



30 WAYS IN 30 DAYS

UNEP: inspiring action on climate change
and sustainable development



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To show which area of UNEP's priority climate change work each story falls under, please see the key below, and the fuller descriptions on page 64.

- Resilience to a changing climate
- ▲ Low carbon growth
- REDD
- ◆ Understanding and awareness of climate science

"...turning small climate keys to unlock very big doors."

Christiana Figueres, UNFCCC Executive Secretary



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PO Box 30552, Nairobi, Kenya
Tel: (254 20) 762 1234
Fax: (254 20) 762 3927
e-mail: unepubb@unep.org

To view this publication online, please visit
www.unep.org/unite/30ways

Director: Satinder Bindra

Editors: Susanne Morrell, Stuart Roberts

Coordinator: Fanina Kodre-Alexander

Special Contributors: Kaveh Zahedi, Joanna Benn, Moira O'Brien-Malone, Tamiza Khalid

Distribution Manager: Manyahlesha Kebede

Design: Amos Muema

Produced by: UNEP Division of Communications and Public Information

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Achim Steiner

UN Under-Secretary General
and UNEP Executive Director

Foreword

Extreme weather events dominated the headlines of 2010 and if the first part of 2011 is anything to go by, with some of the worst floods in decades in Brazil and Australia, we will continue to suffer the consequences of more frequent and extreme weather events – a pattern also consistent with the assessments of the Intergovernmental Panel on Climate

Change, hosted by UNEP and the World Meteorological Organization.

As the UN Environment Programme and climate modelers made clear in the run-up to the UNFCCC Cancún meeting in December, a significant emissions gap exists between what is promised by countries and what is needed to keep the rise in global temperature below two degrees Celsius, let alone move towards the more ambitious 1.5 degree threshold needed to protect low-lying island states.

Although the last two years have been a roller coaster ride in respect of securing a new global treaty to combat climate change, the latest round of climate negotiations held in December in Cancún, Mexico, put the world's efforts on climate change back on track – albeit at a pace and scale that undoubtedly left many onlookers frustrated.

However, the imperative for action grows daily. The emissions gap – which under the most optimistic scenario, amounts to the combined emissions of the entire world's cars, buses, and trucks – remains firmly in place. No one should underestimate the challenge now facing South Africa, the host of this year's talks, in terms of a new legally binding agreement to bridge this gap and secure the finance needed to bring a Green Fund into operation.

Notably, alongside the formal discussions in Cancún, progressive heads of state, regional and local government, business, and civil society in parallel underscored just how far and how fast some sectors of society are making the transition to a low-carbon future and building the green, clean-tech economies of the twenty-first century.

Similarly, UNEP's 30 Ways in 30 Days show that across the world, in a myriad of ways, from community based programmes to entrepreneurial endeavours, solutions are available to move countries, communities and businesses towards low-emission, climate resilient growth.

Every country and many institutions have their own 30 success stories. These solutions deliver multiple benefits, from access to energy, public health improvements, reduced environmental impacts to driving a transition to low-carbon, greener growth.

This momentum needs to continue to grow, reinforcing a new global treaty that not only brings certainty to carbon markets and triggers accelerated investments in clean-tech industries, but also ensures that more vulnerable countries are not marginalised. The challenge we face this year is to unite these goals.

▲ Solar loans for rural homes

Indian solar loan programme

"Solar lights are a long cherished dream of rural folk who often have no power, or only power supplies that are at best irregular. They are one product that can meet aspirations of people living below the poverty line. It is a good business opportunity for the bank."

Mr P G Ramesh, Chairman,
Pragathi Grameen Bank, Bellary,
Karnataka, India



THE PROBLEM:

More than 60 per cent of Indian households lack access to reliable electricity supplies and depend on kerosene for light and on burning dung and wood for heat. Solar power is an obvious alternative in a sunny country such as India, but high initial costs put it beyond the reach of most households, and lack of access to credit means the technology has been the preserve of only the wealthiest. Millions of urban and rural poor have been condemned to the risk of respiratory disease that results from solid fuel burning. Lack of electricity is also a powerful barrier to economic and social development.

THE SOLUTION:

In 2003 UNEP's Indian Solar Loan Programme worked with two of India's largest banking groups in two southern states, to start the lending market for household photovoltaic systems. The programme provided technical support and training, as well as an interest rate subsidy that allowed the banks to soften the cost of loan financing. While the banks did not profit directly from these subsidies, the project helped them become first movers in a new market for rural financing which saw almost 20,000 solar home systems financed between 2004 and 2007. Subsidies were gradually phased out to align with other banks entering the market lending on commercial terms. Consumer credit realized latent

demand, with over 50 per cent of rural sales in the two states credit-financed by the end of 2007, accelerating market penetration of solar lights in Southern India and inspiring several similar initiatives in India and elsewhere. In 2008 the programme won the Energy Globe Award, and in 2009 the Secretary General's UN 21 Award.

WHAT UNEP DID:

UNEP and the UNEP Risoe Centre's work with Canara and Syndicate banks and their rural Grameen affiliates proved it was possible to help the rural poor to access clean and affordable energy. By harnessing free market forces, the programme created a model for similar schemes elsewhere in the developing world.

THE BIG PICTURE:

The programme was the first at UNEP to show that obstacles to bank engagement in clean energy can have more to do with soft market development barriers and perceptions than underlying economics. Banks in many developing countries have sufficient capital to begin lending but the relative newness of renewable energy technologies, together with inconsistencies in the quality of the products and services offered by different vendors, can make lending difficult. In these situations the development community needs to shift away from traditional credit line approaches and instead focus on more subtle incentive

programmes that help banks set up their first loan portfolios and gain experience with the clean energy sector. This approach is also cost effective – for instance the \$900,000 in interest subsidies that UNEP put into the Indian programme generated \$6.7 million in commercial financing for solar home systems. Are these sorts of programmes enough to change the finance sector's view of clean energy? UNEP's experience has been that once banks write around 10,000 loans for clean energy technology, they begin to see the sector as fully viable commercially and will generally work on their own to develop it further. Getting past this 10,000 threshold could help accelerate renewable energy uptake in many countries.

www.unep.org/unite/30ways
www.uneptie.org/energy/activities/islp
www.uneprisoe.org



▲ ◆ Holidays for a living planet

The Green Passport campaign

*"It seems to me we all look at nature too
much and live with her too little."*

Oscar Wilde



THE PROBLEM:

We go on holidays for pleasure, to discover new horizons, to relax, to meet people and to learn about different cultures. But it's easy to forget about the impact of our holiday on our destination or the planet. Yet tourism accounts for 5 per cent of global CO₂ emissions, and projections show that if we take no action now, emissions could triple by 2035. There is tremendous variation across tourism segments and within individual trips. For instance, long haul travel accounts for just 2.7 per cent of all tourist trips, but contributes 17 per cent to global tourism emissions; and while 34 per cent of all trips are made by coach and rail, these make up just 13 per cent of emissions. Technological innovation (particularly in energy efficiency) has considerable potential to reduce tourism's environmental impact, but will not be enough to achieve absolute reductions in energy use and emissions. Both structural change (by the industry) and behavioural change (by tourists) will be necessary.

THE SOLUTION:

The Green Passport Campaign – an initiative of the UNEP-hosted International Task Force on Sustainable Tourism Development – aims to introduce travellers to some of the things they can do to make tourism sustainable. Through travel guides, websites and other

activities, the campaign helps tourists minimize their footprint by choosing the least polluting form of transport, finding low-impact accommodation options, improving their energy efficiency at destinations, offsetting the inevitable carbon emissions of their trip, and acting to help improve livelihoods in host communities. National Green Passport campaigns are in place in Brazil, Ecuador and South Africa (where 100,000 Green Passports were distributed to visitors during the 2010 FIFA World Cup); and campaigns are about to begin in Costa Rica and Israel. Brazil's campaign has been so successful that it was recently recognized as one of the country's most prominent advertising campaigns.

WHAT UNEP DID:

UNEP produces Green Passport travel guides in English, Portuguese and Spanish, and hosts and updates the UNEP Green Passport website that helps travellers make sustainable choices, providing information in Chinese, English, French, German and Greek. UNEP hosts the International Task Force on Sustainable Tourism Development, which aims to unlock the positive power of demand through raising tourists' awareness of their potential to contribute to sustainable development by making responsible holiday choices. The task force, led by the French Government, has implemented more than 40 projects and agreed on policy recommendations for mainstreaming sustainable tourism. It is now

being transformed into a more permanent entity – the Global Partnership for Sustainable Tourism – which has 19 country and 21 organization members.

THE BIG PICTURE:

Tourism is one of the world's largest industries, generating close to 11 per cent of global GDP and about eight per cent of jobs worldwide. In some developing countries tourism brings in up to 10 per cent of foreign exchange. Sustainable tourism has significant potential to alleviate poverty and help countries move to the green economy that will be essential if we are to avert irreversible climate change. Paraty, a city in the Brazilian state of Rio de Janeiro, is implementing Green Passport principles on a pilot basis. Brazil's Environment, Tourism, and Education ministries, in partnership with a committee of community leaders, local politicians and tourism representatives, are working to improve Paraty's sustainability as a destination by promoting capacity-building in the tourism industry, undertaking environmental education and community-based initiatives, certifying hotels, and developing waste reduction schemes. This work recently paid off when Paraty became listed as a World Heritage Site.

www.unep.org/unite/30ways
www.unep.fr/greenpassport





▲ The power of a cup of tea

Greening the tea industry in East Africa

"Tea is known to be good for you, now it is also getting better for the environment."

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



THE PROBLEM:

Tea in East Africa provides jobs and livelihoods, but it also uses a lot of energy. The tea sector employs around one million people and indirectly supports approximately four million. Burundi, Kenya, Malawi, Rwanda, Tanzania, Uganda and Zimbabwe together produce 28 per cent of the world's tea. But tea is energy intensive: it takes 8 kWh of energy to process one kilogram of finished tea, compared with only 6.3 kWh for the same amount of processed steel. In parts of East Africa, power is not only expensive, but also unreliable, and power fluctuations can have serious consequences, so many tea factories have been forced to install standby diesel generators to meet their needs.

THE SOLUTION:

The tea estates' high altitude locations – in areas with high annual rainfall and all-season river flows – make them ideal sites for hydropower projects. With the support of the Greening the Tea Industry project, feasibility studies for eight sites have been completed, and up to six small hydropower stations will be built as demonstration projects. Any surplus hydropower will be used to provide electricity for nearby villages that have no grid connection.

Over a period of 20 years, this project is expected to invest in 82 MW of small hydropower plants, as well as benefit more than a million tea farmers, their households, communities and associated enterprises.

WHAT UNEP DID:

Using \$2.8 million from the Global Environment Facility, UNEP is providing technical support for the development of environmentally friendly business solutions. Pre-feasibility studies for 19 projects in Kenya, Malawi, Rwanda, Tanzania and Uganda identified a need for additional investment of close to \$22 million to implement six demonstration projects. Supported by local banks and UNEP funds, hydro electricity plants are being developed in key tea areas of Kenya, while the Dutch Government is helping finance a facility in Rwanda. Plans are being finalized for more plants in Tanzania and Malawi. UNEP also supported preparation of feed-in tariff policies for renewable energies in Kenya and Tanzania. Under these policies, national grid utilities are obliged to buy renewable energy from all eligible participants and to promote investment in hydropower.

THE BIG PICTURE:

Around 1.6 billion people lack access to modern energy, and huge capital investments will be required in the coming decades to meet the world's increasing energy demands. UNEP is working to ensure that these investments are made in an environmentally friendly way. Although renewable energies can meet the world's present and projected demands, too often mainstream financiers still consider them a niche technology, which poses a significant challenge to scaling up financing to this sector. UNEP is working to change that.

www.unep.org/unite/30ways
<http://greeningtea.unep.org>





▲ Banking on Africa's green economy

The African Carbon Asset Development Facility (ACAD)

"ACAD's training seminar was an eye opener for the immense opportunity that carbon financing presents to development financiers."

Abraham Muthogo Kamau, Head of Credit at Industrial & Commercial Development Corporation (ICDC) Kenya



THE PROBLEM:

About \$84 billion was invested through the Clean Development Mechanism in 684 emerging market emission reduction projects worldwide in 2009, but Africa took only two per cent of the total. A combination of perceived better returns in markets such as China and India, together with disproportionate concerns about corruption and political unrest, has kept Africa lagging behind in global carbon markets. Additionally, the unfamiliarity of foreign investors and African banks with this market, and a lack of risk capital, has held the financial sector back from bankrolling good projects. But green energy infrastructure projects and businesses can deliver the new livelihoods that Africa badly needs. The burgeoning carbon market offers a real opportunity for development: the challenge is how to get good projects off the ground.

THE SOLUTION:

As a continent of developing economies, Africa has an unparalleled opportunity to build prosperity on green and sustainable foundations, avoiding many of the mistakes that more developed countries have made. Helping African financial institutions to understand carbon finance can overcome

their risk aversion. Through a package of mechanisms that includes transaction cost sharing, technical assistance to project developers, and training of financial institution staff, the African Carbon Asset Development Facility (ACAD) aims to kickstart the African carbon market.

WHAT UNEP DID:

In 2009 UNEP launched ACAD – a financing platform that aims to help African banks and eco-entrepreneurs unlock the potential of the continent’s nascent green economy. It provides education and seed funding for replicable projects that demonstrate innovative, locally appropriate market solutions to low-carbon growth and development. ACAD’s partnership approach is based on experience gained through previous programmes designed to improve carbon investment capacity in sub-Saharan Africa. The ACAD Facility is a public-private partnership supported by funding from the German Federal Ministry of Environment within the framework of the International Climate Initiative.

THE BIG PICTURE:

About \$750,000 has been used as seed finance in 2010, with an average grant per project of \$60,000. More than 150 participants from financial institutions

across Africa have taken part in ACAD’s training events, while more regional investor outreach and mobilization activities are planned. ACAD already supports 11 innovative projects that will save around Five million tonnes of carbon emissions over 20 years. One such project is the pedal-powered rechargeable LED lights produced by Nuru Designs. The lights are transforming life in rural Rwanda – by enabling children to study, home-based businesses to operate, and households to function after dark – as well as reducing emissions. ACAD’s training seminars and toolkits can be scaled to be appropriate to any institution, and the projects it supports are expected to be replicated across the continent.

www.unep.org/unite/30ways

www.acadfacility.org

www.unep.tie.org/energy/activities/acad/index.htm





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■ Native trees are the bee's knees

ClearSky Climate Solutions' native species reforestation project in Panama

"ClearSky's model of forestry in Panama works for local communities, wildlife, watersheds, investors, and the atmosphere."

Stephen Handler, ClearSky Climate Solutions



THE PROBLEM:

For decades, Panama's native forests have been cleared by commercial timber harvesting and subsistence farming. This land is generally cultivated for a few years and then sold to local cattle ranchers and the pattern repeated elsewhere. Cattle ranching causes soil compaction and erosion, and prevents natural vegetation regrowth. This contributes to decreasing soil productivity and soil regeneration capacity, in turn limiting future land use options. This destructive cycle has led to widespread soil degradation and deforestation.

THE SOLUTION:

The barren wasteland left by ranching cannot reforest itself because of poor soil condition and sparse surrounding vegetation. Into this unpromising scenario steps ClearSky Climate Solutions with the Panama Native Species Reforestation Project, which converts low-productivity grasslands into diverse multi-species forest plantations to rehabilitate ecosystems, protect habitat and produce timber, leading directly to a reduction in carbon emissions. The sale of carbon credits generates income, resulting in sustainable and complex plantation ecosystems that contain multiple species, have multiple uses, and produce a diverse

stream of products and benefits. Working with partner Futuro Forestal, the project has purchased abandoned grasslands at two sites on Panama's Pacific coast and planted them with a mix of 50 endangered non-commercial native species and teak, helping to restock vulnerable tree species and provide diverse habitats for local fauna and flora. As of 2010, the project has sequestered 140,000 tonnes of CO₂.

WHAT UNEP DID:

UNEP set up the Climate Neutral Network in 2008, an internet based forum for the exchange of strategies and initiatives to reduce carbon footprint, share knowledge, create opportunities for technology transfer, and promote the global transition to low-carbon societies. ClearSky joined in January 2010, and the extensive international reach of the Climate Neutral Network has given ClearSky the opportunity to engage with other businesses and organizations that are interested in becoming climate neutral while increasing global exposure of this project's benefits.

THE BIG PICTURE:

Cattle ranching remains an important part of Panama's economy but large ranchers are intensifying and mechanizing production, thus reducing pressure on land. This will

make more land available for potential native species reforestation, and provide scope for replicating the project elsewhere in the country and in wider Central America. The scheme's integrated planting system helps create diverse habitats for ocelots, spider monkeys, hanging colonies of weaver birds, threatened mangroves and orchids, and connects patches of secondary forest. Recent biodiversity assessments in the project area revealed several species from the 2007 IUCN Red List. The project is already the area's biggest employer and offers employment benefits to some of the most marginalized of Panama's rural population. Additionally, workers receive training in literacy, computing skills, field monitoring, fire control, irrigation, nursery techniques, integrated pest management and other forestry techniques.

www.unep.org/unite/30ways
www.clearskyclimatesolutions.com
www.unep.org/climateneutral





Cooking away climate change

From Haiti to Nigeria, improved stoves help development and fight climate change

"I am happy to have a better stove that helps me save money on my charcoal costs as well as helping my country's environment. We need more improved stoves in our markets at good prices. Please continue helping Haiti."

Haitian woman in Camp Issa Tabar, Port-au-Prince, who uses an improved charcoal stove

THE PROBLEM:

Apart from contributing to deforestation, it is estimated that inefficient stoves are responsible for close to 25 per cent of emissions of black carbon – particles more commonly known as soot. According to research carried out by the UNEP-supported Atmospheric Brown Cloud project, black carbon could be a significant factor in the climate change currently being experienced. Like other small island nations, Haiti is highly vulnerable to the adverse effects of climate change, a vulnerability made more acute by the almost total loss of forest caused largely by demand for wood for cooking and construction. Forest resources in Nigeria are similarly under pressure, with the Guinea Savannah Zone of the country suffering from extensive deforestation and desertification. Buying and collecting wood puts a strain on households and on forest resources, threatening ecosystems and biodiversity, contributing to climate change, and increasing communities' vulnerability to flooding and landslide caused by soil erosion.

THE SOLUTION:

Promoting a switch to more efficient stoves is an important part of efforts to address the environmental and climate impacts of severe deforestation. By reducing the amount of charcoal that households and businesses need, pressure is taken off forest resources. This is particularly crucial in a country like Haiti, where UNEP is working to ensure

there is adequate, long term investment in natural resource management and clean energy, as the country rebuilds in the wake of natural catastrophes. Similarly, the Nigerian Developmental Association for Renewable Energies is helping people in the Guinea Savannah Zone of Nigeria to save money by reducing the amount of wood they need for cooking by replacing their traditional fireplaces with efficient stoves. Demand for forest resources has fallen, conserving valuable biodiversity and ecosystem services, reducing CO₂ emissions from wood burning, and leaving trees standing to act as carbon sinks.

WHAT UNEP DID:

With support from the governments of Ireland and Norway, UNEP is working with the Haitian Government to identify opportunities for investment in clean energy. This includes more efficient biomass-fuelled cooking stoves, which provide multiple social, health and environmental benefits. A national strategy for improved stoves is under development. So too is a Haiti Improved Stoves Working Group – a low cost forum for coordinating and promoting improved stove initiatives. In Nigeria, the United Nations Framework Convention on Climate Change (UNFCCC), in partnership with the Nigerian Developmental Association for Renewable Energies, is helping inhabitants of the Guinea Savannah Zone replace their traditional fireplaces with efficient stoves. This

project is registered under the Kyoto Protocol's Clean Development Mechanism (CDM), under which projects can earn certified emission reduction credits by reducing greenhouse gas emissions.

THE BIG PICTURE:

UNEP's work is contributing to the international effort coordinated through the new Global Alliance for Clean Cookstoves, which aims to have 100 million households switch to clean cooking stoves by 2020. With UNEP among its founders, the alliance aims to improve livelihoods and combat climate change by creating a thriving global market for clean and efficient stoves. The Nigerian cookstoves project alone is expected to save more than 300,000 tonnes of carbon over its 10-year lifetime, and is likely to earn \$3.13 million in saleable certified emissions. There is huge potential for introducing affordable and efficient stoves in developing countries, matched by the availability of funding for this type of project under the CDM. Efficient wood fuel stoves, built locally, have also created employment and freed up people's time (especially for women), which can now be devoted instead to income generating activities. UNEP is also part of the International Network on Household Energy which focuses on solutions to issues surrounding firewood collection in humanitarian settings.

www.unep.org/unite/30ways
www.fuelnetwork.org





No place like home to walk the talk on climate change



Buildings and climate change – creating solutions

“The emission reduction potential in the building sector at an assumed carbon cost of US\$20 per tonne CO₂ equivalent is larger than the combined potential in industry, transport and forestry.” IPCC 4th assessment report, fig 4.2



THE PROBLEM:

Buildings are responsible for more than one third of global energy use and are – in most countries – the largest source of greenhouse gas emissions. Building related emissions were estimated at 8.6 billion tonnes in 2004 – a figure that could almost double by 2030 – yet available technologies could cut energy consumption in new and old buildings by between 30 and 50 per cent without significantly increasing investment costs. This technology is little used, owing to the fragmentation and relatively short investment perspectives that prevail in the building sector. The challenge is to mainstream sustainability and energy efficiency, encouraging a life cycle approach to building construction, design and refurbishment.

THE SOLUTION:

Smart design, improved insulation, low energy appliances, high efficiency ventilation and heating/cooling systems, and the behaviour of building users can have significant impacts, but systemic change demands more. Governments must establish a policy framework that rewards life cycle approaches to energy, water and resource efficiency in the building sector, supported by tools that allow the effect of sustainable building measures to be measured and verified. UNEP's Sustainable

Buildings and Climate Initiative (SBCI) is a platform for international cooperation to address the sustainable buildings agenda through policy advice, capacity building, R&D, and tools development. Believing that there's no place like home to 'walk the talk' on climate change, UNEP's new headquarters in Nairobi is designed to become energy neutral through the combined impacts of solar power generation, maximizing natural lighting and cooling, switching to the most efficient IT solutions and technology, and introducing a set of rules for office operations. Other sustainability features, such as rainwater harvesting, water recycling, state-of-the-art lighting and water treatment systems, improved waste management, and the use of environmentally friendly building materials, help make the building the first of its kind in Africa and an international showcase for sustainable buildings.

WHAT UNEP DID:

Working with a wide range of partners in the public and private sectors, as well as with sister UN organizations such as UN-Habitat and UNDP, UNEP's SBCI is developing a proposal for a common carbon metric, which will allow consistent and comparable reporting on the climate performance of any building anywhere in the world. To minimize the environmental impact of its own new building, UNEP has employed a range of green building

techniques, used local materials wherever possible, and ensured that its solar panels will generate, on average, as much electricity as the building and everyone working there consumes. Plans to create awareness among staff of the need for behavioural change, and regard for the environmental impact of their actions, are in place.

THE BIG PICTURE:

SBCI's work in aligning efforts that will enable policymakers and building sector stakeholders to apply life cycle approaches in all new and refurbished buildings worldwide has made a global impact. In developing countries alone, an investment of \$90 billion in energy efficient buildings is expected to generate savings of over \$600 billion in avoided energy costs. There is global potential for energy efficiency in buildings, and associated health, safety and economic benefits. An estimated 3.6 billion tonnes of greenhouse emissions can be avoided through energy efficiency measures in buildings by 2050 at net zero cost, and significantly greater savings at moderate cost.

www.unep.org/unite/30ways
www.unep.org/sbci





■ ◆ Life's a beach

Integrating marine ecosystems and climate change factors into risk and vulnerability assessments in Jamaica

"For the first time, we have a tool that enables government agencies to make more informed decisions about land use and development that accounts for the role of ecosystems, such as sea grasses, in reducing risk."

Dr Ronald Robinson, Minister of State,
Ministry of Foreign Affairs and Foreign Trade, Jamaica

THE PROBLEM:

Jamaica is vulnerable to tropical cyclones and rising sea levels, and its diverse ecosystems and rich biodiversity are under pressure from population growth and a strong international tourism industry. Tourism contributes around five per cent of Jamaica's GDP, but the country's main tourist asset – its beaches – are literally being washed away. Between 1968 and 2006 one of the island's main tourist beaches eroded by between 0.5m and 1m per year. Beach erosion is driven by multiple factors, including worsening storms in the region and sea level rise, as well as development activities and unsustainable livelihood activities such as overfishing, fishing with dynamite, and farming practices that result in chemical run-off to shorelines and reefs. These activities also have a negative impact on coastal ecosystems, particularly coral reefs, sea grasses and mangroves, which in turn exacerbates beach loss. Population growth and migration to high risk urban and coastal areas exposes more people to the risk of natural hazards, threatening life and livelihoods, particularly in small island developing states (SIDS) such as Jamaica, where coastal ecosystems directly or indirectly support much of the population.

THE SOLUTION:

Coral reefs and sea grasses play an important role in mitigating beach erosion, but their role is not well understood, and the services they provide are not valued. The Risk and Vulnerability Assessment Methodology Development Project (RiVAMP) uses evidence based spatial and statistical analysis to demonstrate the role of ecosystems in reducing disaster risk. This data supports policymakers in land use planning and in natural resources and disaster management, by providing them with the information they need to make decisions that support sustainable development through improved ecosystem management.

WHAT UNEP DID:

The RiVAMP methodology combines applied science, stakeholder consultations and interviews, optimizing data by complementing technical and quantitative analysis with local knowledge and experience. Working with the Planning Institute of Jamaica (PIOJ), the Institute of Sustainable Development at the University of the West Indies (UWI) and others, UNEP demonstrated that, although submarine slopes and wave intensity play a part, coral reefs and sea grasses are most important in mitigating beach erosion. Quantifying the role of ecosystems for shoreline protection in addition to their contribution to livelihoods provides a strong incentive to protect and restore them. Project partners have used the

RiVAMP results to advocate for improved protection and management of ecosystems, particularly along the coast.

THE BIG PICTURE:

With sea levels forecast to rise, and extreme weather events predicted to intensify, improving protection and management of ecosystems – particularly along the coast – is an important part of national strategy for sustainable development, disaster risk reduction and adaptation to climate change. Both the PIOJ and UWI are committed to applying the RiVAMP methodology in other parts of Jamaica and the wider Caribbean region. Because the RiVAMP approach is evidence based and works through multi-stakeholder consultations, its findings have a high level of local ownership and send clear messages to policymakers regarding the importance of sustainable ecosystem management in reducing vulnerability to disasters and climate change. UNEP plans to adapt the methodology to other ecosystems – such as mountains and highlands – that are also vulnerable to the impacts of climate change.

www.unep.org/unite/30ways
<http://postconflict.unep.ch/publications/RiVAMP.pdf>
www.grid.unep.ch/RiVAMP





◆ Breathing life into the Clean Development Mechanism

Capacity Development for Clean Development Mechanism (CD4CDM)

“Mozambique hadn’t ratified the Kyoto protocol when CD4CDM started and I can say with certainty that without the project, ratification would have been a much longer and more difficult process and we would not have the project portfolio we have now.”

Alberto Isamboi, Ministry of Environment, Government of Mozambique

THE PROBLEM:

The Kyoto Protocol's Clean Development Mechanism (CDM) was designed to help industrialized countries reduce the cost of complying with carbon emission targets and at the same time boost sustainable development in developing countries. But it soon became clear that many smaller developing countries needed help to benefit fully from new carbon market opportunities. Because they lack the institutional capacity to identify, analyse and implement projects under the specific rules of the CDM, poor countries risk missing out on huge earning and green development potential.

THE SOLUTION:

For developing countries to make the most of this opportunity, appropriate business and regulatory environments need to be created, and individuals must be equipped with the skills to design CDM projects. Since its inception in 2002, the CD4CDM (Capacity Development for the Clean Development Mechanism) has provided an extensive programme of training and knowledge support in the financial and other sectors, and has created 840 CDM projects in developing countries.

WHAT UNEP DID:

UNEP established the CD4CDM project with partners – including several regional energy and environment centres in developing countries – along with \$12.5 million funding from the Dutch Government. UNEP helped 19 countries to create Designated National Authorities, which are the bodies required to validate and register CDM projects. Some 5000 people were provided with skills and knowledge of the CDM project cycle, including CDM project appraisal and implementation. UNEP also set up the CDM Bazaar, a web based information sharing platform for buyers and sellers of Certified Emissions Reductions, and Regional Carbon Forums that bring together buyers and sellers in Africa, Latin American and the Caribbean. The regular African Bankers Forum ensures local financial institutions have a good understanding of the CDM. UNEP continues to build on the success of this project, with support from, among others, the EU, France, Denmark and Spain.

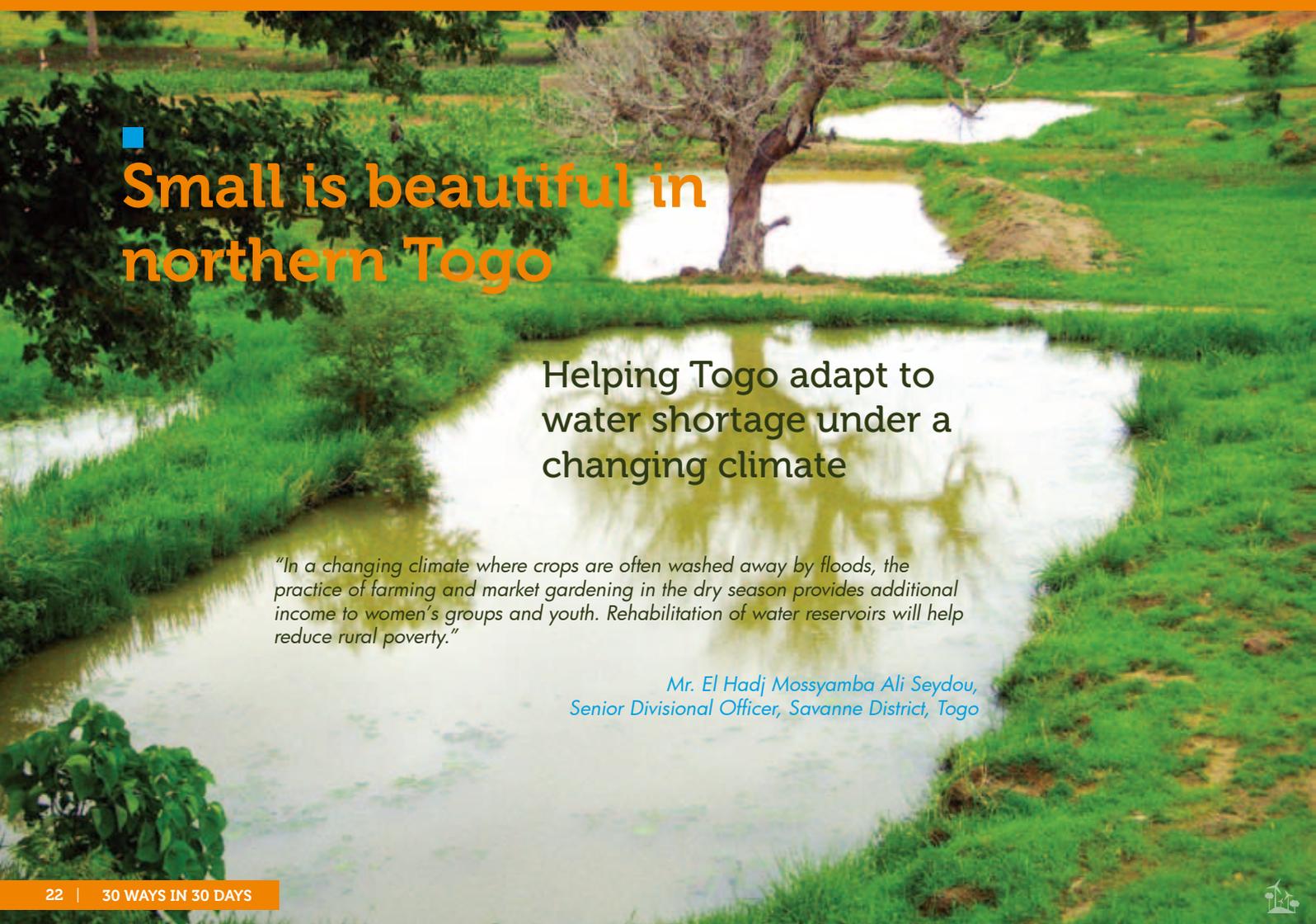
THE BIG PICTURE:

Egypt, Ivory Coast and Mozambique ratified the CDM during the life of the CD4CDM. The project was instrumental in the development of legal and regulatory

frameworks in Bolivia and elsewhere, and its knowledge tool – the CDM Pipeline – has grown into one of the main guides to carbon market development. CD4CDM's capacity building activities mean that 5000 people, including policymakers and funders, are now more aware of climate change and so are more likely to support national mitigation actions. The project has proved itself capable of replication in many countries and on many scales.

www.unep.org/unite/30ways
www.unepriaoe.org
www.CDMpipeline.org
www.cdmbazaar.org





■ Small is beautiful in northern Togo

Helping Togo adapt to water shortage under a changing climate

"In a changing climate where crops are often washed away by floods, the practice of farming and market gardening in the dry season provides additional income to women's groups and youth. Rehabilitation of water reservoirs will help reduce rural poverty."

*Mr. El Hadj Mossyamba Ali Seydou,
Senior Divisional Officer, Savanne District, Togo*

THE PROBLEM:

Togo is one of several countries with a northern region that borders the Sahara Desert, and the people of the north have for years used earth water reservoirs for their own use and to water their livestock in times of drought. But many of the dams in these poor, rural areas have fallen into disrepair and, with desert encroachment and accelerating climate change, are no longer adequate, threatening the health and development of the local population.

THE SOLUTION:

Small is often beautiful in terms of adapting to climate change. In July 2009 the Climate Change and Development – Adapting by Reducing Vulnerability (CC DARE) programme responded to a request from Togo’s Department of Village Water Supply for financial and technical support to help the authorities and communities of Savanne District in northern Togo improve their understanding of climate change adaptation, undertake the rehabilitation of selected water reservoirs, and then use the information and expertise gained to develop a proposal for the rehabilitation of all water reservoirs in Togo.

WHAT UNEP DID:

With funding of \$100,000, two dams were rehabilitated, involving excavation, enlargement, reinforcement and repair of dykes, pipe strengthening, and development of channels to feed fish ponds. Overall storage capacity was increased by more than 40 per cent, and the project yielded reliable economic data and concrete adaptation information that will guide future interventions. The joint UNEP and UNDP programme uses funding from the Government of Denmark to make big differences in developing countries that are on the climate front line. Working with the Togo Government, local authorities, community leaders, and the private sector, the project showed how small, flexible and targeted support can deliver significant change. This includes improving access to water for local communities, enhancing understanding of climate change and the planning and activities necessary to adapt to it, and providing valuable data for bigger interventions elsewhere in the country.

THE BIG PICTURE:

As a result of this rehabilitation project, local communities have an increased understanding of the role of plants and forests in conserving water and soil, and have been encouraged to landscape water points with appropriate vegetation cover to reduce evaporation and encourage biodiversity renewal. Togo’s Ministry of Water Resources has gained a tool to help manage water policy under a changing climate, supported by more informed communities and local authorities that understand the importance of small dam rehabilitation, and can see the impact of such interventions on people and their livelihoods. The data on costs extracted from the project will not only enable such schemes to be put into practice on small or large scales elsewhere in Togo and across Africa, but will also allow them to be implemented at a significantly reduced cost and with locally sourced materials.

www.unep.org/unite/30ways
www.ccdare.org





■ Daring to make the difference

Relocation and rehabilitation: climate change adaptation in Rwanda



“The success of the CC DARE programme in Rwanda is exemplary and will serve as a model for CC DARE cooperation in other countries.”

Danish Environment Ambassador, Ms. Margit Thomsen

THE PROBLEM:

Once home to populations of chimpanzees and Golden Monkeys, the sloping terrain of Rwanda’s Gishwati Forest has in recent decades suffered severe environmental degradation, which has been exacerbated by devastating climatic disasters. Landslides, floods and torrential rain have claimed lives, demolished human settlements, and destroyed thousands of hectares of forest and farmland. The 1994



genocide displaced many thousands of people, which led to further land clearing and extensive degradation as desperate people were forced to settle on steeply sloping land in this densely populated country.

THE SOLUTION:

The joint UNEP and UNDP Climate Change and Development – Adapting by Reducing Vulnerability (CC DARE) programme provided Rwanda with funding to develop a Land Suitability and Land Use Plan. This helped guide the relocation of human settlements from high risk zones, as well as the rehabilitation of vacated land, in order to reduce the vulnerability of local communities and ecosystems. Risk assessments showed that if further erosion of the Gishwati forest was to be avoided, 43 per cent of the terrain – around 2844 hectares – should be used for pasture, forest plantation and fruit trees. Of this land area, 1393 hectares should be preserved and invasive human activities forbidden.

WHAT UNEP DID:

CC DARE showed that small, flexible and targeted funding works. Working with the Rwandan Ministry of Environment, local government, districts and communities, and with \$150,000 in funding from the Danish Ministry of Foreign Affairs, UNEP provided timely and focused support for the

planning that is vital for moving communities and rehabilitating land. The project also developed manuals that enabled a proper assessment of land use – guiding communities and authorities on carbon sequestration, high value crops, soil resilience, sustainable farming systems, bridging periods of food insecurity, and strategies to cope with climate variability. The programme attracted national government interest and acted as a catalyst for larger interventions. The relocation of communities to safer areas was implemented by local government and supported by national budgetary allocation, demonstrating the partnership and devolution of power that can fast track the implementation of climate change adaptation while keeping actions within national development programmes.

THE BIG PICTURE:

The updated Land Suitability and Land Use Map and Plan for Gishwati has had an enormous impact, paving the way for innovative action on climate change adaptation in Africa's most densely populated country. The initial investment has enabled the Rwandan Ministry of Agriculture to access \$25 million from the Government of Rwanda for the resettlement of returnees displaced by the 1994 genocide, and for the rehabilitation of land where the risk of landslides and flooding is greatest. Rehabilitation will, in turn, enable Rwanda to play a bigger role in global carbon trading through the establishment of new carbon

sinks in Gishwati. The success of the project has helped Rwanda leverage other funds, including \$15.9 million from the UNFCCC Least Developed Country Fund and UNDP, among other sources, and enabled other climate change adaptation programmes in the country to make substantial savings. There is enormous potential for the project to be replicated elsewhere in Rwanda. There are plans to share the knowledge and experience the project has generated with other central African countries to encourage the approach on a small or large scale beyond Rwanda's borders.

www.unep.org/unite/30ways
www.ccdare.org



A close-up photograph showing a pair of hands gently cupping a small, vibrant green seedling with several leaves. The hands are positioned over a mound of dark, rich soil, suggesting the act of planting. The lighting is soft, highlighting the texture of the soil and the freshness of the plant.

The Billion Tree Campaign

■
Plant for the planet



“When we plant trees, we plant the seeds of peace and seeds of hope.”

Professor Wangari Maathai,
founder of the Green Belt Movement
and 2004 Nobel Peace Prize Laureate

THE PROBLEM:

Deforestation and forest degradation contribute around 17 per cent of global greenhouse gas emissions. To keep global temperature rises to within 2°C of pre-industrial levels, we need to reverse the trend of deforestation and engage in large scale reforestation.

THE SOLUTION:

Planting trees is a simple solution to mitigating climate change while enriching biodiversity. Trees absorb CO₂, reduce soil erosion, produce life-giving oxygen, provide habitat for wildlife, and are a legacy for future generations. Under the patronage of Nobel Peace Prize Laureate Professor Wangari Maathai, and His Serene Highness Prince Albert II of Monaco, the Billion Tree Campaign is raising awareness of the interdependence of humankind and

the planet’s ecosystems, as well as the links between tree planting and climate change mitigation, the restoration of biodiversity, air and soil quality, and food security.

WHAT UNEP DID:

UNEP’s Plant for the Planet: Billion Tree Campaign is a worldwide initiative that encourages governments, organizations of all kinds, and individuals to plant trees. Since its inception in 2006, the Billion Tree Campaign has recorded the planting of more than 10 billion trees, which – according to estimates based on Intergovernmental Panel on Climate Change guidelines – have the potential to absorb 164 million tonnes of CO₂ per year over their lifespan. Working with partners from sectors as diverse as finance, vehicles, confectionary and cosmetics, NGOs and other United Nations agencies, this UNEP campaign strongly encourages the planting of indigenous or other trees appropriate to the local environment.

THE BIG PICTURE:

Trees and other plants remove carbon from the atmosphere as they grow. The Billion Tree Campaign has inspired the involvement of all 192 United Nations Member States, and numerous governments have registered data on afforestation. Several other

campaigns have modelled themselves on the Billion Tree Campaign, including a global campaign for the protection of one billion trees in the Amazon. The Billion Tree Campaign has captured the imagination of the public – most participants are private individuals – and is a valuable tool to help companies contribute to the fight against climate change. The Plant for the Planet: Billion Tree Campaign won a UN 21 Award as a substantive programme in recognition of its “exceptional contribution towards improving efficiency in the United Nations”.

www.unep.org/unite/30ways
www.unep.org/billiontreecampaign





■ ◆ Protecting gorillas, one meal at a time

Efficient stoves combat
deforestation in gorilla
habitat

"By supporting this innovative Gorilla Organization project, the UN Year of the Gorilla has created a permanent legacy. Distributing fuel-efficient stoves not only helps safeguard the gorillas' habitat, which is shared by us, but it also addresses the major challenges of climate change and poverty."

Elizabeth Maruma Mrema, Executive Secretary, Convention on Migratory Species



THE PROBLEM:

Mountain Gorillas are facing extinction. Fewer than 750 individuals remain, and demands on their forest home and the abundant natural resources it offers – including food, water, and wood for timber and fuel – is threatening the survival of the species. For the gorillas in Virunga National Park, in the east of the Democratic Republic of Congo, the problem has been exacerbated by decades of civil war and unrest, with displaced human populations adding to pressures on the forests. Impoverished communities living around gorilla habitat are forced into the protected parks to collect wood to produce charcoal for cooking. As well as having a devastating impact on the forests, collecting wood is hazardous and time consuming, and the noxious smoke produced by burning it threatens human health.

THE SOLUTION:

At the beginning of 2008 the Gorilla Organization, in partnership with African NGO, AIDE-Kivu, launched a project to encourage the use of fuel efficient stoves. Using simple technology, the stoves reduce consumption of firewood and charcoal by up to 75 per cent, which in turn reduces human pressure on the forest habitat of gorillas and

many other species. The project also benefits public health by reducing the incidence of lung disease. By the end of 2008 almost 500 stoves had been produced, with a further 250 produced in 2009. The stoves are sold for a token \$2 each – less than the cost of production – to encourage the sense of ownership that ensures stoves are used and maintained. The funds generated have been reinvested in the project, and regular workshops involving local communities and authorities promote the many benefits of using fuel efficient stoves.

WHAT UNEP DID:

UNEP's Convention on Migratory Species designated 2009 the Year of the Gorilla. The fuel efficient stoves project was one of several projects UNEP funded in recognition of its significant role in tackling one of the most immediate threats to the future survival of Mountain Gorillas by reducing deforestation. The contribution of the Year of the Gorilla campaign allowed the project to continue throughout 2010.

THE BIG PICTURE:

Fuel efficient stoves are helping to tackle three of the world's greatest challenges: poverty, climate change and loss of biodiversity. More than 3500 people have already benefited from this initiative. Less

money is being spent on fuel, allowing more to be invested on developing livelihoods; health is improving as a result of reduced wood fuel use; and children, freed from time consuming firewood collection, can go to school. The environmental benefits are also considerable. A reduction in fuel consumption in one of the Africa's most densely populated regions is making a significant contribution towards the fight against climate change. And, crucially, as demand for firewood and charcoal falls and reliance on forest resources diminishes, deforestation eases. The project gives the critically endangered Mountain Gorilla population a chance to thrive, and the rich biodiversity of the Virunga National Park – a World Heritage Site – a chance to flourish.

www.unep.org/unite/30ways
www.yog2009.org
www.cms.int





■ Mounting a defence against climate change

CC DARE promotes climate change adaptation in Xai-Xai, Mozambique

“Through the CC DARE programme the communities of Xai-Xai have acquired knowledge on how to tackle adaptation to climate change. The concrete demonstration given by this programme has not only helped to strengthen the capacity of the people of this city but will also help provide the socio-economic information needed for future analysis of the impacts of climate change. These are the kind of actions we want in this city, in this country and in Africa.”

Mrs Rita Muianga, Mayor of Xai-Xai

THE PROBLEM:

The impact of a tropical rainstorm on coastal cities can be devastating. Houses and schools are washed away, enormous gullies appear on slopes, and roads simply disappear in the deluge. This shattering impact is worsened by increased run-off caused by deforestation and consequent inland soil erosion, and by climate change that threatens to bring rising sea levels and more extreme weather events. For coastal cities, such as Xai-Xai in Mozambique, which sits on the banks of the Limpopo River as it meets the Indian Ocean, facing the grim aftermath of storms may become a more frequent experience.

THE SOLUTION:

The Climate Change and Development – Adapting by Reducing Vulnerability (CC DARE) project helps introduce sustainable techniques to adapt land use practices to increasing rainfall under a changing climate. In Xai-Xai this has meant training youth and women’s groups to make and maintain hollow building blocks, which are then used to construct a retaining wall along one of the city’s main roads to counter water erosion. Once completed, the wall was planted with grasses and shrubs that help retain soil as well as beautify

the structure. Local people and authorities learnt about climate change adaptation, about the importance of maintenance and, most importantly, about the impact of small, targeted interventions made real through collective action.

WHAT UNEP DID:

UNEP and UNDP, with funding from the Danish Ministry of Foreign Affairs, implemented a programme to demonstrate concrete adaptation action at the community level. In the case of Xai-Xai this meant partnering with the city council, the Centre for the Sustainable Development of Coastal Zones, and with the people of the city, to provide technical assistance and to support the establishment of communal committees to mitigate and prevent erosion and soil degradation.

THE BIG PICTURE:

At a cost of less than \$50,000, there has been a transformation in community and authority understanding of the relationship between the chronic erosion problems that plague the city and climate change. Crucially, it has also led to an increase in capacity to mobilize community action to protect against climate change, and develop strategies to adapt to it. The Xai-Xai project has also provided socio-

economic information and data that will help model the impact of climate change on coastal cities elsewhere in Mozambique and across the developing world, enabling suitable adaptation action to be taken, with resulting savings in both time and money.

www.unep.org/unite/30ways
www.ccdare.org



"In the next few decades, close to two billion vehicles will be added to the global fleet – if we do not address this growth and ensure that cleaner, more efficient transport solutions are available and adopted, the subsequent growth in pollutant and CO₂ emissions will overcome global mitigation efforts in other sectors. We now have ready the technology and policies that can double auto fuel efficiency."

Sheila Watson, Director of Environment, FIA Foundation

The Global Fuel Economy Initiative: clean tech in action

**Cars and climate:
promoting cleaner,
more efficient vehicles**



THE PROBLEM:

The transport sector accounts for approximately one quarter of all energy related CO₂ emissions, a figure set to rise to one third by 2050. By then, the world's vehicle fleet will have tripled, with over 80 per cent of that growth occurring in the developing world. There is an urgent need to find a way to reconcile legitimate aspirations for mobility and an ambitious reduction in CO₂ from cars. With unprecedented growth in motorization worldwide in the next few decades, governments in both developed and developing countries need to act to stem the expected exponential rise in emissions. Developing countries are currently ill-equipped to take full advantage of the available technology and policy approaches to reducing greenhouse gas emissions from transport.

THE SOLUTION:

The average fuel economy of the global light duty vehicle fleet can be improved by at least 50 per cent by 2050, relative to 2005 levels. But realizing this improvement will require a global approach – and this includes involving developing countries, only a handful of which currently have in place any policies on vehicle fuel efficiency. The Global Fuel Economy Initiative (GFEI) is

acting now to help these countries evaluate and apply the wealth of knowledge and technology available to make their growth greener. Cutting fuel consumption in half by increasing fuel and vehicle efficiency would reduce global emissions of CO₂ by over one gigatonne a year – effectively capping them at current levels – and would also cut oil import bills by over \$400 billion (based on an oil price of \$100 a barrel).

WHAT UNEP DID:

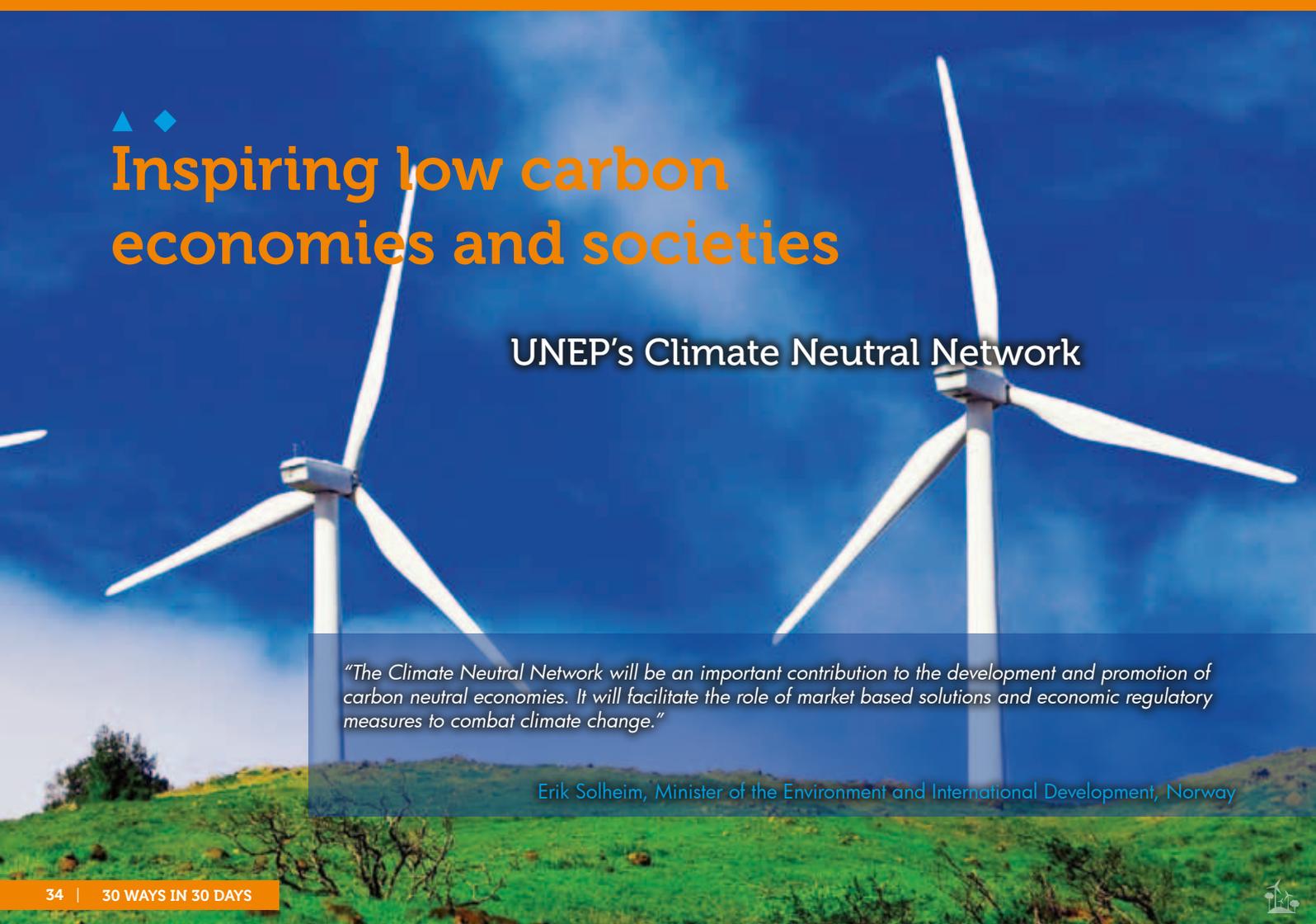
UNEP teamed up with road safety, environmental protection and sustainable mobility campaigners, the FIA Foundation, the International Energy Agency and the International Transport Forum, to form the GFEI. This is the first global initiative to offer developing countries access to the practical technology and policy expertise to lower greenhouse gas emissions from the road transport sector. UNEP's support on the ground allows countries to access the best available knowledge, training and resources to evaluate the technology and policies available to them, and to see what has worked in the other parts of the world. This hands-on approach is being pioneered in Ethiopia, Indonesia, Chile and Costa Rica.

THE BIG PICTURE:

GFEI aims to encourage countries to commit to ambitious but achievable vehicle sector emissions reductions that will contribute to a 50 per cent improvement in vehicle efficiency worldwide by 2050: the 50 by 50 campaign. The initiative aims to achieve an international impact, with the potential to deliver dramatic savings in both emissions and costs through its approach. If successful, the 50 by 50 campaign will save two billion tonnes of CO₂ per year by 2050, and simultaneously generate hundreds of billions of dollars of cost savings, especially to oil importing countries and consumers. It would also support further improvements in air quality and in safety benefits related to lighter vehicles, which would reduce the incidence of injury to pedestrians and non-motorized traffic. Manufacturers could also anticipate cost savings from greater efforts to achieve global harmonization of regulatory systems that should be cheaper to comply with than the current patchwork of different systems.

www.unep.org/unite/30ways
www.50by50campaign.org





▲ ◆
**Inspiring low carbon
economies and societies**

UNEP's Climate Neutral Network

"The Climate Neutral Network will be an important contribution to the development and promotion of carbon neutral economies. It will facilitate the role of market based solutions and economic regulatory measures to combat climate change."

Erik Solheim, Minister of the Environment and International Development, Norway



THE PROBLEM:

As the global community has become progressively more aware of the need for concerted and coordinated action to address climate change, innovative action has emerged at all levels of society and across the global economy. The challenge, however, is to harness such innovations – from local solutions and grassroots initiatives, to cutting edge technologies developed by multinational corporations and think tanks – to identify and leverage what works. The further challenge is to accelerate and scale up these diverse solutions.

THE SOLUTION:

Encouraging and cross-fertilizing the ideas and initiatives that are springing up all over the world is a priority. Doing so will help ensure that these ideas can be replicated and leveraged as inspirations to sustain coordinated global efforts to combat climate change. These ideas should be encouraged as viable independent initiatives, while also being recognized as providing support to multilateral political efforts to combat climate change.

WHAT UNEP DID:

In February 2008, UNEP launched the Climate Neutral Network (CN Net), a web based platform to showcase strategies and initiatives to reduce carbon footprints, provide opportunities for knowledge sharing and technology transfer, and promote the global transition to low-carbon economies and societies. Over 250 governments, regions, cities, companies and organizations from around the world have joined CN Net, each of them required to publish a climate neutral strategy on the CN Net website. CN Net contributes directly to UNEP's goal of improving the understanding of climate change science and its use in sound policy making, and of enhancing the general understanding of climate change by communicating key climate change messages.

THE BIG PICTURE:

Some 170 of CN Net's participants are companies, including some of the world's best recognized brands, such as Microsoft, Dell, Cable & Wireless, Deutsche Post DHL, Deutsche Bahn, Deutsche Bank, Puma, Skanska, Bayer AG, Japan Airlines, Toyota and News Limited. CN Net participation has also grown markedly in the developing world: half of the countries that have committed to CN Net are emerging economies or those in

transition. CN Net participants are pioneers in climate neutrality, and have adopted some of the most innovative and ambitious climate neutral strategies in the world:

- Costa Rica aims to be climate neutral by 2021, when it celebrates 200 years of independence.
- Fujifilm Group has embraced the goal of climate neutrality by setting challenging emission reduction targets at its six factories in Japan.
- The Norwegian city of Arendal is already climate neutral, and has committed to reducing its emissions by 90 per cent within 10 years.
- The region of Wenjiang in south west China aims to become a zero carbon emission city by 2015, through a greening programme and emissions monitoring. Over 450 high polluting enterprises have been either shut down or upgraded since 2000.
- French development NGO Planète Urgence offsets all emissions from its operations, provides financial incentives for employees to reduce their emissions, and carries out reforestation projects in developing countries.

www.unep.org/unite/30ways
www.unep.org/climateneutral





A regional model for global reforestation

The Appalachian Regional Restoration Initiative (ARRI)

“UNEP’s partnership with the Appalachian Regional Restoration Initiative has energized our tree planting efforts on the three quarters of a million acres of degraded lands in the Appalachian coalfields that could be available for reforestation. With an army of citizen volunteers from ARRI partners, we hope to make a significant contribution to UNEP’s goal of planting a tree for each one of the 320 million US citizens.”

Dr Patrick Angel, Senior Forester/Soil Scientist, US Department of Interior

THE PROBLEM:

Despite being endowed with a wealth of natural resources, the Appalachian region of the eastern United States has long struggled with poverty. The area is home to some 23 million people, but the exploitation of Appalachia's coal reserves has left a scarred and damaged landscape in an area whose forests support some of the highest biological diversity in the world's temperate regions. In a region facing high unemployment and environmental degradation, increasing local wealth while sustaining biodiversity and aiding the recovery of damaged ecosystems is a solution to multiple challenges.

THE SOLUTION:

The Appalachian Regional Restoration Initiative (ARRI) was created in an effort to reforest active and abandoned mine lands. Since 2004, some 60 million trees have been planted on about 87,000 acres in Appalachia under ARRI's guidance. The excitement and energy generated by the project has resulted in the Green Forest Works for Appalachia, which proposes planting 125 million trees over the next five years, creating more than 2000 green jobs and restoring forests on approximately 70,820 hectares of barren mine lands

across Alabama, Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia and West Virginia. Offering economic benefits for investors and employment opportunities for local people, trees also minimize soil erosion, remove carbon dioxide from the air to fight climate change, provide wildlife habitat and diverse plant species, provide watershed improvement, and are a resource for recreational activities such as hiking and camping.

WHAT UNEP DID:

Inspired by UNEP's Billion Tree Campaign, ARRI pledged to plant 38 million trees over a three year period. In support of this partnership, UNEP helped volunteers plant trees on an abandoned mine site – an event which led to the creation of a green jobs proposal to stimulate the economy of Appalachia and reap the ecological benefits of a region-wide reforestation effort. ARRI is a capacity building effort between UNEP, the US Department of the Interior's Office of Surface Mining Reclamation and Enforcement, and the San Francisco-based Baum Foundation.

THE BIG PICTURE:

If in one year an average tree inhales 12 kg of CO₂ and exhales enough oxygen for a family of four, then the impact of 38

million – or even 125 million – trees can be transformative. Reforestation under ARRI will produce a carbon sink to help mitigate the effects of climate change, sequestering between three and five times more carbon than grassland, while giving additional benefits such as biodiversity, soil and water conservation, and reducing forest fragmentation. The benefits for landowners include increased timber value, tax incentives, the possibility to lease for recreational purposes, and carbon sequestration credits. Providing alternative livelihoods based on ecosystem services will create additional jobs and add vitality to a region plagued by unemployment. Appalachian communities will enjoy better flood control, the restoration of native forests for culture and recreation, and additional tax revenue. The ARRI project is testimony to the synergies that effective partnerships can achieve, and is an example of a solution that can be replicated in many other areas of the world on a small or large scale, limited only by available resources and ambition.

www.unep.org/unite/30ways

www.unep.org/billiontreecampaign





"The average Norwegian business or city administration can reduce greenhouse gas emissions by two tonnes per employee using the Climate Partners approach."

Svein Tveitdal, Climate Partners Project Manager

Climate Partners in Agder, Norway

▲
Building a green business region



THE PROBLEM:

Emissions generated in urban areas represent one of the greatest challenges in addressing climate change. Buildings alone are responsible for an estimated 1.45 billion tonnes of CO₂ emissions annually in industrialized countries, and for around one third of global greenhouse gas emissions, while industry emissions are over 1.3 billion tonnes annually, representing almost a quarter of annual emissions. While many municipal areas and businesses within them are prepared to face this challenge, it is difficult to make a meaningful impact on overall emissions without a joint vision, flexibility and cooperation. The Agder region of southern Norway saw clearly that many businesses that wanted to provide products and services for tomorrow's low-carbon society lacked information about the threats and opportunities that climate change presents. And while cities and regions needed to find a way to support local businesses in this endeavour, they also needed to reduce their own greenhouse gas emissions to gain credibility in the climate market. Ensuring that all parties had the key information and support they required to make appropriate changes demanded a well informed and coordinated approach.

THE SOLUTION:

The Climate Partners network was established in Agder in 2009, and now includes the two counties that make up the region, the three largest cities, and 21 companies in its rapidly expanding membership. The region has a population of 270,000, and some 15,000 people work for network employers, generating a combined turnover of about US\$2.5 billion. Using UN guidelines on climate neutrality, and with guidance from UNEP's Climate Neutral Network (CN Net) – a hub for the dissemination of climate neutral strategies and information – partners calculate their carbon footprint, prepare an emissions reduction plan and purchase offsets. Partners pay a variable membership fee depending on employee numbers, and contribute to the short term goal of reducing their emissions. The city of Arendal – the capital of East Agder county – is run by Norway's first climate neutral city administration, which is committed to reducing its emissions by 90 per cent within 10 years: equivalent to two tonnes per employee, or 6,000 tonnes of CO₂ emissions. Other Climate Partners are developing similar goals.

WHAT UNEP DID:

UNEP founded a novel and practical solution to the growing global need for tools and resources in tackling climate change, by forming the Climate Neutral Network (CN Net) in 2008. CN Net operates an interactive website hub for promoting successful climate neutral strategies, and provides the tools and resources to develop them. Both CN Net, and UNEP's publication *Kick the Habit – A UN Guide to Climate Neutrality*, have been instrumental in the activities of the Climate Partners network, providing guidance on methodologies for carbon footprint calculation; climate neutrality; offsets and environmental certification; on green IT; and on climate friendly transport, helping partners to develop strategies for reducing their vehicle fleet emissions by 95 per cent by 2020. UNEP also provided access to climate change information and green business opportunities.

THE BIG PICTURE:

The Climate Partners initiative has been widely communicated in Norway, and the Norwegian Government is considering the model's potential application as a strategy for the Government and its 320,000 employees to become climate neutral.

www.unep.org/unite/30ways
www.unep.org/climateneutral



■ ◆ Creating the climate for change in Sudan

Combating climate change in Sudan



“UNEP’s greening campaign and awareness raising efforts have really helped create a more tangible image which has helped our students relate to climate change. More and more trees need to be planted around Central Equatoria to make up for the negative impacts of climate change on ecosystems and people.”

Mr Beetwbiza Frank, School Teacher, Juba



THE PROBLEM:

Until the late 20th century the Sahel – a transitional zone that stretches across the African continent, straddling the boundary between the Sahara desert to the north and savannah lands to the south – was characterized by baobab and acacia trees and sparse grass cover. Today, climate change and the resulting desertification is changing this picture. Rainfall in Darfur has become more erratic and there is mounting evidence that variable rainfall across the country has caused significant stress on both pastoralist and farming communities – particularly in West Sudan and Kordofan – affecting water supplies and aggravating conflict. Armed conflict for much of the past 50 years has added to Sudan's environmental degradation, and conflict over scarce natural resources is a destabilizing influence in some parts of the country. Displacement has created dense urban populations with distorted economies, which has created an insatiable demand for timber for fuel wood, charcoal and brick making. Increased energy demand is now a major driver of environmental degradation in Sudan, in particular the loss of forest cover, leaving communities more vulnerable to the effects of climate change.

THE SOLUTION:

Managing the environment to address climate change and human impact is critical to achieving lasting solutions. One solution is to promote a combination of improved fuel efficiency, greater use of alternative energy, and well managed fuel woodlots to prevent further depletion of forest resources in Sudan. Another is to promote community based environmental management as a key to sustained environment rehabilitation and protection. Strengthening national capacity, in areas such as investment strategies, and water supply and demand, will ultimately enable the Sudanese Government to develop a robust national adaptation policy.

WHAT UNEP DID:

UNEP implemented the Darfur Alternative Energy Project, which assesses and promotes alternative energy sources. The Keep Juba Green campaign, launched by UNEP in June 2010, is working to reverse deforestation and renew greenhouse gas sinks by working with local communities to plant one million trees over the next 12 months. With support from the Governments of the United Kingdom, Italy and the United States, UNEP helped the Sudanese Government to draft environmental policy and legislation that will enhance national monitoring programmes and research capacity to detect biological, physical and chemical fluctuations as a result

of climate change. UNEP has also contributed to UN efforts to develop a recovery strategy for Darfur, which includes integrated water resource management, environmental technology transfer, community environmental management, and support to environment ministries.

THE BIG PICTURE:

The impact of natural resource scarcity, degradation and climate change in Sudan is poorly understood. The capacity building that constitutes an important part of UNEP's work in Sudan is helping to address this, to provide a basis for the comprehensive long term planning that is vital if there is to be sustainable peace in the country. UNEP is working to help the Government of Sudan better understand the potential impacts of climate change and to incorporate climate considerations into long term development plans, particularly for agriculture and water.

www.unep.org/unite/30ways
[www.unep.org/sudan/
UNEPintheRegions/CurrentActivities/
Sudan/tabid/294/language/en-US/
Default.aspx](http://www.unep.org/sudan/UNEPintheRegions/CurrentActivities/Sudan/tabid/294/language/en-US/Default.aspx)



Sugar sweetens the deal for renewable energy

Cogeneration for Africa project

“Cogeneration is an obvious investment for many industries. Biomass waste from industrial processing is commonly burnt for heating and steam. By adding a turbine, the waste steam also makes electricity and often doubles the energy you can get from the waste.”

Geordie Colville, UNEP climate change expert, Nairobi, Kenya



THE PROBLEM:

Most of rural Africa has little or no electricity. While many African countries rely on fossil fuels or hydroelectric generation for their national needs, at the local, rural level most households must burn biomass – generally wood or charcoal – to cook and to warm their homes. African populations are growing, and so is the demand for electricity. The search is on for low cost, renewable, indigenous fuels that will cut greenhouse gas emissions, and reduce energy costs and dependence on imports.

THE SOLUTION:

Cogeneration – the simultaneous production of heat and power – can help meet African energy needs. The waste products of sugar, pulp and paper, wood processing, coffee, maize, rice, sisal, palm oil and other crops can be turned into electricity, generating substantial additional profits for the industries themselves and the farmers who provide the feedstock. In East and Southern Africa, where dependence on hydropower is high, biomass can supplement power needs when rivers and dams are low, and help reduce the need for emergency diesel, coal or oil fired power generators. The Cogeneration for Africa project aims to reach around 10 million sugar farmers

and their dependants in Kenya, Ethiopia, Malawi, Sudan, Uganda, Tanzania and Swaziland, promoting more than \$300 million of cogeneration investment and installing 40MW of generating power in six years. And because cogeneration is so profitable, the project expects to set the stage for accelerated investment in coming years.

WHAT UNEP DID:

UNEP implemented Cogeneration for Africa, with \$5.25 million in funding from the Global Environment Facility, in partnership with the African Development Bank and the African Energy Policy Research Network. To date, the project has: influenced policy on the sale of renewable energy to national grids in Kenya and Tanzania; conducted workshops on technical and financial issues; supported feasibility studies and the identification of potential cogeneration investments; and concluded nine cooperation agreements with agro-industrial project developers in Kenya, Uganda, Tanzania and Malawi to build cogeneration facilities.

THE BIG PICTURE:

Cogeneration for Africa builds on the success of cogeneration in Mauritius, which currently provides close to 40 per cent of

the country's electricity needs. The UNEP *Harnessing Carbon Finance to Promote Sustainable Forestry, Agro-Forestry and Bioenergy* report (2009) estimates that, based on existing sugarcane production, cogeneration could contribute an additional 16.2 per cent of power capacity in Kenya, 23.7 per cent of in Malawi, and a remarkable 144.5 per cent in Swaziland. There are plans to increase the scope of the project elsewhere on the continent through capacity building, and technical and investment support.

www.unep.org/unite/30ways
<http://cogen.unep.org>
www.atrepren.org/cfa



▲ Going where utilities fear to tread

African Rural Energy Enterprise Development (AREED)

"Don't burn your money."

Commercial message of Toyola Energy targeting rural and peri-urban users of traditional charcoal and wood fuelled stoves



THE PROBLEM:

For people living in rural communities in some parts of Africa there is simply not enough energy to go around. In a world focused on using less energy, these people need more: they need access to a reliable fuel supply to cook with, and to heat and light their homes. A person in sub-Saharan Africa has the lowest energy consumption in the world, consuming just one thirtieth of the energy of an average North American. Many communities are a long way from the supply grids of energy companies, and local businesses have difficulty attracting finance. So, how can these people access significantly more energy, while minimizing any additional greenhouse gas emissions?

THE SOLUTION:

Enter AREED – African Rural Energy Enterprise Development. This UNEP programme supports innovative energy entrepreneurs with business development services and access to capital. When Suraj Wahab and Ernest Kyei wanted to start a small business selling efficient cooking stoves near their homes on the fringe of Ghana's capital, Accra, they could not get a loan from any of the local banks. They turned to AREED, got professional help to prepare a business plan, and eventually secured a loan of \$270,000. Four years later, their company, Toyola Energy, has supplied 50,000 homes in six regions of Ghana with energy efficient

cooking stoves that have helped offset an estimated 15,000 tonnes of carbon dioxide emissions. Toyola Energy has diversified into solar lanterns and has created more than 200 jobs. The company's success is now so widely recognized that this year Suraj Wahab was named Africa's Energy Personality of the Year. More than 30 companies in five African countries owe their existence to AREED.

WHAT UNEP DID:

With backing from the UN Foundation and national partners, UNEP launched AREED in 2000 in Senegal, Ghana, Mali, Tanzania and Zambia. Since then:

- More than 500 entrepreneurs have received enterprise development training to create or improve their businesses.
- Close to \$2 million has been invested in 31 businesses that provide energy services for water pumping, water heating and cooking. These businesses supply liquid petroleum gas, wind powered water pumps, solar photovoltaic power systems, energy efficiency technology, solar crop dryers and solar water heaters.
- More than 224,000 people in 44,000 households now have access to cleaner energy.

THE BIG PICTURE:

About 1.6 billion people lack access to modern energy, and rely on traditional biomass use for heating and cooking. Inefficient domestic

cooking devices, such as three stone stoves, together with fuels with poor burning characteristics, such as humid wood, charcoal and dung, result in incomplete combustion, which in turn leads to significant emissions of black carbon – particles more often known as soot. Inefficient cooking stoves are estimated to be responsible for 25 per cent of black carbon emissions. Also, use of wood fuel and charcoal causes a high and often unsustainable demand for wood, leading to deforestation and forest degradation, and black carbon emissions cause severe respiratory and pulmonary diseases. By focusing on innovative, small scale energy financing, AREED makes an impact on climate change, biodiversity and ecosystem conservation, and on human health and development.

www.unep.org/unite/30ways

www.ccdare.org

www.uneptie.org/energy/activities/reed/areed.htm





Green neighbourhoods span the globe

One Planet Communities

THE PROBLEM:

Buildings are responsible for more than one third of global energy use and in many countries are the largest source of greenhouse gas emissions. Where and how we live are urgent sustainability issues,

particularly in developed countries, where people consume a large proportion of the planet's natural resources. A shift to sustainable lifestyles is essential if we are to make the significant cuts in greenhouse gas emissions that our climate needs.

THE SOLUTION:

BioRegional works in partnership with property developers across the globe, encouraging them to think holistically about sustainability. Since only green lifestyles in combination with green buildings can deliver





"It's time to stop planning for energy efficiency and start planning for zero impact. It's time to move past 'green' and embrace truly sustainable development. One Planet Communities has given us the framework to do just that."

Geof Syphers, Chief Sustainability Officer,
CoddlingEnterprises
(Developer of Sonoma Mountain Village,
a One Planet Community in California)

the dramatic reduction in carbon emissions we need, BioRegional created the One Planet Communities programme, using the ten One Planet principles, which cover zero carbon and waste, sustainable transport, materials, food, water and land use, with regard for culture, equity, health and happiness. These principles inform the design, construction, governance, community engagement and long term estate management of the One Planet Communities, which are expanding in five continents and providing homes for around 100,000 people.

WHAT UNEP DID:

UNEP set up the Climate Neutral Network (CN Net) in 2008, an internet based forum for the exchange of strategies and initiatives

to reduce carbon footprint, share knowledge, create opportunities for technology transfer, and promote the global transition to low-carbon societies. BioRegional is part of CN Net's 250 member network, and through it, has been able to share its ideas and work with some of the world's leading companies and organizations. Six of the eight Sustainable Communities and Cities referred to in 2010's UN-DESA report *Trends in Sustainable Development: towards sustainable consumption and production* are part of the One Planet Communities programme.

THE BIG PICTURE:

Investment in developments and buildings using the One Planet Communities principles is approaching \$40 billion, with support from public and private funding bodies and

more affluent partners helping to finance developments in poorer parts of the world. One Planet Communities developments are springing up around the world and its principles are being applied to the retrofit of existing communities in public housing in London and elsewhere. One Planet Communities range in size from hundreds of dwellings to large scale, mixed use communities such as the 2000-home Sonoma Mountain Village in California, the mainly commercial 350,000 m² development of Barangaroo in Sydney, to entire cities such as Masdar in the UAE, where a Sustainability Action Plan has been produced based on One Planet Communities principles.

www.unep.org/unite/30ways
www.bioregional.com
www.unep.org/climateneutral



▲ ◆ Greening the blue

Making the United Nations a more sustainable organization

“Greening the Blue brings together the latest information about what the UN system is doing and offers suggestions for individuals and organizations to get involved to help make our organization and its activities a beacon for environmental sustainability.”

United Nations Secretary General, Ban Ki-moon



THE PROBLEM:

As the leading global authority on environment and development, the United Nations plays a critical role in encouraging businesses and governments to improve their sustainability performance. Naturally, this places a moral imperative upon the United Nations to green its own operations and become a more sustainable organization. But implementing any strategy across such a huge and diverse organization is a major challenge. Sharing information on climate change with 90,000 staff, and another 110,000 in peacekeeping operations, demands creativity and rigour.

THE SOLUTION:

The UN Climate Neutral Strategy was approved in 2007, and a Sustainable United Nations (SUN) team was established to oversee its implementation, and help UN organizations to measure and reduce their environmental impact. With total emissions of more than 1.7 million tonnes of CO₂ a year, the UN is focusing its reduction efforts on buildings, travel and procurement.

WHAT UNEP DID:

UNEP coordinated efforts across 49 UN organizations to prepare the first generation of greenhouse gas inventories in 2009, and to develop emission reduction plans for each UN organization. Knowing that awareness and communications would play a central role, UNEP launched a UN-wide campaign on in-house sustainability – Greening the Blue – to highlight ways in which staff could contribute. The campaign continues to attract media attention and the website attracts visitors from around the world, demonstrating that the UN's example of good environmental housekeeping can be followed by other organizations.

THE BIG PICTURE:

Buildings account for around one third of global greenhouse gas emissions, while the aviation sector produces an estimated two per cent of global emissions from human activity. With its multitude of offices and staff around the world, the greening of UN workplaces and work practices can help cut carbon emissions. Across the UN, the campaign is showing concrete results. For example: the World Food Programme has set in place a standard for the sustainable procurement of air conditioning; peacekeeping missions have

planted 118,000 trees, helping to reforest the world's trouble spots; staff at UNAIDS can travel no more than 21 days a year; and videoconferencing has become a key tool at the UN Conference on Trade and Development, which has pledged to cut its emissions by 20 per cent by 2020. The UN Mission in Sudan and the Government of Sweden are investing \$5 million to introduce technologies for the treatment of waste, wastewater and efficient use of water and energy at military posts, with a goal to achieve reductions of 30 per cent in water consumption, 25 per cent in energy expenditures, and 60 per cent of waste volume.

www.unep.org/unite/30ways
www.greeningtheblue.org





• Maps for a greener REDD+

Using spatial analysis for
REDD+ benefits beyond
carbon

“Immediate action on REDD+ is a critical part of the climate change solution. Preserving forests also provides other valuable benefits: biodiversity, soil conservation and flood control. Combined, such services are worth billions — perhaps trillions — of dollars to the global economy.”

Ban Ki-moon, Secretary-General of the United Nations

THE PROBLEM:

Deforestation and forest degradation, caused by agricultural expansion, logging, and other human activities, contribute around 17 per cent of global greenhouse gas emissions. REDD (Reducing Emissions from Deforestation and Forest Degradation) is a mechanism aimed at creating a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. Forests play a central role in the global carbon balance, but they also provide a multitude of other services alongside carbon storage. Forests contain over two thirds of the world's terrestrial biodiversity, and are a source of vital ecosystem services which provide people with food, water, fuel wood and regulatory services such as climate and flood regulation. But there is insufficient awareness of the potential of REDD+, and countries often lack the tools to implement it in ways that deliver all these forest benefits.

THE SOLUTION:

To help countries understand REDD+ and to recognize and tap its potential, the UN-REDD Programme offers assistance in several ways, including capacity development, governance, engagement of Indigenous Peoples, and technical support. One of the key tools it offers is a carbon mapping capability that shows the carbon stored in ecosystems, highlighting areas of significant biodiversity and ecosystem services importance, and threats to forests themselves. UNEP-World Conservation Monitoring Centre has worked with UN-REDD partner countries to develop these maps that provide essential knowledge and guidance, which can be used with other decision support tools to help countries to develop national REDD+ strategies that maximize the development potential that forests provide.

WHAT UNEP DID:

The UN-REDD Programme is a partnership between FAO, UNDP and UNEP, that helps developing countries to prepare and implement national REDD+ strategies and mechanisms. Through the programme, UNEP provides financial, technical and strategic support to the development of national REDD strategies, aimed at reducing the rate of carbon loss from land-based activities. UNEP

works closely with geographic information system specialists in national and provincial institutions in many developing countries, to gather and collate information which provides spatial analysis tools in support of REDD+ strategy development.

THE BIG PICTURE:

At the global level, the UN-REDD Programme seeks to build consensus and knowledge about REDD+ and raise awareness about the importance of including a REDD+ mechanism in a post-2012 climate change agreement. It also provides opportunities for dialogue between governments, civil society organizations and technical experts, to ensure that REDD+ efforts are based on science, and that they take into account the views and needs of all stakeholders. The UN-REDD Programme supports countries in their efforts to integrate multiple benefits into their REDD+ strategies and development plans. Replicable initiatives such as the spatial analysis activities help to ensure that forests continue to provide multiple benefits for livelihoods, conserve the planet's biodiversity, and act as important carbon stores.

www.unep.org/unite/30ways
www.un-redd.org
www.carbon-biodiversity.net/



"The work carried out by the International Environmental Technology Centre has already revealed great opportunities of resource recovery and consequent economic and environmental gains from improved waste management."

*Surya Chandak, Deputy Director
UNEP International Environmental Technology Centre*

कृषिजम्बु जैविक फोहरमैलालाई श्रोतमा परिणत गर्ने संयुक्त आयोजना
Converting Waste Agricultural Biomass into Resources
A Joint Project Sponsored by:

United Nation Environment Programme
Division of Technology, Industry & Economics
International Environmental Technology Center (IETC)
Osaka, Japan
Implemented by
Society for Environment and Economic Development Nepal
(SEED Nepal)
&
Sustainable Energy Management Centre (SEM)
Ward - 17, Gollighur Barack, S.S. 207102, Nepal

Converting agricultural
biomass waste into energy

Waste not, want not



THE PROBLEM:

Waste management is a global issue and, exacerbated by population and economic growth, is an increasingly serious issue in developing countries. Globally, some 140 billion tonnes of agricultural biomass waste is produced annually – most either left to rot in the field or burnt. In addition to causing environmental damage through greenhouse gas emissions, this also represents the loss of a valuable resource that could provide energy to rural populations, who are often dependent on wood and kerosene to meet their energy needs, with the consequent negative impacts on health and the environment.

THE SOLUTION:

Converting waste agricultural biomass into energy can provide a decentralized energy source in rural areas while simultaneously achieving a cost effective solution to waste disposal, and a reduction in greenhouse gas emissions. UNEP's International Environmental Technology Centre (IETC) is working with local institutions, government, business and communities in pilot areas in Nepal and Sri Lanka. It has published guidelines on how to assess waste agricultural biomass – including rice husks, grass, and fruit and vegetable waste – and



to identify appropriate technologies and business models.

WHAT UNEP DID:

Working with principal partners, the National Cleaner Production Centre in Sri Lanka and the Society for Environment and Economic Development in Nepal, UNEP has trained communities and helped local partners to procure and install technologies to treat some 2000 tonnes per annum of rotten vegetables in Nepal, and 1000 tonnes per annum of mixed dry agricultural waste in Sri Lanka, across the two pilot areas. The projects have generated compost as well as heat used to dry limes and other fruit, enhancing livelihoods in one of Sri Lanka's poorest areas, and have given vocational training to prisoners in Nepal, assisting in their rehabilitation. Both projects have been resounding successes. In Sri Lanka an

international NGO has expressed interest in supplying waste dryers to 25 women's groups. UNEP is already working to extend the initiative to Pakistan, the Philippines and other countries in Asia.

THE BIG PICTURE:

By demonstrating the success of the technology to policymakers, there are high hopes that the project will facilitate development of national policy on the treatment of waste agricultural biomass. At a cost of only \$40,000 for each country, the project has made a substantial contribution to reducing and avoiding greenhouse gas emissions through reducing the amount of agricultural biomass that is left to rot in fields or is burnt, and also reducing the amount of kerosene and wood burnt as fuel. Moreover, the project has also had a dramatic impact on livelihoods. There is huge international scope for replicating this economical and straightforward solution for converting waste agricultural biomass into a resource, for the benefit of both the environment and of local communities.

www.unep.org/unite/30ways



Bus rapid transit and pedestrian improvements in Jakarta

"Jakarta has become a role model for cities of other countries in dealing with pollution that causes global climate change, and will be an example to other developing countries in reducing carbon dioxide emissions."

Daniel Wiener, Executive Director of Economic, Ecology, Social Responsibility (ECOS)

Life in the fast lane



THE PROBLEM:

In an increasingly urbanized world, more and more people are taking to crowded roads in their cars to go about their business and daily activities. Traffic congestion is the bane of many lives, and also contributes to air pollution, reduced road safety, unnecessary fuel consumption and loss of workplace productivity. The International Energy Agency has estimated that fuel consumption and CO₂ emissions from the world's cars will roughly double between 2000 and 2050. Worldwide, cars account for close to half the transport sector's CO₂ emissions. The pressure on transport infrastructure is huge, and is expected to worsen. In Jakarta, Indonesia, the population grew from 3.9 million in 1970 to 7.6 million in 1990, and is expected to grow to 17.2 million by 2015. All of these people will need access to transport of some kind, in order to go to work and school, shop, socialize and thrive.

THE SOLUTION:

A full bus is far more efficient than one or two people in every car. With this in mind, Jakarta's authorities developed the city's Bus Rapid Transit (BRT) system, reallocating city centre road space to improve public transport services. A combination of bus

lanes, bike paths and bike rental, regulations on a minimum of three passengers per car during peak hours, bus priority at crossroads, and enhanced walking areas, has been used to get people out of their cars and into buses and onto bikes. The Transjakarta Busway was used by some 250,000 people per day in 2009, an 11 per cent increase on the previous year. This resulted in a saving of more than 36,000 tonnes of CO₂ emissions. The estimated fuel savings by busway users amounts to 91 billion Indonesian rupiahs (about \$100 million).

WHAT UNEP DID:

UNEP, with support from the Global Environment Facility, contributed technical, institutional and legal assistance, together with more than \$5.8 million towards the cost of planning, designing and implementing the busway. UNEP's support helped to kick-start a public transport transformation in Jakarta, helping to maximize the use of the busway (over 1 billion passenger-kilometres were travelled in 2009) to encourage a shift away from private car use in order to achieve significant cuts in greenhouse gas emissions. A range of work has been done to improve efficiency of the transport system and to achieve environmental benefits,

including: integrating multiple bus operators into the new system; developing integrated e-ticketing; improving revenue collection; facilitating access to compressed natural gas fuel supply for buses; planning feeder bus services to the BRT; and designing travel demand management measures that integrate the busway with non-motorized transport to improve overall efficiency.

THE BIG PICTURE:

A dozen cities in Indonesia have launched bus improvement projects that are based on Jakarta's BRT. Modern and cost effective bus systems have transformed cities into more liveable environments. BRTs can be constructed within the budgets of most municipalities. UNEP's work on BRTs in Jakarta, Dar es Salaam and Cartagena has resulted in the publication of a comprehensive step-by-step guide to BRTs. The Bus Rapid Transit Planning Guide covers everything from project preparation to the implementation of these cost effective transport solutions.

www.unep.org/unite/30ways
www.uneptie.org/energy/activities/brt



"As soon as the CASCADe programme had started, we made progress in all our projects. CASCADe made local and international experts join forces."

Mamadou Ndiaye, Director General
Asiyla Gum company SARL, Senegal

CASCADe – Carbon Finance
for Agriculture, Silviculture,
Conservation and Action
against Deforestation

■ ●
**Planting a seed
for climate
protection**



THE PROBLEM:

Unsustainable use of forests causes approximately 17 per cent of greenhouse gas emissions globally. It also causes degradation of ecosystems and loss of biodiversity, threatens local livelihoods, and has serious impacts on many of the world's poorest people. In Africa, around 600 million people rely on forests and woodlands for their livelihoods. Despite the rapid growth of carbon finance transactions, projects in sub-Saharan Africa are often ignored because of a misconception that the region has limited potential.

THE SOLUTION:

The Clean Development Mechanism, established under the Kyoto Protocol, allows industrialized countries to receive carbon credits for financing carbon mitigation and sequestration projects in less developed countries. Since 2007 UNEP's CASCADE – Carbon Finance for Agriculture, Silviculture, Conservation and Action against Deforestation – programme has been helping Benin, Cameroon, the Democratic Republic of Congo, Gabon, Madagascar, Mali and Senegal to generate carbon credits by providing technical support and training to project developers, communities and national climate change institutions.

By supporting replicable projects in the forestry, agriculture and bioenergy sectors, CASCADE is opening up opportunities for African participation in the CDM and voluntary carbon markets, while linking buyers and sellers and facilitating regional cooperation.

WHAT UNEP DID:

The CASCADE programme is implemented by UNEP and the UNEP Risoe Centre, supported by FFEM (the Fonds Français pour l'Environnement Mondial). It has provided technical assistance to more than 20 projects in community reforestation, commercial forestry, energy efficient cooking stoves and fish smokehouses, and bioenergy, and has avoided deforestation in seven African countries. Targeted institutional support has strengthened national regulatory frameworks for carbon finance projects and established a strong francophone African network of technical experts.

THE BIG PICTURE:

The success of CASCADE's pilot projects provides a framework for the programme's expansion into other countries, while its contribution to national and international policy debates is helping shape a more inclusive climate regime. Project developers

and communities in Africa still require substantial assistance to overcome technical barriers and to access finance, so UNEP is planning a follow-up programme. This will support agroforestry, afforestation/reforestation and bioenergy projects, soil carbon conservation and REDD+ projects such as improved forest management, and introduction of efficient stoves and charcoal produced from sustainable organic materials like agricultural waste, rice and coffee husks, and invasive weeds.

www.unep.org/unite/30ways

www.cascade-africa.org

www.uneptie.org/energy/activities/cascade





▲ Heating up the renewable energy debate

Joint Geophysical Imaging (JGI) for geothermal reservoir assessment and the Africa Rift geothermal projects

"The study revealing the best well sites has reduced drilling costs and increased production. Initially, wells were shallow and produced between 1 and 5 MW but with UNEP's study we have been able to identify others that are much more productive. Now the average well is 3000 metres and produces between 5 and 15 MW."

Cyrus W. Karingithi, Assistant Manager, Resource Development, KenGen



THE PROBLEM:

Affordable, reliable energy is a powerful enabler of social and economic development, but high oil prices, drought, unprecedented population increase and healthy economic growth mean most of Africa faces an acute energy crisis. Located on the Great Rift Valley, Kenya boasts massive geothermal potential – as high as 7000 MW by some estimates – and is eager to make more use of this sustainable form of indigenous energy against a background of diminishing hydropower resources, unstable oil prices and dwindling biomass. But high up-front costs and the substantial risks involved in geothermal development have meant only a fraction of Kenya's geothermal potential has been exploited.

THE SOLUTION:

In 2002 UNEP began working with the National Power Generation Utility of Kenya (KenGen) on the Joint Geophysical Imaging (JGI) for Geothermal Reservoir Assessment project, with the aim of lowering geothermal development costs by improving the interpretation of geophysical data, so reducing the number of expensive, unproductive wells. At KenGen's Olkaria facility near Lake Naivasha in the Rift Valley, improvements in imaging and interpretation

have increased the chances of hitting steam, and made it easier to identify wells of high generation potential. Through its sustainable, value added approach, the project has helped technology transfer and capacity building by training KenGen scientists and technicians, and has managed to increase power generation and supply reliability while simultaneously reducing costs and benefiting the environment. Emissions of CO₂ from geothermal electricity plants are 2000 times lower than those from equivalent fossil fuel plants.

WHAT UNEP DID:

The JGI project improved geophysical data interpretation techniques and provided state of the art equipment for exploration, using Micro Seismic (MEQ) and Magneto Telluric (MT) surveys and analysis to identify promising new drilling sites. UNEP, with funding from the Global Environment Facility (GEF), contributed \$1 million towards total costs of \$2.7 million. Duke University of North Carolina, USA, collaborated on the project, which has resulted in substantial savings on proposed development of geothermal resources in Kenya, and there are plans to replicate this in the wider region. In addition, the project has provided sustainable capacity in these

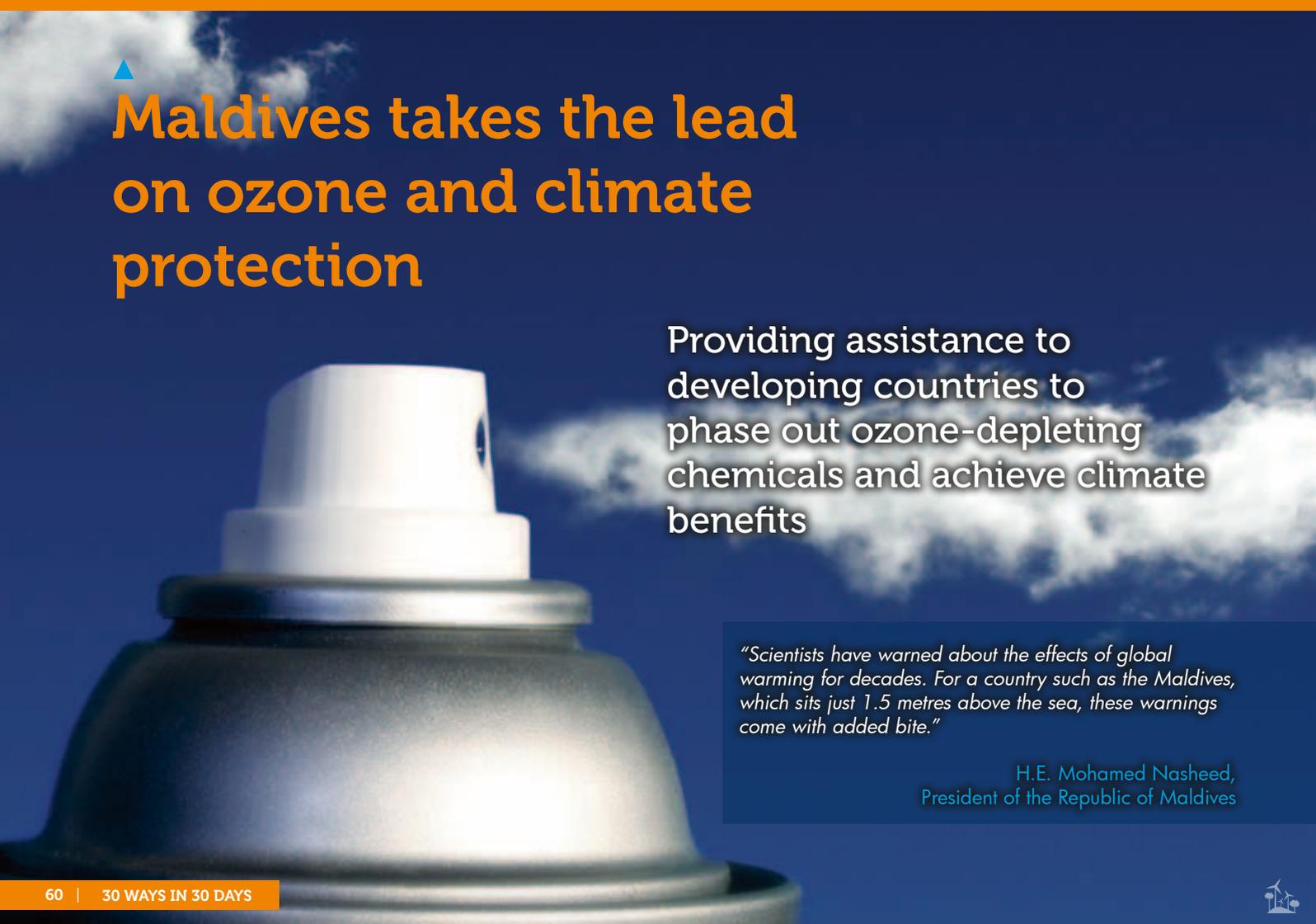
advanced techniques at KenGen's Olkaria facility.

THE BIG PICTURE:

The project has already shown its regional potential, with KenGen using its expertise to help Rwanda, Eritrea and Zambia assess and develop their geothermal resources. Since the JGI project has exceeded all expectations, UNEP and the World Bank initiated a regional project in six East African countries – Djibouti, Eritrea, Ethiopia, Kenya, Tanzania and Uganda – to tap into the Rift Valley's vast, unexplored geothermal potential. The African Rift Geothermal (ARGeo) project, supported by UNEP through a GEF contribution of \$17.75 million, will provide a platform for accelerated geothermal development and investment. Initial estimates are that these investments could lead to 891,458 tonnes of CO₂ emission savings per year, and up to 17.8 million tonnes over 20 years. It is expected that these pilot projects will generate additional interest in geothermal technologies and that this sustainable resource will be exploited in all of the countries that border the Rift Valley.

www.unep.org/unite/30ways
www.kengen.co.ke/index.php?page=business&subpage=cgeothermal
www.gdc.co.ke





▲ Maldives takes the lead on ozone and climate protection

Providing assistance to developing countries to phase out ozone-depleting chemicals and achieve climate benefits

"Scientists have warned about the effects of global warming for decades. For a country such as the Maldives, which sits just 1.5 metres above the sea, these warnings come with added bite."

H.E. Mohamed Nasheed,
President of the Republic of Maldives



THE PROBLEM:

The Montreal Protocol has been successful in phasing out the production and consumption of ozone depleting substances, in particular chlorofluorocarbons (CFCs) and halons, which, as of January 2010, are no longer produced. But some replacement chemicals such as hydrochlorofluorocarbons (HCFCs) – whose use is rapidly increasing in the refrigeration, foam, solvent, aerosol and firefighting sectors – while significantly less ozone-depleting than CFCs, have very high global warming potential, of up to 2000 times that of carbon dioxide.

THE SOLUTION:

Estimates suggest that phasing out HCFCs and their by-products could result in significant climate benefits – around 18 gigatonnes of CO₂ equivalent between 2015 and 2050. There is also an opportunity to gain significant additional climate benefits from improved energy efficiency and other replacement technologies. However, achieving these potential climate benefits depends on the replacement technologies selected, and can only be attained if low – or zero – global warming potential alternatives replace HCFCs. In September 2007 the Parties of the Montreal Protocol agreed to work towards phasing out HCFC production and consumption in developing and developed countries. This provided an historic opportunity for

governments and the private sector to engage in developing innovative technologies, and for developed and developing countries to engage in technology cooperation.

WHAT UNEP DID:

The Republic of Maldives is one of the countries at the forefront of this drive to embrace climate benefits through phasing out ozone-depleting substances. With the assistance of UNEP and UNDP, the country made an historic decision to phase out HCFCs by 2020 – ten years ahead of the Montreal Protocol phase out schedule – in line with the country's carbon neutrality policy and as part of a wider shift towards green growth and development. The Maldives developed the world's first national phase out plan, specifically targeting this group of chemicals, including a commitment to phase out HCFCs in air conditioning systems in nearly 100 tourist resorts dotted around the many islands that make up the Maldives. By leading the way in discontinuing the use of HCFCs early, the Maldives has shown that an early phase out is possible and practical, and it is hoped that other countries may follow this lead, to achieve climate and ozone benefits. Compared with a 'business as usual' scenario (which assumes a continued increase in HCFC usage of 8 per cent per year) this phase out could result in the prevention of emissions in the Maldives of up to 5.7 million tonnes CO₂ equivalent between 2013 and 2030 if low to zero global warming potential

replacements are adopted. The Maldives is a participant of UNEP's Climate Neutral Network (CN Net). CN Net has highlighted to a global audience the Maldives' initiatives to reduce emissions of harmful gases, and has encouraged others to adopt similar strategies.

THE BIG PICTURE:

The achievements of the Montreal Protocol over its 20 year history in phasing out the production and consumption of ozone-depleting substances are well known. So far the consumption of 98 per cent of all the chemicals controlled by the Protocol has been phased out, with the additional benefit of reducing greenhouse gas emissions. In its role as an implementing agency, UNEP OzonAction is assisting almost 100 countries to prepare HCFC Phase out Management Plans (HPMPs), with a focus on establishing accurate and comprehensive baseline data, and creating awareness about technology options and co-benefits with climate. UNEP also supports and promotes information sharing about non-HCFC technologies and policies through its Regional Networks, and is using its Information Clearinghouse and awareness raising activities to help developing countries control consumption of these harmful substances.

www.unep.org/unite/30ways
www.unep.fr/ozonaction
www.unep.org/climateneutral



▲ Getting solar panels out of hot water

Solar loans in the Mediterranean region

“Prosol’s success at replacing conventional energy with solar energy to heat water has also contributed to a decrease in state subsidies allocated to conventional energy.”

Noura Ben Laroussi Lazreg, General Manager,
ANME - Tunisian National Agency of Energy Conservation



THE PROBLEM:

While solar powered water heaters are an obvious energy saving solution in hot and sunny countries, the cost of buying them is prohibitive for many people. Banks often know little about this clean technology so loans are not widely available, even though a solar hot water system can pay back the investment in as little as four years, offering years of 'free' hot water after that. An average four person household with an electric water heater is responsible for producing about eight tonnes of CO₂ emissions annually – almost double that generated by a typical modern automobile – while a solar water heater can save the cost and emissions of 12 bottles of LPG every year.

THE SOLUTION:

The solar water heater market in Tunisia showed a dramatic increase when low interest loans were made available to householders, with repayments collected through regular utility bills. This reduced the risk for local banks, while simultaneously showing borrowers the impact of solar heating on their electricity bills.

WHAT UNEP DID:

Prosol – a joint initiative between UNEP, the Italian Ministry for Environment, Land and Sea, and the National Agency for Energy Conservation – has helped more than 105,000 Tunisian families get their hot water from the sun. Based on loans of over \$60 million, this represents a substantial leverage on Prosol's initial \$2.5 million cost. Its success has led the Tunisian Government to set an ambitious target of 750,000m² of solar panels for 2010-2014, a goal that would represent solar coverage comparable to that in Spain or Italy, with populations several times higher than Tunisia's. Many jobs have been created, as 42 suppliers and more than 1000 installation companies have sprung up to service the solar market. The tourism and industry sectors are also now involved, with 47 hotels engaged by late 2009, and there are plans to encourage industry to make greater use of the sun's energy. A project is now underway to make photovoltaic energy available to an additional 15,000 households in Tunisia through a similar loan and repayment scheme.

THE BIG PICTURE:

Around the world, demand for energy will continue to grow with population expansion and economic growth. Energy from renewable sources will be crucial. In Tunisia, the Government has encouraged solar energy by making solar water heaters eligible for the energy subsidy previously provided only to LPG. By 2008, Prosol had helped avoid 214,000 tonnes of carbon dioxide emissions, raising the prospect of Tunisia being paid for saved emissions under the Clean Development Mechanism. The project's success has spawned a solar water heating programme for homes in Montenegro, and EGYSOL – a project targeting the tourism and services sector in Egypt.

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UNEP's work on climate change

UNEP's vision and work on climate change

What if we could build green economies powered by clean energy? What if the most vulnerable communities were equipped with the resources to build resilience against extreme weather conditions? What if one of our planet's greatest natural carbon sinks – our forests – was managed as a critical long term sustainable resource, rather than a short term source of profit? And what if decision makers and the general public alike had better access to, and deeper understanding of, the latest climate science? UNEP is working to make this vision a reality.

With more than 20 years of experience working on climate action, policy and science, UNEP has implemented a range of climate change solutions that have led to proven policy shifts or results on the ground, showing that the costs of taking action are often much lower than inaction, while bringing multiple benefits for communities and ecosystems. UNEP's work on climate change is shaped by the negotiations under the United Nations Framework Convention on

UNEP supports countries to develop REDD strategies and to test innovative REDD pilot projects, including consideration of co-benefits such as biodiversity and livelihoods in REDD strategy and action.

Climate Change (UNFCCC) and tailored to the needs of Member States and a growing number of requests on how best to realize a green economy for the 21st century.

UNEP is helping countries to strengthen their resilience to climate change, move towards low carbon societies, reduce emissions from deforestation and forest degradation, and improve understanding and awareness of climate science. To support the achievement of these goals, UNEP has three main priorities, that match the organization's skill set, experience and mandate to the needs of developing countries: ecosystem based adaptation, clean tech readiness, and REDD+.

Resilience to a changing climate

Ecosystem based adaptation

Climate change is affecting the functioning and integrity of ecosystems and challenging their capacity to provide all the services upon

which a multitude of sectors, communities and people depend. Healthy ecosystems are essential for sustainable economic prosperity and provide defence against the negative effects of climate change.

Because investing in adaptation solutions based on the use of ecosystem services is one of the most effective ways to address the multiple challenges of vulnerability and poverty, UNEP focuses on ecosystem based adaptation (EBA). UNEP is helping vulnerable communities adapt to climate change through good ecosystem management practices, and their integration into climate change strategies and development plans, with particular attention on Africa, Small Island Developing States and mega-deltas. UNEP works with countries to assess vulnerabilities, develop policies, and incorporate cost effective preventative actions into national development processes. As a Multilateral Implementing Entity under the Adaptation Fund, UNEP supports countries in developing regions and presents concrete

As a science based organization, UNEP works to provide relevant climate change science and information for decision making to national policymakers and negotiators, major groups, civil society and the private sector.



adaptation priorities to the Fund. UNEP (with UNDP and the World Bank) also aims to support countries in establishing their National Implementing Entities to facilitate direct access to the Adaptation Fund.

Low-carbon growth

Clean tech readiness

Investing in low carbon energy alternatives and reducing emissions from inefficient energy use offer the best ways to achieve immediate and sustained reductions in greenhouse gas emissions. UNEP is helping countries to assess emissions reduction opportunities and make sound policy, technology and investment choices that promote clean and renewable energy sources and energy efficiency. UNEP is also taking action to stimulate private sector involvement, and to phase out obsolete technologies and deploy cleaner ones.

Many developing countries and countries in transition are ill equipped to choose and adopt new and more efficient technologies and so are at risk of missing the energy

UNEP helps countries reduce their vulnerability and use ecosystem services to build resilience against the impact of climate change.

revolution. UNEP has chosen to focus its work on clean tech readiness, and works with countries to ensure that information, policy and financial barriers to low-carbon and efficient energy technologies are removed, positioning these cleaner alternatives as the foundation of national economies. Helping countries develop low-carbon growth strategies and plans is an important element of this support.

Reducing Emissions from Deforestation and Forest Degradation (REDD)

REDD+

The forest sector accounts for about 17 per cent of global greenhouse gas emissions, mainly through deforestation. In addition, the combined ecological services from forests, including carbon sequestration, are worth billions – perhaps trillions – of dollars to local and global economies annually.

Since succeeding with REDD is vital for the effectiveness of any future climate agreement, UNEP – in partnership with the United Nations Food and Agriculture Organization (FAO) and the United Nations Development Programme (UNDP) – has created the UN-REDD programme to help countries develop national REDD strategies, finance approaches

and support institutions. The core of UNEP's REDD activities is reducing emissions while generating hundreds of millions of dollars that could be used by communities to improve management of forests, shift the forest sector to alternative development pathways, and support biological diversity and livelihoods.

Through its REDD+ work, UNEP is helping countries make the case for REDD, developing transformative national strategies to address deforestation, conducting financial assessments, and leveraging additional investment – all aimed at reducing the rate of carbon loss from land-based activities.

Understanding and awareness of climate science

UNEP's science and outreach programme focuses on improving understanding of climate change science and its use in sound policymaking, and on increasing general awareness and comprehension of climate change issues by communicating key messages.

Drawing on its strengths as a science based organization, UNEP works to ensure that national policymakers and negotiators, major groups, civil society and the private sector have access to relevant climate change science and information. With diverse collaborating



UNEP supports countries to make the transition to low carbon growth and green economies by promoting access to finance and scaling up clean and renewable energy sources, energy efficiency and conservation.

partners, UNEP facilitates the development of climate change data, climate impacts research, communication tools, information, and assessments to inform climate change policies. UNEP also supports countries in building capacities, enabling them to develop their own expertise. In addition, as part of its support to the UNFCCC process, UNEP is providing support to climate negotiators by organizing regional workshops within the framework of the negotiations.



UNEP'S WORK ON CLIMATE CHANGE

	MENU OF SERVICES	SUCCESS STORIES
<p>■ Resilience to a changing climate</p> <p>Ecosystem based adaptation</p>	<ul style="list-style-type: none"> • Conducting impact and vulnerability assessments • Assessing adaptation opportunities • Implementing adaptation measures • Integrating adaptation into policy and planning <p>➤ Focus on building resilience through Ecosystem Based Adaptation (EBA) measures</p>	<p>↓</p> <ul style="list-style-type: none"> • Rehabilitation of Water Reservoirs in Togo • Ecosystem restoration of lake Faguibine, Mali • Supporting countries to access the Adaptation Fund
<p>▲ Low-carbon growth</p> <p>Clean tech readiness</p>	<ul style="list-style-type: none"> • Assessing and analysing emissions reduction opportunities • Deploying clean technologies • Stimulating public and private sector involvement <p>➤ Focus on facilitating "readiness" for mitigation, removing barriers for planning, financing and deploying efficient technologies</p>	<p>↓</p> <ul style="list-style-type: none"> • Indian solar loan programme • Capacity development for CDM • PROSOL • Technology Needs Assessment
<p>● REDD</p> <p>REDD+</p>	<ul style="list-style-type: none"> • Making the case for REDD: Showcasing of best practices and learning from countries participating in REDD • Developing transformative national strategies to address deforestation • Conducting financial assessment and leveraging additional investment <p>➤ Focus on REDD+ readiness and implementation</p>	<p>↓</p> <ul style="list-style-type: none"> • The African Carbon Asset Development Facility • UN-REDD support programme in nine countries (incl. DRC and Vietnam)
<p>◆ Understanding and awareness of climate science</p>	<ul style="list-style-type: none"> • Scientific support: Development of scientific information and supporting development of capacities for national climate science • Climate negotiations support • Communication and outreach <p>➤ Focus on providing decision makers, their advisers, and the public with access to climate change science and information</p>	<p>↓</p> <ul style="list-style-type: none"> • UNEP Yearbook • Climate Neutral Network • Billion Tree Campaign • GHG "Gap" Analysis • Assessment of black carbon and ozone





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