to damage from climate change. There are therefore two sound reasons to 'mainstream' adaptation into the development process.

Until recently those advocating adaptation were accused of defeatism, of implying that mitigation would not succeed. We need now to be pragmatic, and recognise that we cannot mitigate our way wholly out of the climate change problem. A portfolio of adaptation and mitigation strategies is needed to confront this huge issue. For too long adaptation has been the poor sister of mitigation. Now it needs the resources to do the job. UNEP

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by Mari

Opinions and assessments of the results of December's climate negotiations in Bali vary according to the level of expectation. For Brazil, the outcome of the 13th Conference of the Parties of the United Nations Framework Convention on Climate Change, was less than the seriousness of the problem requires but, undoubtedly, significant progress was achieved and this should not be underestimated. Bali reinforced the understanding that — in spite of their different interests, needs, circumstances and priorities — all nations must contribute to solving such a serious problem as climate change. There is still no better alternative to the multilateral system for consolidating this collective effort, even though its capacity to provide appropriate responses to global problems leaves room for doubt.

The international community's expectations for Bali were raised substantially in a year which had climate change was at centre of the global agenda. For international institutions, governments and citizens, the reality emerging from the data published by the Intergovernmental Panel on Climate Change is unequivocal, visible to the naked eye and leading to the almost unanimous conclusion that urgency, responsibility and commitment are required. The issue has now most definitely left the desks of scientists and negotiators to permeate the concerns of whole sectors of society; these are now not only better informed, but better trained to intervene and propose alternatives to join the wide array of policies and technical solutions to address the problem.

For developing countries, the Bali conference was an excellent opportunity to demonstrate their commitment to participating in global efforts to combat climate change. This helped deflate the arguments of some developed countries which — when called upon to shoulder their own responsibilities — protected themselves by pointing a finger at nations that historically have contributed little to the problem. Brazil vigorously defended the concept in Bali that developing countries, recognizing that they are part of the problem, should show the world that — within their specific circumstances — they are also part of the solution.

The oft repeated principle of common but differentiated responsibilities should not be used to hide or evade obligations. Brazil's actions over climate change concentrated on its common responsibility — towards its own population and that of the world - -rather than on the unacceptable position of waiting for developed nations, the ones most responsible for the situation, first to do their part. We therefore supported the Bali decision that developing countries should adopt suitable mitigation actions — through programs and policies to reduce emissions — that are measurable, reportable and verifiable. This historic decision, for the first time, very clearly translates the provisions of the Convention that establish the common responsibilities of all countries.

It must be said, however, that this was not easily accepted by developing countries. When invited to take part in solving a problem to which, historically, they have barely contributed, several pointed to the inconsistency of the developed countries, which not only have done little at home, but have failed to meet their international commitments to support developing countries — through financial resources and technology transfer — in pursuing socially, environmentally and economically sound development models. For the world's poorest nations, the ones certainly that will be most affected by the perverse effects of climate change, this is not an acceptable form of leadership.

Despite being very controversial, the developing countries' acceptance of language that made their commitments to the Convention very clear neutralized the reactive attitude of developed ones who still resisted their own role. Although a timid and unambitious text, the decision approved by the Bali Conference led to a consensus that represents a significant result: it opens the doors to a new round of negotiations, which will finally be based on the perspective that all countries are part of the solution.

Brazil's Environment Minister Marina Silva was named a UNEP Champion of the Earth in 2007. The award is given annually to seven outstanding environmental leaders who have significantly influenced the protection and sustainable management of the planet's environment.

Each issue of Our Planet features the views of one of UNEP's Champions. For more information on the UNEP Champions of the Earth award see http://www.unep.org/champions/.

Champions of the Earth

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na Silva

The period that now begins — when we are all invited to implement the Bali Plan of Action — must be marked by a responsibility in keeping with the urgency and commitment that the problem demands. Developed and developing countries recognize their responsibilities, but there will need to be equality in the negotiations now starting. There is no way to pare down the rich countries' enormous and incomparable responsibility over climate change: it cannot be divided with the other nations of the planet.

If we seek equality in solving the problem, this will take place at the moment when the more developed countries adopt — with due haste, and in a mandatory and binding way — the non-transferable measures they owe the planet. Developing countries also have commitments, but they are of another kind and depend on assistance if they are to be accomplished without compromising the basic, and ethical, need to provide goods and services — such as food and energy — to millions of people that lack them.

What is at stake is the conceptual and practical construction of this equality. Brazil has much to say. We are in favour of developing countries participating more in the global efforts to mitigate climate change: this strengthens the sense of commitment to policies and measures that lead to effective and concrete results. In practice we have undertaken an intensive series of domestic actions in the last three years that have resulted in an accumulated reduction of about 60 per cent in our rates of deforestation, our largest source of emissions. We have also made continuous efforts to control and reduce greenhouse gas emissions in other sectors: over the past five years, Brazil's energy based emissions have grown less than GDP, showing that it is possible to promote growth without increasing emissions at the same rate.

Brazil also starts the new year in the light of an unprecedented decision in Bali that establishes the basic guidelines for encouraging action to reduce emissions arising from deforestation. At the conference we presented the elements of a National Demonstrative Project for Incentives for Reducing Emissions from Deforestation. This proposes creating a voluntary investment fund to combat deforestation and promote forest conservation based on resources provided by countries, businesses and institutions proportionate to the reduction in emissions. The Project, which will start in 2008, developed the idea of positive incentives for reducing emissions from deforestation, using the Amazon as an example.

The idea is that Brazil could provide recognition to interested donors based on a scientifically proven monitoring system and a fund to administer their contributions to emissions reductions. These resources would be managed by a steering committee made up of federal and state governments, academia, the business sector, NGOs and social movements.

This is just one example of the opportunities provided by the Convention to reduce emissions without compromising national strategies, priorities and demands. Discussions over the next two years should include the paths that international society must follow to deal adequately with one of the planet's greatest threats. It is, therefore, essential that all nations realise that solving the climate change problem implies, first and foremost, meeting the needs of the Earth, of its ecosystems and of its most vulnerable citizens. Economic growth and maintaining consumption patterns cannot be seen as the only way of meeting humanity's needs. Incentives are required to change development models - but so are policies, options and decisions based on doing what is right. And this necessarily implies some kind of surrender and sacrifice, both national and personal. UNEP

action time

by Monique Barbut

December was a banner month for the overarching issue of climate change. In the space of just five days, the issue was the real star at the Nobel Peace Prize award ceremony and the world's governments signed the Bali Action Plan as a new roadmap towards solutions. Together, the two events helped to shift global discourse exponentially.

The Bali meeting marks a major turn in the international community's effort on addressing how we adapt to climate change. Communities have adapted to climate variability for centuries, using indigenous knowledge and ingenious makeshift solutions. This type of approach falls far short of what is now required in the face of global warming. The evidence of people around the developing world who can testify firsthand about its ravages is overwhelming. They have watched helplessly as their farmlands flood, their coastlines erode, and their crops, homes, and livelihoods are destroyed.

Such outcroppings of climate change have quietly, but fundamentally, reshaped the policy debate. For more than a decade, the global community has battled over requiring industrialized countries to reduce greenhouse gas emissions. These "mitigation" strategies, including the Kyoto accord, are invaluable, if still too timid. But the new policy thrust is "adaptation"—changing how things are done in order to minimize global warming's effects on food supplies, drinking water, irrigation and public health, particularly in the developing world. Adaptation has long been the orphan child of the climate change movement. Real and significant action on it can go a long way toward solving the present and future ills of global warming.

Adaptation's painful paradox is that the poorest developing countries bear almost no responsibility for climate change since their emerging economies emit small amounts of greenhouse gases. Yet they are often those hit hardest by global warming and least able to pay for adaptive measures like crop insurance, malaria and dengue fever treatment, new crop varieties more resistant to drought and flood, and infrastructure protection against natural disasters and floods amplified by climate change.

One of Bali's most awaited decisions was an agreement immediately to bring to life the Kyoto Protocol's Adaptation Fund that had been in the planning stage for several years. The Global Environment Facility (GEF) was selected to serve as its secretariat, and its organizational work has already begun operating under the authority of the Conference of the Parties/Meeting of the Parties of the UN Framework Convention on Climate Change (UNFCCC). The secretariat will assist the Fund's board, facilitating its work in developing operational policies and guidelines, deciding on projects, and allocating funds in line with the Adaptation Fund principles, criteria, modalities, policies and programmes.

Uniquely, the Fund will obtain most of its finance from a two per cent share of the proceeds of the Clean Development Mechanism where industrialized countries trade emission rights with less polluting developing ones. This will give developing countries a stronger voice in managing it as they take a special interest in how the resources they are contributing are used.

The Fund also differs from previous GEF practice in that countries will now be able to submit their proposals directly to its Board — which will decide precise modalities and conditions — without necessarily going through an implementing or executing agency.

The immediate challenge is to make the best use of resources. Fortunately the GEF has over a decade of experience in funding adaptation. In February 1997, it provided $6.8million for implementing the Caribbean Planning for Adaptation to Climate Change project — the first such project funded by the GEF and one of the first worldwide to include both action and capacity building in this field. As the issue became more of a priority for many developing countries, the GEF responded to UNFCCC guidance by establishing the Strategic Priority on Adaptation worth $50million. This has supported numerous projects worldwide. focusing on pilot and demonstration ones that generate real benefits on the ground: examples include:

- The Kiribati Adaptation Programme;
- Integrating Vulnerability and Adaptation to Climate Change into Sustainable Development Policy Planning and Implementation in Southern and Eastern Africa,
- Participatory Coastal Zone Restoration and Sustainable Management in the Eastern Province of Post–Tsunami Sri Lanka and
- The Integrated National Adaptation Project in Colombia.

In 2001 the UNFCCC established the Special Climate Change Fund and the Least Developed Countries Fund, requesting the GEF to manage them, with adaptation the top priority. These funded many National Adaptation Programmes of Action in Least Developed Countries, along with such concrete action as the Conservancy Adaptation project in Guyana. Work is under way on a project for Reducing Climate Change induced Risks and Vulnerabilities from Glacial Lake Outburst in the Punakha-Wangdi and Chamkhar Valleys in Bhutan. This process has attracted over $270 million in additional funding for adaptation projects and programmes worldwide.

All this is good: but is it enough? After Bali we must start the equally important and demanding task of anchoring the Adaptation Fund in a much broader international architecture to deal with the fundamental changes to life on earth brought by climate change. This touches the livelihoods of developed and developing countries and of rich and poor people and all sectors of society and the economy.

One recent World Bank study estimated that, globally, the annual incremental costs of adapting to projected climate change are likely to lie in the range of $10-40 billion. Many developing countries simply will not be able to manage this on top of their existing development challenges. Additional support will be needed. Another study estimated that nearly 40 per cent of all development projects demonstrate some form of vulnerability to climate change: the significant costs of changing them will prove a burden for many poorer developing countries. So new innovative policies must be put in place, and further resources will be required.

Financing adaptation to climate change requires three things. First, it requires us to re-examine the nature of conventional development through the prism of vulnerability to work out how and where we need to do it differently. "Climate-proofing" existing development programmes is essential to make future growth more resilient. Developing countries will have to incorporate adaptation to climate change into all their developmental policies and priorities. This will reduce both their vulnerability and the cost of adaptation, while increasing their resilience.

Second, adaptation will require new investment and financing for activities that would not previously have been needed. For example, vector-control programs will have to be implemented in areas where changing temperature and rainfall patterns create a new environment for such diseases as malaria and dengue fever. Similarly, new investments in flood management will be required when a flood that has been recorded every 50 years begins to occur every five, or settlements may have to be abandoned and populations re-located.

Third, since the entire world will have to learn to adapt, joint and coordinated action will be necessary: isolated initiatives will not achieve the objectives desired. International cooperation will have to put less emphasis on who contributed what, and more stress on the actions that — if undertaken as a joint endeavour — will neutralize negative effects on the people's lives and livelihood. The balkanization of world climate change efforts must be avoided.

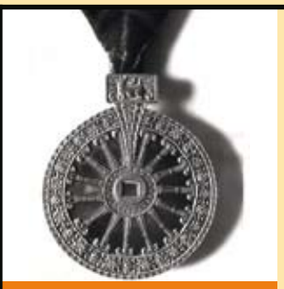
These perspectives must be entrenched firmly in the Post Kyoto institutional arrangement if the world is to make a dent in dealing with climate change.

awards and events

Bali climate change conference

The **Bali Climate Change Conference** in December – the key climate change meeting of 2007 – brought together more than 10,000 participants from 180 countries in a bid to agree on the process towards a post-Kyoto agreement. The arduous negotiations culminated in the adoption of the Bali roadmap, which charts the course for a new negotiating process to be concluded by 2009 that will ultimately lead to a post-2012 international agreement on climate change. The heat is now on for countries around the world to agree on a treaty to succeed the Kyoto Protocol. Other key decisions taken at the meeting include the launch of the Adaptation Fund as well as decisions on technology transfer and on reducing emissions from deforestation.
http://unfccc.int/meetings/cop_13/items/4049.php

UN Climate Change Conference 2007
Bali - Indonesia



Elizabeth Haub award for environmental diplomacy

Former UNEP Executive Director Klaus Töpfer was awarded the **Elizabeth Haub Award for Environmental Diplomacy** in December in recognition of "excellence in advocating for global environmental stewardship". The prize, given out every year by the International Council of Environmental Law, recognizes eminent individuals' "positive contribution to the development and promotion of international law and policy in a general way". During his time as UNEP's Executive Director from 1998 to 2006, Mr. Toepfer played a key role in addressing major environmental issues including the 2004 Asian tsunami. As Germany's Environment Minister in 1987-1994, he introduced groundbreaking environmental regulations and actively contributed to the success of the Earth Summit in Rio de Janeiro in 1992. He was also a forerunner in the negotiations for the United Nations Framework Convention on Climate Change and the establishment of the Global Environment Facility.
http://www.kssf.de/EHF/English/ehf_awards.htm

B4E and champions of the earth

B4E, the Global Business Summit for the Environment is a major international conference focusing on business and the environment in Asia. It will highlight the environmental challenges facing global business today and share strategies and best practices for corporate environmental responsibility. The summit, now in its second edition, will take place in Singapore on 22 April in the fringes of this year's **Champions of the Earth** ceremony. The UNEP prize, given out every year, celebrates individuals from every region of the world who have shown extraordinary leadership on environmental issues.
http://www.unep.org/champions/

B4E
Champions of the Earth

world migratory birds day

World Migratory Birds Day, on 10-11 May, will focus on the theme 'Migratory Birds - Ambassadors for Biodiversity'. The event, which has taken place in May for three years running, is a global awareness campaign that aims to inspire people to take action for the conservation of migratory birds. Birds are some of the best indicators for the status and trends of biodiversity around the world, as they inhabit virtually all the ecosystems in the world. Throughout their annual cycle, migratory birds cross many countries and continents, some of them from the tundra to the tropics, linking different ecosystems. By conserving them and their environment, we ensure the conservation of biodiversity on a wider scale.
http://www.worldmigratorybirdday.org

World Migratory Bird Day

conference of the parties to the convention on biological diversity

From 19 to 30 May 2008 Bonn will host the 9th Ordinary Meeting of the **Conference of the Parties to the Convention on Biological Diversity**. This key meeting will see more than 5,000 delegates from all over the world meet to discuss the protection and the preservation of species and habitats, the sustainable use of biological diversity as well as how to fairly distribute access to natural resources. As a crucial safety net against climate change, biodiversity is higher than ever on the global environment agenda. Global warming is already threatening biodiversity, causing coral bleaching and endangering many species which rely on their unique habitats in order to thrive. But biodiversity resources can reduce the impact of climate change by helping to absorb CO2, fight flooding through mangroves and drought-resistant crops, and strengthen ecosystem resilience.
http://www.cbd.int/doc/?mtg=cop-09

Convention on Biological Diversity

international year of the reef (IYOR)

The **International Year of the Reef** 2008 seeks to draw attention to coral reefs as key elements of the ocean environment. Led by the International Coral Reef Initiative (ICRI), the worldwide event will raise awareness about the value and importance of coral reefs and threats to their sustainability, and aims to motivate people to take action to protect them. The first IYOR was declared in 1997 in response to the increasing threats and loss of coral reefs and associated ecosystems. Ten years later, there remains an urgent need to increase awareness and to further conserve and manage coral reefs and associated ecosystems. IYOR 2008 will be a year-long campaign of events and initiatives hosted by governments, individuals, corporations and schools around the world to promote coral reef conservation. The first event will be the launch of a report on the 2005 coral bleaching in the Caribbean that affected more than 80 per cent of the reefs in the region.
http://www.iyor.org/default.asp

IYOR 2008
INTERNATIONAL YEAR OF THE REEF

great rift valley earth festival

The **Great Rift Valley Earth Festival** is a weekend-long festival of art and music on 22-24 February in Kenya's Laikipia Nature Conservancy. The event is organized by Kenya-based environmentalist Kuki Gallmann in support of UNEP's climate change awareness campaign and the UN Millennium Development Goals. The festival was conceived in order to raise environmental awareness through art, by bringing together artists from around the world — with 180 musicians, dancers and other performers from Africa, Europe, the Americas and the Middle East. Water, 'Aqua' has been chosen as the theme of the event, and all proceeds will go to water projects to help communities in the Great Rift Valley area.
www.gallmannkenya.org

GREAT RIFT VALLEY EARTH FESTIVAL

WWW

Financing Action On Climate: Useful Links

This page contains links to websites from governments, international organizations, non-governmental organizations, businesses, media, and other groups from around the world to help you research issues related to finance for climate change action. We have compiled these links from our own review of the vast amount of information available on the Internet to help you to find the most relevant sources for your research. Our Planet magazine does not, however, endorse the viewpoints of any of the groups to which we link, and we cannot guarantee the accuracy of the information posted on these sites. Rather, we hope to provide you with a broad range of opinions and perspectives.

www.unep.org/tools

The UNEP 'resource kit' webpage features a range of technical guidelines, tools and resources for governments, policy-makers, civil society, private sector and the public at large. The page can be searched thematically, with areas including 'business and industry', 'technology' and 'climate change'. Available information includes technical guidelines, clearing-houses, trainer manuals, databases, CDroms, publications and other useful tools.

UNEP — Mobilizing finance against climate change

www.unepfi.org
The UNEP Financial Initiative is a global partnership between UNEP and the financial sector. Over 160 institutions, including banks, insurers and fund managers, work with UNEP to understand the impacts of environmental and social considerations on financial performance.

sefi.unep.org
SEFI is the UNEP Sustainable Energy Finance Initiative — a platform providing financiers with the tools, support, and global network needed to conceive and manage investments in the complex and rapidly changing marketplace for clean energy technologies.

www.unep.fr/energy/finance
Through its Renewable Energy and Finance Unit, UNEP has implemented a variety of 'financial catalysts' — including seed financing and enterprise development, credit enhancements and financier advisory support services.

http://www.unep.fr/energy/act/pol
This is UNEP's energy policy website, outlining the organization's current activities in the energy field from hydrogen to awareness raising and capacity development. The idea is that in order to support the shift to a global energy system that supports the objectives of sustainable development, it is crucial to provide timely and accurate information to illustrate the link between the energy choices policymakers face and broader sustainable development issues.

http://sefi.unep.org/english/home/publications/download-report.html
This is the link to the 2007 Global Trends Report of the Sustainable Energy Finance Initiative (SEFI).

www.unep.fr/energy/projects/frm/frm_mainpage.htm
This is the website for UNEP's 'Assessment of Financial Risk Management Instruments for Renewable Energy Projects'. This UNEP/GEF targeted research project aims to catalyse new thinking in the risk management area, examining existing tools and approaches and suggesting potential new instruments that could be developed in partnership with private and public sector financial institutions.

http://www.unep.fr/energy/tools/ghgin
This website provides access to UNEP's GHG Indicator, a programme which calculates greenhouse gas emissions (GHG) for businesses and non-commercial organizations.
As the business sector is increasingly called upon to pull its weight in the fight against climate change, this is an invaluable tool to help companies and NGOs account for and report their CO_2 emissions. Through easy to use worksheets, the website provides a method for converting information on fuel and energy use into estimated GHG emissions.

http://www.unepsbci.org/
UNEP's Sustainable Buildings and Construction Initiative (SCBI) is a global partnership between UNEP and worldwide leading companies to promote and support sustainable solutions in the buildings and construction sector. The SCBI website provides stakeholders with a common platform to promote the adoption of sustainable construction practices.

International bodies

www.climateactionprogramme.org
The Climate Action website aims to assist businesses and governments towards carbon neutrality — it encourages the sharing of best practice and the development of new technologies and initiatives.

www.incr.com
The Investor Network on Climate Risk (INCR) is a $4 trillion network of investors that promotes better understanding of the financial risks and opportunities posed by climate change.

www.iigcc.org
The Institutional Investors Group on Climate Change (IIGCC) is a forum for collaboration between pension funds and other institutional investors on issues related to climate change.

www.climatetrust.org
The Climate Trust is a leading non-profit organization dedicated to providing solutions to stabilize our rapidly changing climate.

www.ren21.org
REN21 — the Renewable Energy Policy Network — is a global policy network that provides a forum for international leadership on renewable energy. Its goal is to bolster policy development for the rapid expansion of renewable energies in developing and industrialized economies. UNEP co-hosts the REN21 Secretariat with GTZ, the German technical cooperation enterprise.

www.climateark.org
Climate Ark is an Internet search tool that provides access to reviewed climate change, global warming and renewable energy conservation news, information retrieval tools, and original analysis and action opportunities.

www.developmentfirst.org
The Development and Climate Project is an initiative of 12 institutes from developing and developed countries. It explores the idea that a less polarized way of meeting the challenges of sustainable development and climate change is to build environmental and climate policy upon development priorities that are vitally important to developing countries. The idea is to help develop an alternative strategy for establishing co-operation on climate change between developing and developed nations.

www.pewclimate.org
The Pew Center on Global Climate Change was established in 1998 as a non-profit, non-partisan and independent organization. The Center's mission is to provide credible information, straight answers, and innovative solutions in the effort to address global climate change.

www.gefweb.org
The Global Environment Facility's projects in climate change help developing countries and economies in transition to contribute to the overall objective of the United Nations Framework Convention on Climate Change (UNFCCC). The projects support measures that minimize climate change damage by reducing the risk, or the adverse effects, of climate change.

www.wmo.int
The World Meteorological Organization is a specialized agency of the United Nations. It is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources.

www.gnesd.org
The UNEP-facilitated Global Network on Energy for Sustainable Development (GNESD) engages more than 20 centres of excellence in developing and industrialized countries to provide policy solutions for clean and efficient energy sources for the world's poor. It has produced a series of targeted reports on energy access and conducted regional workshops with UNEP, UNDP and the International Energy Agency (IEA).

driving change

by Nicky Gavron

Cities have an extraordinary responsibility and motivation to act on climate change. They consume three quarters of the world's energy and are responsible for four fifths of its carbon dioxide emissions. They are also highly vulnerable to the resulting impacts of climate change: to take one example, about 20 of the world's 30 largest cities, London included, stand on low lying coasts.

They also have great opportunities. Concentrating people and activities at high densities, they can use energy, materials and land efficiently. They are the places where high level, knowledge-based activities congregate, with the expertise to tackle climate change. Many are the drivers of their national economies. Five US cities — New York, Los Angeles, Chicago, Boston and Philadelphia — together constitute the world's fourth largest economy. Bangkok and Sao Paulo with just 10 per cent of their countries' populations, generate 40 per cent of national wealth.

Innovation and progress in taking action on climate change action is most likely to be achieved in cities. Mayors and their municipalities have the powers and levers to reduce carbon emissions, and can show leadership in taking decisive and radical action. They control the development of land, have housing powers, and regulate — and often manage — transport. They have varying degrees of responsibility for collecting and processing waste and such other environmental infrastructure as energy and water. They own and manage buildings and vehicle fleets. And they have huge purchasing power. Although leadership from national governments is crucial in negotiating international agreements, setting frameworks and standards and providing fiscal and financial incentives, cities must lead when it comes to practical action on the ground.

All over the world, city governments are taking their own initiatives, recognising the need to cooperate across national and international boundaries. Almost one thousand municipalities have made substantial carbon reductions through the 'Cities for Climate Protection' campaign of ICLEI-Local Governments for Sustainability. Over 750 US mayors are mobilising to meet or beat Kyoto targets.

In October 2005, many of the world's largest cities met in London and established the Large Cities Climate Leadership Group, agreeing — amongst other things — to create municipal procurement alliances, jump-starting the supply and demand for climate change technologies and measurably influencing markets. The next year its chair, Ken Livingstone, Mayor of London, joined with former US President Bill Clinton to launch a partnership with the Clinton Foundation Climate Initiative (CCI), which acts as the Group's operational arm, working on accelerated progammes of carbon reductions in each city.

Participation in what has now become the C40 Cities Climate Leadership Group spans the globe: including Berlin, Buenos Aires, Cairo, Caracas, Chicago, Delhi, Dhaka, Houston, Istanbul, Johannesburg, Karachi, Lagos, London, Los Angeles, Madrid, Melbourne, Mexico City, Moscow, New York, Paris, Rome, Sao Paulo, Seoul, Shanghai and Toronto — and an affiliated group of smaller cities — such as Curitiba and Copenhagen — that are exemplars of innovative practice. C40 cities are expected to act as catalysts for change within their country or region.

We have plenty of best practice to share. The city of Berlin in partnership with the Berlin Energy Agency organises retrofits for large government and commercial buildings, achieving energy efficiencies of around 24 per cent. So far, 1,400 buildings have been upgraded, delivering CO_2 reductions of more than 60,400 tonnes annually. These retrofits cost the owners nothing and the buildings make immediate savings. Average payback periods are between 8 and 12 years.

Similarly Copenhagen's district heating system supplies 97 per cent of the city with clean, reliable and affordable heating by capturing waste heat from electricity production, normally released into the sea, and channelling it back through pipes into peoples' homes. The system cuts household bills by €1,400 — and saves the emission of 665,000 tonnes of CO_2 — annually.

Bogotá recently introduced a Bus Rapid Transit system through the city — with 850 buses used daily by 1,400,000 passengers — which has reduced travelling time by 32 per cent, taken 2,109 public service vehicles off the road, and cut greenhouse gas emissions by 40 per cent. Seoul's car free day has succeeded in taking two million cars off the road every year, decreasing traffic volume by 3.7 per cent, and $C0_2$ emissions by 9.3 per cent. Chinese cities — including Shanghai and Beijing — have been developing similar initiatives. And Paris has introduced a scheme that has revolutionised the streets and the way people get around: over 10,000 brand new self-service bicycles went up for rental at 750 ranks across the city — and in the first two months were used five million times.

As soon as London's first directly elected Mayor took office in 2000, he set an overarching vision: "to develop London as an exemplary sustainable world city". The London Plan and its related strategies — transport, economic development housing, energy, and waste, — took that vision as their starting point, as have initiatives such as congestion charging. In February 2007, all policies and implementation programmes were pulled together into the London Climate Change Action Plan, setting the ambitious target of reducing London's carbon emissions by 60 per cent by 2025. The Action Plan is a comprehensive, holistic approach addressing transport, new and existing buildings, energy supply and aviation as well as seeking fundamental changes in behaviour.

C40 launched its first procurement package at the second climate summit hosted by New York's Mayor Bloomberg, in May 2007. The Energy Efficiency Buildings Retrofit programme, developed by the CCI exemplifies the approach of negotiating deals between customers, suppliers and financial institutions to establish economies of scale, reduce costs and accelerate the introduction of technologies. The initial deal involved sixteen cities, four energy services companies and five banks offering city authorities and building owners an energy audit, and a comprehensive discount on the goods and services to achieve emissions reductions. The financing comes from energy savings and is underwritten by the banks. This will be followed by procurement programmes on transport and waste, among others, in a new way of doing business that scales up and catalyses markets for public goods and services. Once developed, these programmes will be opened up to other cities.

Adaptation to climate change is another crucial area of engagement. Many cities are already hit hard by it. Asia, for example, is threatened by flooding, storm surges and sea level rise — with cities in low lying areas along the east and south China coast, and the delta of South and South East Asia, particularly vulnerable. C40 has an important role to play in ensuring that best practice is shared between cities and that adaptation measures are consistent with reducing emissions. The economic benefits of wise adaptation strategies that dovetail with mitigation measures should be a focus for cities in 2008.

At the international negotiations in Bali last December, an unprecedented coming together of key organizations, representing Mayors and local governments worldwide, launched a global agreement to accept responsibility for addressing the challenge of climate change and seize the economic opportunities it presents. The climate debate has shifted from whether the scientific evidence demands global mandatory targets to what level those targets should be and how to meet them. No global partnership on climate change can be delivered without the full involvement of cities. The C40, working with other city networks, can be globally significant in making deep cuts in carbon emissions, and reconfiguring global markets for cutting edge technologies. If this is to be achieved — and the highest reduction targets reached — governments need to put cities in the driving seat. UNEP

scaling-up actio

Last December, the world took a significant, yet fledgling first step towards helping developing countries adapt to climate change. Meeting in Bali, governments decided to operationalise the Kyoto Protocol's Adaptation Fund that will finance adaptation projects in its developing country Parties. Yet the its modalities still need attention, and the actual scale of financing and action needed for adaptation is far greater than is currently envisaged under the Fund. The key concern is whether the consensus achieved at Bali — at the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and Meeting of the Parties to the Protocol — will result in sustained, collaborative action that will improve, rather than worsen, the well-being of millions of poor and vulnerable communities facing the worst impacts of climate change.

Adaptation practices are by definition, locally specific, context dependent and dynamic. These factors — coupled with financing, technological and capacity limitations — make adaptation a difficult challenge for the vast majority of developing countries. But there is clearly little benefit and large costs in avoiding or delaying its implementation. Without adaptation, the annual costs of climate change impacts are estimated to range from several percent to tens of percent of gross domestic product in exposed developing countries; more significantly, much of the costs will be in the form of severe economic shocks.

There is also ample evidence that the adverse effects of climate change will fall disproportionately upon the least developing countries (LDCs) and small island developing states (SIDS) — and on the poor and vulnerable within all countries. The recent cyclonic devastation wrought upon low-lying coastal communities in Bangladesh provides tragic evidence of this. The Stern Review cautions that: "Climate change poses a real threat to the developing world. Unchecked it will become a major obstacle to continued poverty reduction." The 2007/2008 Human Development Report goes even further: "International cooperation on adaptation can be thought of as an insurance mechanism for the world's poor…For governments concerned with achieving progress toward the Millennium Development Goals (MDGs) over the next decade, and building on that progress afterwards, adaptation is the only option for limiting the damage caused by existing climate change."

Intergovernmental financing for adaptation is not currently seen as part of the broader global financing effort for the MDGs or poverty reduction. Two intergovernmental mechanisms for adaptation have been developed under the guidance of the UNFCCC for implementation by the Global Environmental Facility — the Least Developed Countries Fund (LDCF) and the Special ClimateChangeFund (SCCF).

The first was established to help LDCs achieve climate — resilient development by increasing their adaptive capacity and reducing their vulnerability. Countries first prepare National Adaptation Plans of Action (NAPAs), which identify activities where further delay could increase vulnerability, or lead to increased costs at a later stage. To date, 44 NAPA preparation proposals and two global support projects have been approved for funding by the GEF, and of these, 22 NAPAs have been submitted to the UNFCCC. The second was designed to finance activities complementary to those funded by GEF in: adaptation to climate change (which has top priority); technology transfer; energy, transport, industry, agriculture, forestry and waste management; and economic diversification, The GEF also operates a pilot programme the Strategic Priority on Adaptation.

From a developing country perspective, climate change adaptation and sustainable development cannot be seen as separate or competing issues — and thus financing for climate change cannot be seen in isolation from financing for development. The challenge of adaptation will be particularly acute in LDCs and SIDS where the greatest vulnerability to climate change impacts coincides with the greatest resource and capacity constraints. Consequently, there is an urgent need to increase support for immediately developing and implementing NAPAs.

The existing literature reveals a substantial and serious lack of accurate and reliable methodologies and tools for estimating adaptation costs and climate related risks, with serious implications for the effective funding and operationalization of any proposed intergovernmental or global mechanism, including the Adaptation Fund.

The key analytical limitations in estimating adaptation costs are especially troubling as is the lack of reliable and accessible national costing tools and methodologies on relevant adaptation practices, The UNFCCC has highlighted four estimation methods in a Background Paper, noting key uncertainties associated with all of them:

- A complete bottom-up approach which involves estimating the costs of specific adaptations: but only partial information is available, based on the NAPAs and national communications, and this approach is "far from being comprehensive and complete."
- Extrapolating estimated

on

by Anilla Cherian

adaptation costs drawn from NAPAs to the rest of the developing world using population, income and land. Oxfam America estimates that adaptation costs will be more than USD 50 billion per year, but the UNFCC notes this the extrapolation "is based on a limited number of NAPAs" that are only focused on "urgent needs".

- Analyses which use current global expenditures on agriculture, forestry and fisheries to apply a rule of thumb for estimating additional costs for meeting development and adaptation needs. But assumptions have to be made about additional costs which could yield large differences in estimates when applied to a large base.
- Top-down quantitative analyses which can give a rough estimate of total costs, but typically do not capture site-specific differences. Furthermore, the UNFCCC points out, these may not be comprehensive and the use of different assumptions for models can result in different estimates of magnitude.

So rather than wasting valuable time and limited resources on global extrapolations and estimations of adaptation costs, developing countries will be better served by country-level methodologies and tools that are context specific and allow for adaptation practices to be linked to national sustainable development goals and benefits. Developing countries urgently need country-specific tools and methodologies for estimating adaptation practices that are relevant and responsive to specific needs and conditions. They need access to relevant technologies and policy mechanisms to enable implementing and sharing best practices. Vulnerable countries also urgently need access to reliable forecasting mechanisms and tools for climate change risk management to enable them to protect low-lying coastal communities.

The lack of adequate financing focused on addressing the policy and programmatic nexus between global climate change and sustainable development objectives has — and will continue to have — profound implications for developing countries' engagement with global climate change, and for achieving national sustainable development goals including poverty reduction. In light of the 2015 deadline for attaining the MDGs, the inequitable and disproportional impacts of climate change on the world's poor and vulnerable communities should be the immediate frame of reference guiding the development of post-2012 adaptation.

Despite the creation of intergovernmental efforts for financing adaptation, the national delivery of services, resources and tools has remained fragmented and ad hoc. Sustained global efforts to integrate adaptation with sustainable development should therefore focus on:

- Scaled-up financing for national delivery of services aimed at costing and implementing relevant country driven adaptation practices.
- Scaled-up support for comprehensive national actions that link the policy and programmatic nexus between climate change adaptation and broader national sustainable development goals with a view to building resilience and reducing vulnerabilities amongst poor and vulnerable communities.

The global community should commit to building and strengthening technical, policy and institutional capacity and to ensuring increased access to existing and new sources of finance for implementing country driven adaptation practices explicitly linked to sustainable development objectives — including adopting measures closely integrated with national action to reduce poverty, improve human health and food security, promote sustainable energy services, and address biodiversity loss and desertification. UNEP

tuning the instru

The Clean Development Mechanism (CDM) has been vital in implementing the Kyoto Protocol. Its achievements are remarkable - particularly since the climate regime had no market experience just five years ago. The Protocol's market mechanisms are the United Nations' first attempt to create and regulate a global commodity.

But the Protocol was never intended as the solution to climate change, nor were its market mechanisms seen as final products. The Protocol is limited in its global emission reduction target, in its timeframe, and in the countries that participate. Given the scale of the climate challenge, it can only be a preamble to an extended and enhanced effort — continuing to rely heavily on market mechanisms which may have to evolve to leverage the necessary capital and technology transfer. The Stern Review estimates that $20-30 billion per year must be invested to cover the incremental costs of decarbonisation. The annual deployment of capital through primary CDM transactions doubled from $2.4 billion to $4.8 billion between 2005 and 2006, and is doubling again in 2007. But this is still only a fraction of what is needed. The CDM can, and must, do better.

For industrialized countries the CDM's purpose is to cut enough emissions to lower the cost of their reduction commitments under the Protocol. The CDM has registered over 900 projects with a potential of delivering up to 1 billion tonnes of CO2 by the end of 2012. At least another 1800 projects — which could deliver another 1.5 billion tonnes by then — are in the pipeline.

For developing countries, the CDM has two purposes: to promote domestic sustainable development and to help stabilize global greenhouse gas concentrations in the atmosphere. These goals require it to be an effective instrument for decarbonising developing countries' trajectories of production and consumption. Here it has not performed quite so well.

It started by concentrating on projects to eliminate industrial gases with high global warming potential and extremely low elimination costs — particularly HFC-23 and N2O. This was the obvious place to start: without the CDM, there would be no incentive for eliminating them. The projects allowed the CDM to generate early reductions, build market confidence, and lower the initial cost

ument by Christiana Figueres

of the supply of certified emission reductions — but continuing them beyond 2012 is highly questionable.

The CDM has also shown that it can catalyze the uptake of commercially proven technologies to capture waste heat and gases, thus increasing efficiency and reducing the local environmental impact of major carbon intensive industries like iron and steel, cement, and chemicals. It has also begun to support methane capture and use and efficiency in coal mining, oil and gas exploration and distribution.

Yet the CDM has fallen short of realizing its full potential. To date it has not:

- Demonstrated how project-based emissions reductions can catalyze and support decarbonising transport and the built environment — which comprise more than half of global carbon emissions and are the fastest growing sources in emerging markets;
- Shown the potential of creating carbon sinks through reforestation, leaving a huge imbalance in global efforts to manage climate change;
- Supported sustainable livelihoods and catalyzed energy access for the rural and peri-urban poor, leaving Sub-Saharan Africa and the least developed countries without access to carbon finance;
- Treated urban waste methane avoidance with sufficient regulatory consistency to promote a sustainable solution to the burgeoning waste management problem;
- Appropriately addressed coal fired power plants, the largest source of greenhouse gas emissions; nor
- Played an important role in switching from high to low carbon intensive fossil fuels.

These weaknesses are largely due to the CDM's creation as a project-based instrument. Restricting it to reducing emissions from single point sources has curtailed its potential to promote necessary sector-wide transformation, through cost effectively channelling capital and know-how to decarbonise such carbon intensive sectors as energy, transport and infrastructure.

The most important innovation for the 2008-2012 period is the introduction of "programmes of activities", achieving emission reductions by many actions resulting from a government measure or a private sector initiative. Instead of being restricted to a single facility, like traditional projects, these promote decarbonization of a whole sector or sub sector — and could provide a first opening toward policy-based and sector-wide emission reductions in developing countries. They are complementary to CDM projects in the structure of the market, and provide an incentive for developing country governments to adopt and implement climate friendly policies and measures, helping to prepare them for broader participation in the future climate regime.

The CDM's governance also needs urgent attention. Fundamentally important is a well-established and effective support structure, providing institutional memory, impartial substantive analysis and regulatory consistency. The CDM's institutionalization has gradually matured, slowly but surely shifting analytical work from its Executive Board to a growing technical Secretariat, thereby increasing its institutional knowledge capacity. It is now critical, if currently politically less acceptable, to professionalize the Executive Board. It is unreasonable to expect a part-time voluntary body with rotating membership, defined more by politics than business experience, to operate a market worth tens of billions of dollars a year.

Other specific measures deserve close attention for after 2012.

- Eliminating industrial gases as an eligible asset class. Continued eligibility for industrial gases would exacerbate existing biases in carbon finance flows to middle income industrializing countries and divert capital away from decarbonising their energy supply and infrastructure. With the bulk of industrial gases now eliminated, developing countries should require elimination of the rest as a production standard. The OECD should consider a grant program for poorer countries to ensure that they can install required catalysts and incineration equipment.
- Creating a level playing field for forestry activities. The full range of forestry interventions to create biological sinks should be included in post-2012 climate change management regimes, a process which has been started by the recent Bali decision on avoided deforestation.
- Sectoral Crediting. Programmatic CDM lets developing countries develop the capacity to organize and submit policy-based, sector-wide reductions from transforming production and consumption patterns. In the medium term, the larger rapidly developing countries could graduate into sectoral crediting mechanisms, defining clear-cut "domestic interest" reference lines, and being rewarded for capturing additional reductions in the "global interest" over a defined period. Reference lines would be progressive, embodying Governmental commitment to reduce the carbon intensity of growth while achieving domestic economic efficiency targets. Some form of sectoral crediting will be essential for mobilizing the level of private investment needed to transform economies the size of India and China as they grow at 6-8 percent a year — and for underwriting refurbishment of the slower growing industrial economies' existing carbon-intensive capital stock.

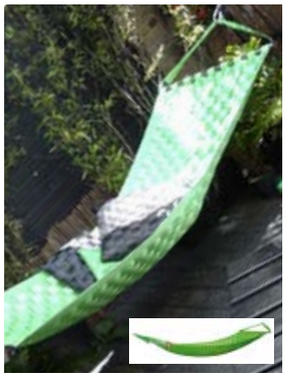
Several challenges will have to be met. First is the obvious disincentive against voluntarily setting such national interest sectoral reference levels: carbon intensive references that maximize potential crediting from the mechanism are preferred. Second, it implies differentiation in the Group of 77 and China — key for the regime's evolution, but extremely difficult politically, given the Group's long tradition and deeply entrenched negotiating position. Third, and most importantly, the feasibility of exponential supply in the market mechanism is predicated on commensurate growth in demand, stemming from much deeper reduction commitments by developed countries.

Managing climate change through the marketplace requires never-ending refinement and adjustment. It must be supported by keen observation and analysis, and quick — yet thoughtful — policy and regulatory adjustment, as we understand what works and what doesn't. The Kyoto Protocol has made an extraordinary and richly insightful contribution to our understanding of how to finance decarbonization and climate change resilience through market mechanisms. Governments must now identify the areas which need further improvement and swift action. The enormity of the challenge indicates that the market will continue to play an important role in climate control — but it will be effective only in as much as governments can make timely improvements.

This article summarizes work co-authored with Ken Newcombe.

products

A second life for seatbelts



Who said seatbelts cannot be recycled? Innovative sustainable design company Ting has created a hammock made entirely of rejected seatbelts which did not make the cut because they are slightly off-shade or failed their 2.5 tonne break test. The hammocks can hold two people and come in three colours — including green (the seatbelts originally intended for ambulances) and orange (designed for Easyjet airplanes). Ting also makes luggage, belts and wallets from 'salvaged materials'.

http://www.tinglondon.com/

Oilseed press

The manually operated 'Mafuta Mali' oilseed press has become the most popular cooking oil press for sunflower and sesame seeds in eastern and central Africa. It is produced by Kickstart, an NGO that develops cheap new technologies to help people create small businesses and climb out of poverty. The press extracts oil from sunflower, sesame, and other oil seeds. The filter then produces clear, cold-pressed, nutritious cooking oil ready for sale or consumption. Kickstart has sold more than 1,000 presses to date, helping to create over 700 oilseed pressing businesses — and over 1,500 new jobs in the sector — in Africa.

www.kickstart.org

Green Plug

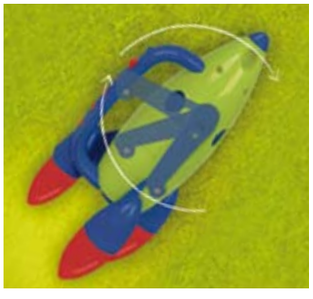
A huge amount of energy is wasted every day because people do not switch off their chargers after charging their mobile phone, laptops and other electronic gadgets. Even when a mobile is unplugged, the charger will continue to consume energy if it is left plugged in, resulting in substantial energy waste. This could change thanks to the Green Plug, a clever new device which switches itself off when no more charge is needed. In an ingenious twist, one Green Plug can charge up various devices, from laptops and printers to MP3 players and power tools. This means you can still charge up your laptop, MP3 player, etc even if you lose the charger for one of the devices. The producers of the plug say that in 2008 alone, 434 million external power supplies will be retired in the U.S. and only 12.6 per cent of them will be recycled, resulting in 379 million external power supplies going into U.S. landfills. The Green Plug could be part of the solution.

www.greenplug.us

Battery-free toys

The world now has the first electronic toys that require no batteries. The toys, known as Ecotronic Toys, are designed using dynamo science — which means they need to be moved around in order to work, adding to the fun and exploration for the child. The first toys in the range include a boys' classic rocket, a microphone, a pull-along duck and a wind-up radio. As well as cutting down on the need for polluting batteries, the toys come in green packaging made from biodegradable paper pulp — the material that egg boxes are made of. Like an egg box, the shape of the package perfectly mirrors the toy within, holding it snug and secure without the need for any plastic or tapes.

www.ecotronictoys.com/



Environment-friendly mobiles

Finnish mobile telephony giant Nokia has introduced its greenest mobile phone yet — the Nokia 3100 Evolve. The phone's covers are made from more than 50 per cent renewable material, and it comes in a small package made up of 60 per cent recycled content. Significantly, the phone also comes with a charger which Nokia says uses 94 per cent less energy than Energy Star requirements

www.nokia.com

Multitasking bicycle

The 'Aquaduct' is a bicycle for the developing world which transports and purifies water as it goes along. This innovative prototype beat 101 other entries to win Google's 'Innovate or Die Pedal-Powered Machine' contest — a competition to encourage people to come up with innovative, pedal-powered environmental solutions. The winning entry is designed to provide rural communities with access to clean water. This unique and functional bike transports, filters and stores water as it is pedalled — making it perfectly suited to people in the developing world who need to walk for several kilometres to fetch unfiltered water. The rider can even filter water while stationary thanks to a clutch which disengages the drive belt from the pedal crank.

www.innovate-or-die.com

Plug-in hybrid cars

The majority of the world's automobile commutes are relatively short: in the US, 78 per cent of commuters drive 40 miles or less to and from work. The car of the future, designed especially to do these daily trips with very little fuel, could be just around the corner. Car makers are scrambling to roll out their new prototypes of 'plug-in hybrid electric vehicles' — hybrid vehicles with batteries that can be recharged by connecting a plug to an electric power source. The real novelty is that while they have a combustion engine like ordinary hybrids, they are designed primarily to run on battery power alone for daily commuting — with the ability to run for around 60 km or more on battery alone before switching to their gasoline engines. These new types of hybrids could revolutionize our relationship to fossil fuels and reduce air pollution and greenhouse gas emissions. They are not yet in production, but Toyota, General Motors, Ford and Chrysler, as well as a few small start-up companies, have all announced their intention to introduce them in the next few years. GM's Chevrolet Volt and Toyota's plug-in Prius — expected to be the first of their kind in regular production — could hit the road by late 2010. The race is on.

www.chevrolet.com/electriccar/

Sustainable Apple

Greenpeace has applauded Apple's new laptop, the MacBook Air, lauding Apple's focus on making it an environmentally-friendly PC. The new machine is mercury and arsenic free. Apple has phased out toxic chemicals Brominated Fire Retardants (BFRs) and Polyvinyl Chloride (PVC), making the machine its greenest-yet computer. This, according to Greenpeace, will raise the bar for the rest of the IT industry.

www.apple.com

© Adeel Halim/Reuters

He is Bollywood's biggest star, and he has vigorously taken up the cause of climate change which, he is convinced, "threatens our world". Amitabh Bachchan — veteran of more than 140 films and winner of fifteen major awards — is cutting his own carbon footprint and aims to persuade hundreds of millions of fans to do the same. And he has enlisted fellow stars in the campaign, including his own son and daughter-in-law who join him in making up the 'first family' of Indian cinema.

The 'Big B' , as aficionados call him, says global warming is "a deeply grave phenomenon that can no longer be ignored" and has set out to bring it "to the forefront of people's minds", particularly in India. And he is determined make Bollywood "a powerful vehicle by which to rally public consciousness."

Last year, at his initiative, the Indian cinema's 'Oscars' — the International Indian Film Academy (IIFA) Awards — took on a green theme. Some 450 million people around the world watched as he and other stars took the stage to stress the need for action.

They were accompanied by a specially commissioned film starring the then British Prime Minister, Tony Blair, as well as Bachchan and fellow Bollywood legend Shekhar Kapoor — and Hollywood actresses Heather Graham and Sienna Miller. The film was put together by Global Cool, a charity which aims to persuade a billion people worldwide to reduce their carbon dioxide emissions by an average of a tonne a year for the next ten years.

The ceremony — held in England, the country with the second largest Bollywood audience — also launched the "IIFA Bond for Global Cool'' through which fans pledge to save a tonne of C02. And the IIFA has drawn up plans to make all its future events carbon neutral, embracing a whole range of environmental standards.

Bachchan, a science graduate himself, says: "We aim to carry this message to a constituency of people who may otherwise be unaware of the serious impact of global warming. The smallest and simplest of changes will contribute to deferring the climate tipping point." Asked for examples, he replied: "Switch off the lights when not using them, don't charge your mobile for too long, and never leave the television on standby".

He has made some changes himself, installing energy-efficient light bulbs in his homes, and switching his flat in London over to electricity from renewable sources. He has cut down his travel and taken to shopping locally rather than driving to supermarkets. And he and his fellow Bollywood stars travelled up to the IIFA ceremony, in the Yorkshire town of Harrogate, by public train. His next initiative is to travel to 18 countries on all six continents with other Bollywood superstars — including son Abhishek and new daughter in law, the former Aishwarya Rai. Dubbed "The Unforgettable Tour" it will combine performances with raising awareness about climate change.

"It is about India and its high profile and hugely popular film industry focussing attention on climate change", he says. "India is becoming very prominent as far as global warming is concerned. It is a vastly and rapidly developing economy."

He cites the authoritative verdict that the world has only got eight years to start taking radical action, but adds "I believe that we can all make a difference by doing our bit"

Amitabh Bachchan

www.unep.org/ourplanet