


Climate Finance Works







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Preface

The countries of Europe have maintained significant momentum in delivering climate finance and other assistance to developing countries across the globe. Europe has been at the forefront of taking decisive and far-reaching actions against greenhouse gas emissions while also assisting developing nations to gain access to energy, repair environmental degradation, and improve energy efficiency. Whether it is a financial institution, a government agency, or a social enterprise, European support of low-carbon, climate-resilient development activities around the world is truly inspiring. These initiatives are helping to limit the world's greenhouse gas emissions while also providing social benefits; economic growth; and access to sustainable, clean energy. Myriad climate finance success stories exist, and Climate Finance Works has assembled some of the most compelling ones that have, so far, not received the attention they merit.

In Climate Finance Works, readers will find vignettes of situations where European funding has supported mitigation actions in developing countries. These projects are the seeds of change that are germinating around the world. As future financing flows, other such projects will grow and help create a fertile field that makes a difference when it comes to carbon.

Some people may argue that the real climate finance has not even started yet — the Green Climate Fund has still to be set up — but the movement to take action to mitigate greenhouse gas emissions in many developing countries has been surprising. In recent years, many countries of the South have reevaluated their own interests and realised that ever higher levels of conventional energy consumption come at high societal costs. These countries are beginning to express a preference for cleaner and lower-intensity energy and economic growth. This change of perception has been triggered in many cases by projects that have been implemented only with financial aid from Europe — whether through development aid, private investments via the Clean Development Mechanism, or simply by a workshop or conferences funded by Europe.

Sources of climate finance come from both the public and the private sectors. A 2011 report by the Climate Policy Initiative indicates that global climate funding in 2010 totaled 70 billion Euros. While the poorest countries rely on development banks, private-sector funding is flowing strong, through capital investments and capital markets that support low-carbon development.

The three country chapters — on China, Mexico, and India — offer a broad sampling of finance flows and policy measures that have supported sweeping mitigation efforts. The European money flow to these countries does not resemble a wide-rushing river. Rather, it is more like an expansive delta of streams that include a range of loans, financing mechanisms, carbon offset flows, grants, and policy support that sustain striking examples of programmes already in action.

The Snapshot section focuses on how finance and policy themes have merged to implement programmes in various sectors, such as solar energy, cooking, and transportation. Important factors for these investments include the ability to reach scale quickly.

Developments under Fast-Start Finance and Prospects for the Future, which highlight large projects making advances toward climate change mitigation, are momentous because they lay out details of important groundwork for the sweeping changes to be supported by the developed economies of the world.

In recent years, Europe has planted and watered many types of seeds across the globe, creating diverse sets of low-carbon development activities of different sizes and scales, and tailored to the capacities of the local environments. As we enter a new season — to begin sowing, cultivating, and reaping the much larger-scale mitigation opportunities that come with significantly enhanced levels of international financial, technological, and capacity support — it is time to learn from our past experience to plant the best seeds and offer the best machinery and know-how to green ever-larger swaths of the globe, all the while bearing in mind the changing environment and development conditions and goals in each region. This report, Climate Finance Works, seeks to show how international assistance can produce meaningful climate actions and limit emissions in developing countries while also supporting sustainable economic growth and development.

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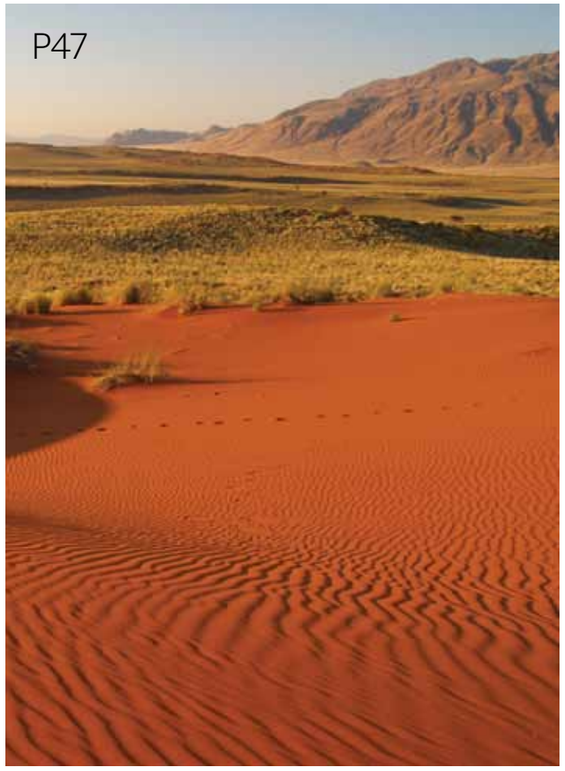
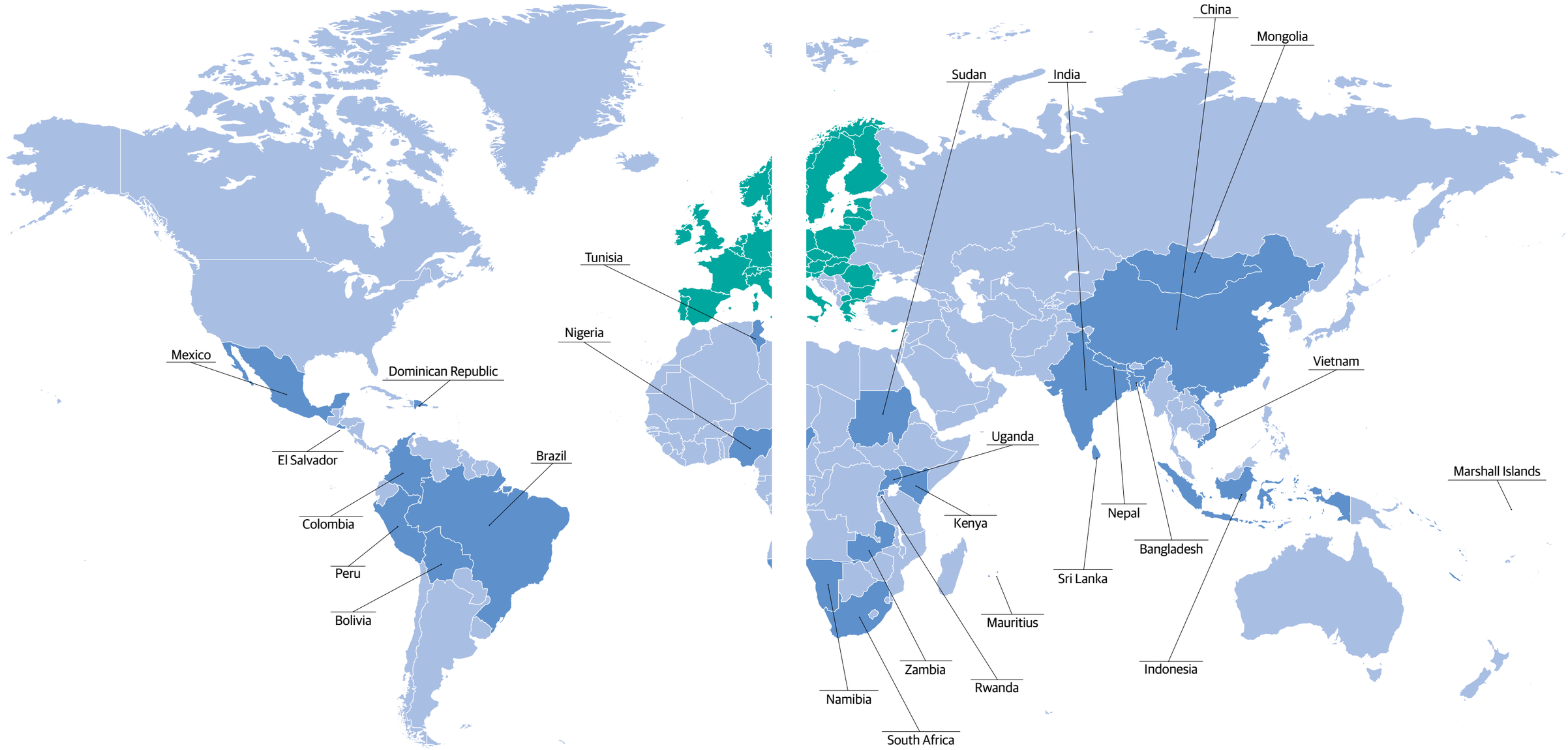


Climate Finance Works

Climate finance is occurring in many locations around the world.



Climate Finance Works features over 40 success stories of low-carbon, climate-resilient development activities with funding by Europe in 27 countries around the globe.

Key

- Donor countries of Europe
- Host countries receiving climate finance

Planning for change

Low carbon development and ambitious new targets set the stage for reductions in energy and carbon intensity

In March 2011, the Chinese government set the low carbon economy as one of its strategic goals for economic development. Starting and growing low carbon and clean energy industries has become one of the strategic centerpieces of the Central Government's 12th Five-Year-Plan, which runs from 2011 to 2015. To reach these targets, ambitious mitigation actions are foreseen in many sectors of the Chinese economy with a particular focus on controlling greenhouse gas emissions from industry, building, transport and agricultural sectors.

"Nobody knows how decision making in Chinese politics works. Perhaps the Chinese government would have come to the same conclusions without dialogues and substantive support from Europe," said Shinwei Ng, China expert of the environmental think tank E3G, of London. "But certainly all the ongoing talks and financial support from Europe for strategic projects have increased the speed of this process."

Only five years ago environmental protection and low carbon development were seen by many Chinese officials as obstacles to the economic development of China. This has changed profoundly.

Through channels of finance, Europe helped accelerate China's adoption of climate change mitigation policies and measures to improve their understanding of how to access climate financing. "The Clean Development Mechanism certainly played a catalytic role. It kick-started the enthusiasm of the industry," said expert Ng. The private sector in China understood quickly that huge money can be made with CDM projects. (See separate box on the Clean Development Mechanism.) And these voices from the private sector convinced China to see low carbon development as an opportunity. More than 1,500 CDM projects are registered in China to date, which makes the country by far the largest recipient of sellable Certified Emission Reductions. Several hundred private sector actors in China have benefited from this mechanism, which is sustained mainly by the need of European industries for emission allowances. With some of the investments, China is gaining access to advanced technologies through the sale, licensing, or joint venture agreements in these CDM projects. Many CDM projects brought exactly this: the opportunity to invest and employ the most advanced technologies that decrease not only emissions but also costs.

The European Commission also built capacity within China through funding a Center for Clean Air Policy Europe-led study on sectoral approaches in key industry sectors, which assessed a range of policy options for reducing carbon emissions from key energy intensive industries, including data challenges and other barriers to implementation. This in-depth work with Tsinghua University and Chinese industry leaders built on an earlier CCAP study that created the first comprehensive analysis of greenhouse gas reduction options for the cement, steel, and aluminum industries in china. This work was funded by the Department for International Development of the United Kingdom and developed similar analyses for Brazil, India, and Mexico as well.

Similarly, important dialogues and pilot projects were brought forward by the international institutions of many European Member States. Germany, Italy, Sweden, and the United Kingdom were also major contributors to the greening of China. For example, the British Foreign & Commonwealth Office (FCO) conducted and supported a series of projects on low carbon policies. Among the topics were low carbon zones and low carbon cities. "In the beginning the reaction of our counterparts in China were quite reluctant but this changed dramatically within years," remembered Ng. Funded by the FCO, the think tank E3G, Chatham House, Jilin University and the China Academy of Social Sciences developed a "Low Carbon Roadmap for Jilin City," which was published in early 2010. The roadmap included a low carbon development pathway for Jilin City with its population of 4.5 million people. It conducted a needs assessment, energy scenario modeling, and a list of practical recommended investments with associated carbon emissions reductions. The roadmap was highlighted by Chinese authorities as an example for other cities to follow. The cost of this project was quite limited – 218,000 UK-pounds – but the positive impact was great and other cities quickly followed suit. The new 12th Five-Year Plan, adopted in early 2011, decided to set up "low carbon zones" in China in eight cities and five provinces with more than 300 million inhabitants.

The new five-year plan also envisions a large number of new targets and measures to increase energy efficiency, increase proportion of non-fossil fuels in energy consumption and reduce carbon intensity. The energy intensity will be reduced by 16 percent by 2015 and the carbon intensity by 17 percent, relative to 2010 levels. The percentage of fuel sources represented by non-fossil fuels will be expanded from 8.3 percent today to 11.4 percent in 2015.

For many of these policy areas China is looking towards Europe for leadership in identifying the most cost-efficient instruments. Between 2006 and 2010 China implemented its Top 1000 Enterprise programme to help meet the Central Government's 11th Five Year Plan energy intensity target. The programme set energy-saving targets for the nation's 1000 largest state-owned enterprises, consuming one-third of the nation's energy. The Central Government mandated all participating enterprises to negotiate with Provincial and local authorities to set a target to reduce the energy consumption per produced unit. Incentives and penalties were allocated in coordination with the provincial evaluation system to ensure enterprises achieved their targets.

To date, this programme has been one of the most successful mitigation actions in China and reached its goal to save 130 million tonnes of coal equivalent almost within the first three years. The concept of this programme resembled similar models in the Netherlands and in the United Kingdom, which were implemented before these countries became part of the European Union Emissions Trading Scheme.

Four years ago the finance sector in China was not at all prepared or willing to lend money to finance investments in energy efficiency. Chinese banks had no business models and no interest in the sector at all. International development banks – which also are supported by Europe – and the French Agence Française de Développement (AFD) set up special programmes to support Chinese banks to fund energy efficiency measures under the Top1000 Enterprise program. They also included training on how to set up a loan business in this special field. These programmes supported by finance with at least partly European origin were helpful in making Chinese banks realise that efficiency programs can indeed be an attractive new business opportunity for the climate financing sector. (See separate box on Top1000 Enterprise programme and loan programmes.) At the same time the Chinese government urged the Chinese banks to drastically increase finance for efficiency measures. Within only a few years Chinese banks developed a significant business presence in this field. "In 2010, Chinese banks loaned the equivalent of almost $20 billion (US) to customers for energy-efficiency projects, more than 10 times what they loaned in 2004," estimated experts of the Energy Transition Research Institute. This amount is still not enough to ensure that China will reach its efficiency targets, as the institute estimates that US$90 billion would be needed, but it represents a good start on financing efficiency efforts.

To achieve the efficiency target of the 11th Five-Year-Plan between 2006 and 2010, the Chinese Central-level authorities imposed drastic measures on local authorities and companies. Local officials were promoted only when they could show improved efficiency gains. Many old factories and power plants were simply ordered to close down. For example during this period, 70 gigawatts worth of inefficient power plants were ordered by the authorities to shut down. This is equivalent to shutting down the entire British generation fleet. In some instances rumor has it that even the power supply for complete regions was temporarily closed down to achieve the targets.

The 12th Five Year plan is drastically expanding the reach of China's mitigation policies to include all sectors of the economy. Instead of the thousand biggest emitters, the new plan introduces a 10,000 Enterprises programme with details to be determined. This might also involve airports or other big infrastructure providers, for example, with very complex emission profiles for which standards are very complicated to set.

It is very unlikely that such a huge number of players with very diverse emissions profiles could be controlled by traditional central command and control policies. Therefore, China is looking closely at market instruments. The 12th Five-Year Plan also alludes to the establishment of guidelines to price pollution emissions and carry out emissions permit trading. A section of the Plan specifically says they will "gradually [set up a] a carbon emission trading market", as part of the government's to-do list. Already, Chinese officials have announced the location of pilot emissions trading programs (five provinces and eight cities) and are actively soliciting proposed designs, and one senior official announced that a national trading platform will be established by 2015. Again, the most compelling example is Europe's Emission Trading System with its many strengths and learned lessons. Many European-funded projects ensure that the Chinese have a chance to get acquainted with the possibilities of emission trading.

The interesting side effect of these cap-and-trade programs is that they most likely imply a cap on the emissions in the regulated sectors. This would be a huge step for Chinese climate policies, which, up to now, have tried to avoid any absolute cap on emissions because it could be seen as an obstacle to further development. While there is particular interest among Europeans in advancing their own cap-and-trade approach, the UK FCO has also supported efforts by the Center for Clean Air Policy and Tsinghua University to educate Chinese policy makers on other market-based designs, including intensity-based trading systems that are more consistent with China's own intensity targets. The CCAP effort also examined creating an emissions trading program to promote efficiency improvements in the building sector for the city of Xiamen. Such approaches are particularly advantageous to fast-growing industry sectors such as iron and steel and electricity.

In many policy areas regarding renewable energy and efficiency, Chinese policies are already now overtaking those of many developed countries. For example, the Australian Climate Institute found that today the incentives for low-carbon power generation in China are almost triple those in the United States. "China is leading and taking responsibility," said Climate Institute's Deputy CEO Erwin Jackson. "They are doing it because it's in their economic interest." China has simply identified the growing global market for renewable generation as an opportunity to strengthen their export industry. Currently, China holds the largest installed capacity in renewable energy (including hydropower), and ranks highest in installed wind power and solar hot water capacity.

All these examples demonstrate that Europe, with its targeted projects and financial support, has clearly made a difference in China. Within a few years there has been a remarkable shift in that Chinese leaders now see reducing emissions as an opportunity. However, all these projects have not yet substantively changed the Chinese emission patterns on the ground. Chinese emissions are still growing. "There is still a huge challenge," said expert Ng. "There have to be new instruments and mechanisms to really reach out to the private sector in China and make it change. Certainly Europe is in the ideal position to be a very influential partner." China and Europe together could create huge markets for climate-friendly products and set emission standards that would quickly become influential in other parts of the world.

Village curbs dependence on coal

Solar stoves capture the sun's energy for cooking, reducing coal use by 20 percent for residents in a small rural town in northwestern China.

The arid part of southern Ningxia is one of the poorest regions in northwestern China. Cooking meals and heating water can be a sooty, expensive, and time-consuming task for rural inhabitants. The region has experienced desertification, and a shortage of wood for fueling cook stoves. To get fuel for their coal-fired stoves, villagers must travel 20 to 30 km to purchase it from the nearest coal dealer.

Now, 17,000 households, or 20 percent of residents, cook with a stove that uses no fuel and costs nothing to operate. The Haiyuan Solar Cooker captures sunlight to heat food and water. Each solar cooker has a power rating of 773.5W, and a total installed capacity of 13.1MW. The solar cookers project led by the Ningxia Federal Intertrade Co., a social enterprise, replaces coal consumption and reduce 33,500 tonnes of equivalent carbon dioxide (CO2e) emissions per year. The project is a CDM project of the Swiss-based myclimate and is validated under the Gold Standard. Overall it will provide 368,500 Euros annually in financing based on a rate of 11 Euros per tonne. The European carbon market is the biggest buyer of CERs generated from CDM projects. The Haiyuan Solar Cooker Project was designated as a Gold Standard project because it generates renewable energy and also contributes to the social well-being of residents in the local villages.

PROJECT: Haiyuan Solar Cooker Project
DONOR: Clean Air Trade
HOST COUNTRY: China
SECTOR: Thermal energy
CO2E REDUCTIONS: 33,500 tonnes annually
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CDM in China **Through a global lens**

Emissions reduction projects in 73 developing countries around the world are earning UN-approved greenhouse gas (GHG) emissions offset credits. Under the UN Clean Development Mechanism, countries combating climate change can earn tradable CER credits that they can trade. When sold, these credits are used by industrialized countries to meet emissions reduction targets set forth under the Kyoto Protocol. The mechanism has two goals: It stimulates sustainable development while delivering verified and transparent reductions in GHGs for industrialized nations. All CDM projects must qualify through a rigorous and public registration and issuance process designed to ensure real, measurable and verifiable emission reductions that are additional to what would have occurred without the project.

This cooperative mechanism allows for picking the low-hanging fruit of easy emissions reductions because the overarching philosophy of CDM is that one tonne of GHG reduced anywhere in the world has the same effect on the climate. As such, the least costly emissions reductions options should be financed first.

Approximately 3,500 CDM projects are now registered and qualify as CERs, with 5,600 in the pipeline. By the end of 2012, approximately 2.7 billion tonnes of CO2e will be reduced through projects under the CDM. In 2010, 1.44 billion Euros were spent in Europe's carbon market.

China currently holds 63 percent of annual CERS in the world, which is a testament to the success of CDM in China. In Asia alone, China has submitted 52 percent of total CDM projects and is projected to have the largest potential for generation of CERS by 2012. While European companies have purchased a large share of the carbon credits available through the CDM to date, post 2012 a change in direction on support for the CDM in Europe is likely. The EU Emissions Trading System (ETS) is likely to limit CDM support to projects coming from least developed countries. The European Commission and many European nations are already active in supporting the development of nationally appropriate mitigation actions (NAMAs) in developing countries, basically policies that reduce GHG emissions and promote sustainable development in key sectors like electricity, cement, steel, and urban transportation. For example, a country could establish a NAMA that calls for meeting a set percentage of electricity from renewable energy. Europe's investment in NAMAs will help developing countries contribute to the global effort to hold temperature increases to 2 degrees Celsius. The resulting emissions reductions are counted against the developing countries' emission reduction goals and are not used to help developed countries meet their targets. Only when developing countries exceed the agreed emissions reductions goals of these new policies (for example, exceed the percentage requirement for electricity from renewable sources) would the EU ETS possibly award carbon credits.

Policy, finance become catalyst for change

Global Environment Facility effort attracts US$150 million worth of investment in energy-saving technologies for township and village enterprises

A main target for the reduction of greenhouse gas emissions over the last decade has been the 23 million township and village enterprises in China, which account for 30 percent of the country's gross domestic product (GDP) and provide jobs for 143 million laborers. These enterprises produce building materials, such as cement, brick, coking, metal casings; they are also major polluters and account for one-sixth of China's CO2 emissions.

A UN-led effort laid the groundwork for the modernisation of these rural, industrial enterprises in 1998-1999 (Phase I). The project examined improvements that were required in efficient energy use and the reductions of emissions through conservation, technological innovation, financing, policy, and quality improvements. In 2001, the GEF began the second phase of the project, which spanned six years and led to reductions of 1.3 million tonnes of GHG emissions annually.

In this second phase, the GEF invested US$8 million, and the Chinese Ministry of Agriculture invested US$10.5 million. The project also inspired these rural businesses to invest more than US$150 million of their revenue back into energy efficiency technologies.

What set the stage for change? A convergence of government policy, new access to finance, and removal of technology and policy barriers influenced the catalytic actions coordinated by the GEF. New laws were adopted that governed waste, pollution, and water and energy conservation, among other critical environmental safeguards. For instance, a new technology center in the Shenhe cement plant reduced waste heat, which resulted in a new design code for cement plants. At the same time, a market-oriented approach had emerged, in which businesses identified energy efficiency projects in township and village enterprises and disseminated energy-efficient technologies to those areas. Former commune-based operations with low-grade technologies upgraded their manufacturing and industrial systems when they had access to new technology and the financing to buy it through local lenders.

PROJECT: Energy conservation and GHG emissions reductions in China's township village enterprises, Phase II
DONOR: GEF, which receives more than a third of its funding from Europe
HOST COUNTRY: China
SECTOR: Energy efficiency
INVESTMENT: US$8 million
CO2E REDUCTIONS: 1.3 million tonnes annually

France takes aim at low-carbon housing

Investment in efficiency reduces household energy use by 50 to 70 percent

Urban areas in China are experiencing an unprecedented housing boom. Commercial and residential development projects in China account for 50 percent of global construction. This has led to a dramatic rise in energy consumption and air pollution. Since 1999, the French Global Environment Facility (FGEF) has worked toward improving energy efficiency in China's housing sector in three provinces: Heilongjiang, Beijing and Shanghai. As a result of FGEF investment of 5.9 million Euros between 1999 to 2009, 44,000 tonnes of CO2e have been saved annually, approximately a 50 to 70 percent reduction in energy use.

In addition, AFD has financed projects in China that reduce greenhouse gas emissions from home heating. In Shanxi Province, a major coal center and an area with the thirty most-polluting cities in China, the 3.5 million residents who live in the city of Taiyuan rely on old, small and inefficient coal heaters for their homes. AFD has helped the city link residences to a highly efficient coal-fired heat and power system, which will reduce annual carbon emissions by 500,000 tonnes.

PROJECT: Low carbon housing
DONOR: France
HOST COUNTRY: China
SECTOR: Housing
INVESTMENTS: 5.9 million Euros plus additional financing from AFD
CO2E REDUCTIONS: 500,000 tonnes
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Landfill methane becomes alternative energy source

Swiss company develops carbon management for landfill-gas energy project for China's "Venice of the East"

One of China's top tourist destinations, the ancient city of Suzhou, in the Jiangsu province of eastern China, is often called the "Venice of the East". The city is located in the middle of the Yangzte Delta and is known for its classical gardens, canals, silks, operas and museum, among many other cultural attractions. Suzhou is a major population center – 6 million people reside there. The area's landfill quickly became overburdened and was a major disturbance to the city's inhabitants. Plus, the landfill released methane, a potent greenhouse gas that is 21 times stronger than CO2.

Reductions in these greenhouse gas emissions were achieved when the project builder installed pipes deep underground and circulated gas for processing. Incineration units burn the gas, and the gas pressure moves turbines that create electricity and hot water, for a total installed capacity of 5 MW. This energy is then fed into the local grid.

"The air quality could be very bad prior to the landfill gas program, especially when facing unfavorable weather," one resident said. "But now the situation has changed. We no longer sense such strong bad smells." The project avoids both emissions of sulfur and methane into the atmosphere. In addition, a park was built over the landfill, transitioning the place into a new area for recreation, rather than a place to avoid.

Because the project owner, though Chinese, is administered by a foreign entity, it did not qualify as a CDM project; Chinese rules do not allow foreign-owned entities to receive CERs. So, South Pole Carbon Asset Management Ltd., of Switzerland, advised the project owner to develop the landfill gas project as a voluntary project under the Gold Standard, the world's strictest carbon standard with an eye on sustainable development. The Swiss company organised all aspects of the carbon management from their Beijing office, from documentation to registration, from installing monitoring systems for measuring reductions to sales of the issued carbon credits.

The Suzhou landfill gas project produces energy for the electricity grid, reducing 130,000 tonnes of CO2e annually. Based on a price of 11 Euros per tonne, the emissions reductions have a value of 3.42 million Euros. Caspar Chiquet, of South Pole Carbon Asset Management, confirmed that all 312,000 credits issued so far have already been sold to the European market.

PROJECT: Suzhou Landfill Gas Energy
DONOR: Switzerland, EU
HOST COUNTRY: China
SECTOR: Energy
CO2E REDUCTIONS: 312,000 tonnes
PHOTO CREDIT: South Pole Carbon Asset Management
PRESS CONTACT: Max Zeckau; South Pole Carbon Asset Management
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UK plants seed for low-carbon thinking

New plan creates roadmap for reducing carbon intensity for Jilin City by 58 percent.

Sometimes, it only take a few seeds to grow a field. Such is the goal of the United Kingdom Foreign and Commonwealth Office plan to support low-carbon, high-growth strategies in China. Called the Prosperity Strategic Programme Fund (SPF), the plan consists of climate change, energy, financial reform, economic rebalancing, and business environment policy areas that will be developed in partnership with Chinese public and private sector stakeholders to foster low-carbon development.

One example of this programme's success can be seen in Jilin City, which has population of 4.5 million. SPF helped support the "Low Carbon Development Roadmap" for Jilin City, published in early 2010. It was a pioneering collaboration between top academics from Jilin University, renowned Beijing institutions including the China Academy of Social Sciences and the Energy Research Institute of China's National Development and Reform Commission, and UK-based NGOs Chatham House and E3G. The roadmap proposes an improvement in carbon intensity for Jilin City by 58 percent in 2020, compared to 2005. If this is achieved, carbon emissions will be 19 percent lower in 2020 than business as usual.

Other successful programs are sprouting up throughout China. For instance, in Guangdong, SPF is working to develop a policy roadmap to enable it to become one of China's pilot low carbon provinces; and in Chongqing, SPF funds are being used to support policy planning for low-carbon development in western China's hub of economic growth.

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France gets serious about green growth

AFD partnerships with local banks helps domestic finance flow

China is getting serious about green growth and may soon overtake the European Union as a front-runner in low-carbon development investments. New financing mechanisms to fund efficiency measures and innovative policies that support renewable energy and low carbon zones are helping drive China's progress in this field.

France is one country that has introduced China to new forms of low-carbon financing. In 2008, the French development agency Agence Française de Développement (AFD) supported China's effort to reduce its carbon intensity by allocating 60 million Euros to three local banks to finance sustainable energy investments. This commitment by AFD helped spur new climate financing mechanisms, loans with technical assistance to build capacity, and financing for partner banks. It was also supported by the French Global Environment Facility.

AFD's programme was so successful that it supported 15 projects in China, for a total investment of 250 million Euros in areas such as heat recovery, energy yield enhancements in power plants, energy efficient housing programs, and renewable energy production. In total, these projects have reduced emissions by 1.9 million tonnes of CO2e each year. In 2010, AFD renewed the programme with a credit line of 120 million Euros.

Financial mechanisms such as green credit lines have become a large portion of AFD's portfolio to combat climate change. Last year, these credit lines exceeded 1 billion Euros worldwide, tripling since 2007. By partnering with local banks, AFD has been able to leverage financing so that it can reach scale. For China, these credit lines mean that local banks can now finance small scale local investments, lend in local currency, and identify and pursue sectors with the highest potential to reduce carbon emissions.

PROJECT: Green Credit Line
DONOR: France
HOST COUNTRY: China
SECTOR: Banking
INVESTMENT: 180 million Euros by AFD; 250 million Euros in co-financing
CO2E REDUCTIONS: 5 million tonnes in 2010
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Making progress in Mexico

Six years ago, Mexico began a journey to transform its national policies for economic development while also taking responsibility for its growing greenhouse gas emissions. That series of thoughtful policies, strategies, and programmes was successfully implemented. Now, Mexico has laid a strong foundation for building a low-carbon economy that supports climate change mitigation efforts and economic prosperity. The world's lens is now focused on Mexico's low-carbon evolution, because leaders are trying to learn lessons they can apply to their own sustainability solutions.

For Mexico, it all began with the creation of the Inter-Ministerial Commission on Climate Change in 2005. The National Strategy on Climate Change followed, in 2007, to inform how the country could take action on greenhouse gas mitigation and climate change adaptation. This body of knowledge found its way into the National Development Plan for 2007 to 2012, which included both sustainability and climate change as main pillars for development. In 2009, then, it was no surprise that the Special Programme on Climate Change (PECC), for years 2009 to 2012, was not only idea-rich but also took into account goals, emissions targets, and actions for climate change mitigation and has since achieved international prominence. Mexico's submission to the Copenhagen Accord went even further than the PECC, increasing its economy-wide mitigation commitment from a 20 percent to a 30 percent reduction from BAU in 2020.

Mexico expects the full implementation of its special climate change programme will achieve an emissions reduction of 51 million tonnes of CO2e in 2012 (below the business-as-usual level). The PECC contained hundreds of actions and was designed to show that a developing country can address climate change without hurting the economy. Considering the state of world financial resources, this effort couldn't happen at a more opportune time for Mexico, which has both a growing economy and growing emissions. In 2010, Mexico was ranked the 12th largest economy in the world and among the top 15 globally in carbon emissions.

"There is a huge potential for green growth in Mexico," said Fernando Tudela, deputy secretary for environment and planning at SEMARNAT, Mexico's Ministry of the Environment and Natural Resources, in an interview with USAID. "We would like to prove that a developing country can mitigate and adapt to climate change without hurting the economy. We want to prove that in Mexico."

A law in 2008 enhanced government authority to support renewable energy in Mexico. Called the Law for the Use of Renewable Energy and Finance of the Energy Transition (LAERFTE), it further expanded the role of the Energy Regulatory Commission to include enhanced oversight of the renewable energy sector and coordination with the Ministry of Energy to develop a plan for the contribution of renewable energy to the national electricity system. In June 2011, LAERFTE was modified. Now the target is to have 35 percent of electricity generation capacity in 2025 using clean, nonfossil fuels, up from the current clean energy capacity of 29 percent of total electricity generation.

Rules to encourage renewable energy use by self-suppliers and independent power producers were also modified. This, along with financing from the GEF to provide 1.1 cents per kWh incentive to wind producers and financing through CDM projects, helped jump-start interest in wind development by the private sector, particularly in high wind areas of the country. As of October 2011, Mexico had 524.5 MW of wind power in operation and an additional 1,469 in different stages of construction that will come into operation between 2011 and 2013. In addition to continued development by the private sector, over 1,200 MW of wind energy will be installed between 2013 and 2016 under the national energy utility's latest expansion program.

Financing flows to support renewable energy development can help industrial sectors contribute to these ambitious targets. An interesting example of this is cement manufacturing. Although the Mexican cement industry is among the most energy efficient in the world, it still has some significant greenhouse gas mitigation opportunities.

CCAP is working with the Mexican cement chamber, CANACEM, on the development of two plans for Nationally Appropriate Mitigation Actions (NAMAs) for the cement sector (for more on NAMAs, see "Donor darling"). One NAMA will achieve greater use of alternative fuels, including the substitution of lower-carbon fuels, such as municipal solid waste and tires, for fossil fuels. The other NAMA lays out a plan for increased production of blended cements, which involves the substitution of fly ash, blast-furnace slag or natural pozzolans for clinker (the primary component of cement), the production of which is responsible for the vast majority of GHG emissions from this sector. "These NAMAs will involve implementation actions by specific cement plants, as well as monitoring, reporting and verification systems, and finance components," said Mark Houdashelt, of CCAP. Funding from the Dutch Ministry for Infrastructure and Environment is supporting the design of the financing plans for the alternative fuels NAMA.

Of the European contributions to Mexico's climate financing, Germany is worth notice. The German government-owned development bank, KfW, currently has three different climate financing programmes in renewable energy or energy efficiency in Mexico. One is a credit line to Bancomext of US$50 million for renewable energy development, mostly wind farms. Another is a US$50 million credit line to NAFIN, Mexico's state development bank, mostly for energy efficiency programmes that exchange old refrigerators and air conditioners. And the third is a US$80 million credit line to Mexico's low-income mortgage program, SHF, for energy efficiency in the building sector.

Modernising urban transport in Mexico

In 2008, Mexico announced it would reduce greenhouse gas emissions to 50 percent below 2002 levels by 2050. In 2009, it went further, and President Felipe Calderon announced a special climate change program for Mexico, identifying specific projects with their low-carbon benefits. One major project was in the transportation sector.

The Urban Transport Transformation Program will modernise the urban transport systems of Mexico's large cities, by putting in place efficient, low-carbon bus rapid transit systems and light rail. The plan is modeled after a bus rapid transit corridor recently installed in Mexico City that has proved efficient, cost-effective, and popular. Mexico received US$150 million in financing from the World Bank, in which Europe is a major funder.

When the UTTP is fully in place in 2017 the World Bank expects to reduce CO2 emissions by 1.96 million tonnes a year.

Why focus on transport? Transport contributes 18 percent of Mexico's total greenhouse gas emissions, second only to energy generation. About 75 percent of Mexicans live in urban areas. With the increasing trend of urbanisation underway in Mexico, ever more people are using urban private and public transportation. Between 1990 and 2005, transport emissions increased 27 percent in Mexico. Mexico contributes 2 percent to the global transport sector's GHG emissions, according to a 2007 World Bank Transport and Climate report.

At the root of the problem is Mexico's reliance on used, fuel inefficient American cars and a fleet of privately operated, very old buses, many of which do not conform to modern fuel standards. Mexico has more vehicles per person than anywhere else in Latin America, 107 per 1,000 people.

The Mexico City bus rapid transit system was put in place in 2005 along busy Insurgentes Avenue, a major transportation artery. The Insurgentes Metrobús system features a dedicated bus lane and 89 modern, articulated buses that travel unfettered by city traffic. Passengers pay prior to boarding the bus, making for less idling time. Recent emissions studies show that cars, trucks and buses in Mexico City account for 52 percent of nitrogen oxide, 40 percent of hydrocarbon and 36 percent of particulate matter emissions.

Under the transport plan, cities will tap the World Bank's Clean Technology Fund (CTF) for US$200 million in financing for transportation infrastructure construction and the purchase of fuel-efficient buses. The CTF will also buy old buses and set up a scrap-metal recycling process, as needed. The UTTP will also fund nonmotorised transport projects, such as commuter parking lots, bike lanes and sidewalks. Cities will apply for financing through the new National Infrastructure Fund, created within Mexico's development bank, BANOBRAS.

PROJECT: Urban Transport Transformation Programme
DONOR: Clean Technology Fund of the World Bank
HOST COUNTRY: Mexico
SECTOR: Transportation
CO2E REDUCTIONS: 1.96 million tonnes
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European Union donor countries contributed half of the total US$6.5 billion in pledges to the Clean Technology Fund in 2008.

A bright future for solar energy

Hot water heating program modeled after the German market incentives

One way to reduce greenhouse gas emissions is to use solar collectors for heating water, instead of gas or oil systems. Mexico is ideally situated for solar energy because of its sunny weather and high altitude. The 60,000 residents of the Heroes de Tecamac neighborhood in Mexico City wanted to make a difference for the environment.

Under a programme funded by 3.1 million Euros from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and administered by the German development agency, GIZ, Mexican families will be able to receive subsidies to install solar roofs to supply hot water. About 25,000 units will be installed during the life of the program, between 2009 and 2012. A goal is to build up a competitive solar installation business in Mexico City. Without the subsidies, the solar systems would be financially out of reach for families.

The programme is called Green Mortgage, and is being carried out by the National Workers Housing Fund Institute (INFONAVIT). In this case, it targets low-income families and is modeled after the German Market Incentive program.

It is estimated that starting in October 2012, about 160,000 tonnes of annual CO2e emissions will be avoided.

PROJECT: Solar water heaters
DONOR: Germany
HOST COUNTRY: Mexico
SECTOR: Solar
CONTRIBUTION: 3.1 million Euros, CO2e reductions: 160,000 tonnes
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A green light to wind

European investment serves as catalyst for evolution of renewables in Mexico

Today, Mexico has a thriving wind power generation programme as part of its overall renewable energy scheme. But it wasn't always this way. Wind generation in Mexico took off 10 years ago, when a push from interested government sectors and seed money from GEF began to make wind power generation in Mexico more attractive to investors.

In 2001, Mexico's Ministry of Energy (SENER) decided to promote renewable energy, particularly wind, which is plentiful in Mexico. It worked with the Energy Regulatory Commission (CRE). SENER was forced to act because Mexico's state-owned electric utility (CFE) had not promoted the development of Mexico's wind resources, since wind power is intermittent and could not be easily dispatched by Mexico's electric grid system. These agencies worked together over the next 10 years to tackle infrastructure constraints and financial and institutional barriers to wind generation.

They had their work cut out for them: Mexico had no large wind power plants. At the end of 2000, Mexico had 41,000 MW of installed power capacity, with 70 percent of this coming from fossil fuels, leading to significant emissions that contribute to both local and global environmental problems. About 11,000 MW came from hydroelectric power and other renewable energy, primarily privately owned old sugar cane mills. Installed capacity of wind energy was less than 3 MW.

It was important that Mexico see that wind generation could work, so CFE was mandated to build a large wind plant. In 2007, an 83.3 MW plant began operation, which was also supported by the World Bank. The World Bank agreed to purchase the associated emissions reductions through the Spanish Carbon Fund and the Bio-Carbon Fund.

One big barrier is that CFE is required by law to purchase the lowest-cost electricity available. Given the start-up costs of wind energy, it was not cheap enough for CFE to purchase. But changes in the tax code in 2004 – allowing companies to deduct 100 percent of their investment in equipment and machinery for renewable energy in a single year – and a US$70 million GEF grant issued to support wind powered independent power producers, were among the drivers that helped turn the tide for renewable investments (See "Making Progress in Mexico"). Additionally, it appears that the ability of industry to generate electricity through the self-supply route, coupled with the income from carbon credits generated under the CDM, also served as an incentive to the development of wind energy in Mexico.

Of the US$70 million seed grant funding, the first US$25 million created a fund that would pay out an extra 1.1 cent per kWh for energy produced by wind and other renewable energy sources, and for capacity. The goal was to install a 101 MW wind power project.

These efforts worked, and in 2011, the first wind generation plant developed by an independent power producer in Mexico started producing electricity. Its success was enough to convince CFE to build four of its own 100 MW wind plants, and they are projected to go online in late 2011. In addition, CFE intends to build four more plants, 300 MW each, to start up between 2013 and 2016.

The policy support and the original upfront financing Mexico received from GEF served as a catalyst to the development of renewable energy in Mexico. Today, CFE and Mexico's Energy Regulatory Commission (CRE) and Ministry of Energy (SENER) are pushing ahead on a number of wind generating projects. Mexico recently revised its energy goals and by 2025 wants to obtain 35 percent of its energy from clean sources, which include nuclear, large hydro, and renewable energy. Fast Start Finance offered for Nationally Appropriate Mitigation Actions (NAMAs) presents a new opportunity to promote wind and other renewable energy resources on a more comprehensive basis and with lower transaction costs.

Just over 520 MW from wind was in place by 2010, saving an equivalent of 587,621 tonnes in CO2e emissions per year. By 2016 this will grow by an additional 2,684.8 MW. Even with these projects, wind provided just 7 percent of Mexico's electricity output in 2011, despite great opportunity to capture wind in Mexico.

Electricity prices in Mexico are heavily subsidised for the residential and agriculture sectors, while industrial and commercial enterprises pay above-market prices.

The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.

European Union member states are major shareholders and partners in the work of the World Bank Group, accounting for nearly one-third of shares in the International Bank for Reconstruction and Development and half of contributions to the International Development Association.

Pumped up

Farmers avoid greenhouse gas emissions by using solar-powered irrigation pumps in Mexico

Five percent of Mexico's population does not have access to electricity. These families live mostly in rural areas, and include 600,000 livestock farmers. The Alianza programme provided farms with electricity and at the same time avoided greenhouse gas emissions.

In 1996, Mexico launched the Alianza para el Campo programme to provide matching grants to farmers to purchase equipment for irrigation and to power farm equipment. But by 1999, just 195 pumps had been installed and there were problems. The initial costs of the systems were too high for farmers, the equipment broke easily, and there was a lack of trained personnel to install it.

In 1999, the World Bank Climate Change Program got involved and provided an US$8.9 million grant from the GEF Trust Fund, to which the European Union provides over a third of all funding, to help farmers purchase and install solar-powered irrigation pumps. Without the GEF contribution the project would have relied on conventional energy sourced equipment, so this project has had a clear impact on avoiding greenhouse gas emissions.

Up to 2004, the final year of the program, 2,312 farmers were provided with electricity through the solar pumps. The installed solar pumps abated 36,292 tonnes of carbon per year, according to estimates of the Trust Fund for Shared Risk, of the Mexican Secretariat of Agriculture, Livestock, Rural Development, Fishing and Food.

PROJECT: Alianza
DONOR: World Bank / GEF
HOST COUNTRY: Mexico
SECTOR: Solar
CO2E REDUCTIONS: 300,000 tonnes
INVESTMENT: US$454.9 million
The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.

Lighting the way to the future

Norway, GEF finances compact fluorescent lamps in Mexico

Compact fluorescent lamps (CFLs) use 75 percent less energy than incandescent bulbs. Making the transition to CFLs automatically decreases overall energy consumption and lower the emissions of harmful byproducts, such as SO2 and NO2. "In terms of climate change, this is among the lowest of low-hanging fruit. Eight percent of global greenhouse gas emissions are linked with lighting," says UNEP Executive Director Achim Steiner.

Mexico had a very low usage rate of compact fluorescent lamps (CFLs). In the early 1990s the government began the ILUMEX program to promote them. In 1995, Mexico received a US$10 million grant from the GEF of the World Bank and US$3 million from Norway. The new funds boosted promotions of CFEs and provided subsidies for their purchase. In short, it allowed the program to get off the ground.

The World Bank and Norway funding finished in 1998. By that time, the project was well on the road to being successful. Between 1999 and 2004, sales of CFLs to households grew from 2.1 million units annually to 7.4 million and were expected to grow to 10 million by 2010. Part of this increase can be attributed to a growing awareness about the environmental importance of CFLs, but also during this time the cost of electricity rose and the price of CFLs decreased, as more CFLs were manufactured in Mexico. In 2010, the Clean Technology Fund provided US$50 million in financing for an efficient lighting programme and for a tax credit for the purchase of energy efficient appliances.

The World Bank estimates that GHG emissions were reduced between 430 to 715Kt in 2004, and GHG emissions were reduced to 2.0 to 3.2 Mt in the period 1995 to 2004.

PROJECT: Ilumex
HOST COUNTRY: Mexico
DONOR COUNTRY: Norway, GEF, World Bank (CTF)
SECTOR: Lighting
CO2E REDUCTIONS: 3.9 million tonnes
INVESTMENT: US$3 million (2.17 Euros); US $50 million by CTF.

The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.

European Union donor countries contributed half of the total US$6.5 billion in pledges to the Clean Technology Fund in 2008.

High potential

Renewables and energy efficiency make gains through incentives and policy

India's energy production will need to increase six-fold by 2030 to support its rapid economic growth and the shift of 100 million Indians to the middle class. Meanwhile, nearly 400 million Indians still lack electricity, and India remains the G20 country most vulnerable to the impacts of climate change.

But India has the potential to combat all these problems. With the ability for solar capacity to far exceed current annual energy consumption as well as abundant hydropower, wind and biomass, India's clean energy resources – combined with its skilled labor force and access to international markets – could make it a world leader in renewable energy generation. Additionally, India's vast energy efficiency potential can contribute to emissions reductions and meet the country's energy demands.

Over the past couple years the Indian government has increasingly realised that the time to take advantage of those opportunities is now. In June 2008, it released a National Action Plan on Climate Change outlining mitigation and adaptation polices and targets in eight areas, including renewable energy and energy efficiency.

As part of this plan, a National Solar Mission is promoting and expanding India's solar capacity with the ambitious target of reaching 20 GW solar and 74 GW total renewables by 2022. Installed renewable capacity has already reached 17 GW and analysts expect an additional 40 to 55 GW by the end of India's 13th Five-Year Plan in 2022.

"Though its pace has been a bit slower than was originally hoped, India has been progressing toward these goals," says Anmol Vanamali, a director at CCAP who works on their developing country programmes.

He points to a trading market in renewable energy certificates that began in April 2011. "The existence of a vibrant renewable energy certificate trading market only bodes well for all sorts of renewable energy technologies – not just solar but wind and biomass, too," says Vanamali.

EUROPEAN SUPPORT

European financial and technical expertise has played an important role in many of India's clean-energy efforts, including incentivising the shift to cleaner energy on a household level. For instance, a programme developed by UNEP, with funding from the Shell Foundation and U.N. Foundation, has enabled Indian banks to offer lower interest-rate loans for rural households interested in purchasing an energy- and cost-saving solar home system. And a project to help replace polluting and expensive kerosene lamps in rural households with solar-powered lamps likely would not have been possible without the work of EU-based firms and organisations to develop the project into a Clean Development Mechanism programme.

Still, analysts estimate that US$60 billion in investment will be needed over the next decade to meet India's renewables targets, so its success may ultimately hinge on the availability of adequate financing.

Europe has a clear role to play in generating and enabling that financing, but it has also been crucial in supporting the capacity building of Indian institutions as they develop and implement mitigation policies – as can be seen by the role it has played when it comes to India's energy efficiency policymaking.

According to the National Mission on Enhanced Energy EfficAccording to the National Mission on Enhanced Energy Efficiency (NMEEE) India should be able to save an estimated 183.5 billion kWh annually through a market for trading energy efficiency certificates that will likely begin in 2012, thus mitigating an estimated 98 million tonnes of CO2e emissions per year. Institutions such as the Bureau of Energy Efficiency (BEE) are being supported in their efforts by institutions such UK-FCO and GIZ. Such bilateral support has helped fund workshops for awareness creation and for technical experts who have been an integral part of the implementation process. Bilateral assistance for capacity building, within government institutions such as the BEE and amongst a wider range of stakeholders, is crucial for the long-term success for ambitious domestic policies.

Financing the high upfront costs of energy efficiency efforts remains a challenge, but with the help of international and EU funding the sector is making some headway. A project to replace outdated CFC-based chillers in Indian buildings is benefitting from GEF funding to reduce upfront costs of the replacements, for instance.

Within a few short years, then, India has both developed a new approach to dealing with climate change and dramatically enhanced the policies and institutional capacity it has available for tackling the problem. As these examples demonstrate, European cooperation has been key in supporting programs which have been developed under the new climate plan.

PHOTO CREDIT: myclimate

India's sugar-cane powered future

A Swiss social enterprise boosts power, reduces emissions in India

After the sugar cane and coconut crops are harvested in the little-developed Karnataka region of southern India, local workers gather the agricultural waste products from fields and bring them to the Malavalli Power Plant, where they are used as fuel for energy production. Prior to this project, farmers burned the agricultural waste in the fields, and the smoke emitted heat-trapping gases that polluted the atmosphere. Now, 18,000 tonnes of CO2e emissions are reduced each year through harvesting the biomass.

The Swiss social enterprise myclimate financed the project through the Clean Development Mechanism and sells the CERs generated by the plant. This was the first CDM project worldwide to produce CERs accredited by the Gold Standard.

Not only does the local Karnataka community benefit from additional jobs and development, as the project employs 450 people in the region and contributes US$1 million to the local economy, farmers are paid for their waste. In addition, farmers receive back ash residue that's been turned into organic fertilizer and apply it to their fields.

The power generated by the Malavalli Power Plant is sold back to the national grid and benefits locals. One resident has said that access to reliable power and more of it has directly benefitted his rice producing business. Villagers used to have power outages frequently, and only had six hours of electricity per day on average. Many used diesel generators as backup, but those are twice as expensive as electricity.

Because India produces about 250,000 million tonnes of sugar cane each year, and leaves about 30 million tonnes of waste to burn in the fields, experts say the potential to generate electricity with biomass is high. So far, the biomass waste used for Malavalli has been in plentiful supply. While many biomass plants use coal as a back up fuel, Malavalli has never fired any fossil fuel, according to Gold Standard documentation. Malavalli plant provides 4.5 MW of energy, and is privately owned.

PROJECT: Malavalli Power Plant
DONOR: myclimate (Switzerland)
HOST COUNTRY: India
SECTOR: Energy
CO2E REDUCTIONS: 18,000 annually
PRESS CONTACT: Kathrin Dellantonio, myclimate
E-MAIL: info@myclimate.org
PHOTO CREDIT: myclimate

Letting a little light shine

EU financial and technical support prompts off-grid solar lighting for households, replacing kerosene

Over 60 percent of Indian households do not have electricity. Instead, they rely largely on kerosene for their lighting, which leads to indoor air pollution, GHG emissions and high fuel costs. To help address these problems, the social enterprise D.Light produced a solar-powered light-emitting diode (LED) lamp which could be distributed to the poorest households in countries like India.

Private investors expressed some interest in supporting the project but doubted whether it would be economically viable without additional funds from the potential carbon offsets the program would create. In order to secure that carbon finance, the project was developed into a CDM project by the Dutch firm OneCarbon and was certified as a premium offset by the Gold Standard Foundation, whose major donors include Germany and other EU countries. Due to the necessity of carbon credits in getting the project off the ground, then, EU financial and technical support has proven central to the project's success.

The project, which will last from 2009 through 2014, will save 30,052 to 53,123 tonnes of CO2e per year, equal to at least 1.9 million Euros over the six-year lifespan of the project assuming a price of 11 Euros per tonne. The project has since been expanded to Tanzania

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PHOTO CREDIT: d.light design

Keeping cool, saving energy

GEF project to replace one-third of outdated building chillers, improves energy efficiency by 40 percent

Though it could save up to 40 percent in energy costs, most building owners in India have been reluctant to replace outdated, CFC-based chillers, in large part due to high upfront costs. In order to incentivise action, and the phaseout of consumption of ozone-depleting substances required under the Montreal Protocol, the India Chiller Energy Efficiency Project (CEEP) is replacing 370 of India's estimated 1,200 chillers between 2011 and 2014.

To accomplish this, US$6.3 million from the GEF and US$1 million of the Multilateral Fund of the Montreal Protocol are used to fund subsidies to lower the upfront replacement costs. Over a third of GEF funding comes from the EU. In addition, payments from the EU for the carbon credits generated by these replacements will help transform additional units. The project will reduce GHG emissions by an estimated 13 million tonnes of CO2e over the next 20 years.

The success of CEEP has prompted expansion to inefficient non-CFC chillers and has moved beyond India's borders. Similar projects are now being prepared in the Philippines and Indonesia.

PROJECT: Chiller Energy Efficiency Project
DONORS: GEF, Multilateral Fund
HOST COUNTRY: India
SECTOR: Energy efficiency
INVESTMENT: US$7.3 million
CO2E REDUCTIONS: 13 million tonnes
The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.

Buying power

EU financial support builds solar market in India

Solar home systems have become an increasingly viable option for rural households in India over the past two decades, but the high initial costs of such a system remain a major obstacle to those wanting to switch from expensive, polluting energy sources such as kerosene. The vast majority of rural households do not have the cash to spend on such a solar home system (SHS) – no matter what savings it would bring over the next years. These households need access to credit that will allow them to purchase and start using a system right away, while paying for the system over regular intervals with the money they would have spent on kerosene.

A four-year, US$7.6 million Indian Solar Loan Programme was launched in 2003 to help jump-start this market for SHS loans. Support from UNEP and the UNEP Risoe Centre helped Canara and Syndicate Banks and their affiliated Grameen banks overcome their initial lack of confidence in SHS technology and include it in their lending portfolio. Interest rate buydowns, supported by US$1.5 million from the UN Foundation and the UK-based Shell Foundation, allowed the Indian banks to offer subsidised interest rates, as well as longer payback periods and smaller deposit requirements. With UNEP's help they developed loan products and the interest subsidy, in order to build the loan market without distorting credit risks or the existing SHS cash market.

By 2007, the banks had financed 19,533 solar home systems and the subsidy had been fully phased out, thus helping some of the approximately seven in 10 rural Indian households without electricity to overcome the high initial costs of the technology and reap the savings and health benefits.

Estimates of the amount of GHG emissions mitigated by the program were not available but its success has given rise to similar programs in China, Indonesia, Morocco, and Tunisia.

PROJECT: Indian Solar Loan Programme
DONOR: UNEP, UNEP Risoe Centre (Denmark), UN Foundation, UK
HOST COUNTRY: India
INVESTMENT: US$7.6 million, US$1.5 million
SECTOR: Renewable energy
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Influencing the commute

GEF financing helps Indonesia move into the fast lane of transportation emission reductions

Though the first bus rapid transit (BRT) system was built in Curitiba, Brazil, in 1974, it was not until the success of Bogota's TransMilenio system, which opened in 2000, that such systems began to really catch on elsewhere. The first Asia BRT system opened in Jakarta in 2005, with hopes of reducing the city's problems with traffic congestion and air pollution – but also with the aim of addressing the country's growing greenhouse gas emissions.

BRT systems provide more efficient service than a regular bus line, usually through dedicated bus lanes and prepaid ticketing, but are cheaper and more flexible than rail systems. The TransJakarta system was intended to provide comfortable, faster ways around traffic congestion, and thus coax those who would normally ride in a private car to switch to mass public transit. The new buses run on compressed natural gas and have lower emissions than conventional buses, which run on diesel and gas.

Indonesia is among the top 25 largest emitters of greenhouse gases in the world, and though that ranking is mainly due to deforestation and other land-use changes, transportation is a major contributor to those emissions both nationally and globally. An efficient and well-patronized BRT system in Southeast Asia's largest city could go a long way toward both reducing Indonesia's own emissions and setting a model for other Asian cities to follow.

In 2006, the Global Environment Facility (GEF) through United Nations Environment Program (UNEP) , funded the work of the Institute for Transportation and Development Policy (ITDP), the Jakarta government and their partners to continue providing technical support and further improvements to the TransJakarta system through a project called Bus Rapid Transit and Pedestrian Improvements in Jakarta. Running between 2006 and 2011, the main objectives were to help the nascent BRT system reach its full potential both in terms of transport and environmental benefits. GEF provided US$5.8 million towards this work.

Though ridership still lagged behind that of other BRT systems a few years ago, as of June 2011, the TransJakarta system was estimated to be carrying up to 380,000 passengers per day, a 52 percent increase from the 2009 estimates, making it one of the largest BRT systems in the world. Of those passengers, 34 percent said they would be using private vehicles if the BRT system were not available.

Its impacts go beyond Jakarta, though. "The system has managed to influence the national government to replicate a similar concept in at least 10 other cities in Indonesia, and, to date, most of them are already in operation," said Yoga Adiwinarto, a transportation specialist with ITDP's Indonesia office.

And BRT systems in other Asian cities are also learning from TransJakarta's successes and challenges. "TransJakarta is not only a good example for other cities here in Indonesia but also for other cities in the region. Think about the Philippines or Malaysia, which aim to have similar systems up soon. We will surely think about the experiences of Jakarta when we start to implement such projects there," said UNEP's Peerke de Bakker, who has worked on the BRT project in Indonesia and other mitigation efforts.

The GEF-funded expansion project has been estimated to have reduced GHG emissions by another 39,729 tonnes since it began in 2006, bringing TransJakarta's total annual emissions reductions to an estimated 196,034 tonnes.

PROJECT: TransJakarta BRT
DONOR: GEF
HOST COUNTRY: Indonesia
SECTOR: Transportation
INVESTMENT: US$5.8 million
CO2E REDUCTIONS: 200,000 tonnes
PHOTO CREDIT: ITDP
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PHOTO CREDIT: Gunkarta Gunawan Kartapranata

The European Union contributes approximately 33 percent to 40 percent of overall funding to the GEF in each replenishment period.

The European Union contributes 80 percent of funding to UNEP.

Three-wheeled reform

Investment from EU drives local policy change in Sri Lanka, attracts domestic private finance for electric vehicles

Over half of Sri Lanka's motor vehicles – and a quarter of its population – are in the capital of Colombo, leading to air pollution problems and a high concentration of greenhouse gas emissions. But this concentration also presents an opportunity, as the city's compact boundaries and population density– along with relatively inexpensive electricity, a significant proportion of which is from non-emitting hydropower– make it an ideal place for zero-emission electric vehicles to flourish.

Recognising this opportunity, the Global Environment Facility's Small Grants Programme (SGP), to which the EU contributes 33 percent of overall funding, granted US$28,946 to the local non-profit Lanka Electric Vehicle Association (LEVA) for 2003 through 2005. This project had a simple goal: to demonstrate that electric three-wheel rickshaws were a viable alternative for public-transport taxis in Colombo and to build local capacity for the vehicles' assembly and maintenance. The main impacts would be reduced GHG emissions and improved air quality.

But this simple plan was derailed almost immediately. No customs code allowed the prototype vehicle parts into the country. No provision in the traffic laws allowed electric vehicles to be registered to be driven in Colombo. At both roadblocks, LEVA switched its focus from demos and capacity-building to becoming a catalyst for policy change within the country. In both instances, their lobbying resulted in policy changes that have made it much easier for future electric vehicles to be constructed and driven in Sri Lanka. Eventually, LEVA was able to return to the original focus, and began training unemployed youth to maintain the demonstration vehicle as well as to build parts so that the vehicles could be assembled locally.

Electric vehicles are especially appropriate for urban centers, and Colombo is no exception since its density eliminates the need to travel long distances and it has plentiful electricity.

Three Sri Lankan companies are now importing and assembling electric motorcycles, small cars, and rickshaws. Hotels and resorts are increasingly using electric golf carts and three-wheelers on their grounds. The grant provided a catalyst for investors, who have spotted a business opportunity and are now funding various schemes.

"The companies are investing as the policy environment surrounding electric vehicles continues to improve and business is promising," said Shireen Samarasuriya, SGP's national coordinator for Sri Lanka.

"The project took the initial risk to demonstrate a prototype and pave the way for EV implementation in the country," said Samarasuriya. "The private sector is therefore investing in EV technology across the island. Upscaling is happening organically by the private sector, supported by the state." She says that there has been a proliferation of electric cars since 2009 and that there are currently approximately 15,000 electric motorcycles in the country.

In less than a decade, a small pilot project introduced a previously little-known technology to a country, changed the policy landscape, laid the groundwork for a new industry, reduced fuel emissions, improved local air quality, and contributed to global climate change mitigation.

PROJECT: Electric Vehicles
DONOR: GEF (33-40 percent EU funding)
HOST COUNTRY: Sri Lanka
SECTOR: Transportation
CONTRIBUTION: US $28,946
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Full steam ahead

European financial institutions help ensure a quarter of Kenya's energy will come from geothermal sources by 2015

Northwest of Nairobi, Kenya, on the edge of Hell's Gate National Park, sits a geological phenomenon along the East Africa Rift. Dormant volcanoes have created a vast geothermal field that is now a source of renewable energy for many Kenyans. The Olkaria III expansion is the latest in the development of this geothermal power resource; its capacity increased from 13 to 48 megawatts (MW) through the influx of European loans. Olkaria III is the third geothermal power station in that region and the first one in Africa that was entirely privately funded and developed. (Olkaria I and Olkaria II are owned by KenGen, a state-owned electricity company.)

Making electricity from geothermal energy decreases the need for fossil fuels. The Kenyan government estimates that the potential of geothermal power in the country is about 7,000 MW. Although the capacity in Kenya to develop geothermal energy as a power source is high, geothermal energy is not widely used. Instead, 60 percent of the electricity in Kenya is produced by hydropower plants, which become problematic in a country that experiences frequent drought. Geothermal power is more reliable because it can always produce energy, independent of the weather.

The costs to access and develop the vast geothermal reserves were immense barriers to development of Olkaria III. Long-term loans in Kenya have been difficult to secure due to political instability. When Deutsche Investitions- und Entwicklungsgesellschaft (DEG) and the KfW Development Bank provided long-term loans of US$40 million to Orpower 4, Inc., the owner of the power plant, it was a significant commitment. The German investment bank DEG also arranged further loans to meet the project's total need of US$105 million (76.5 million Euros); the other lenders are from European Finance Partners, a financing vehicle of the 13 European Development Finance Institutions and the European Investment Bank, the Emerging Africa Infrastructure Fund (EAIF), and the European development finance institution Proparco, of France, and FMO, of The Netherlands.

Carbon financing was an important factor in the planning and development of Olkaria III. Over its seven-year emissions crediting period, from 2009 to 2015, the Olkaria III will achieve emissions reductions of 1.2 million tonnes of CO_2e. Annually, it will average 177,600 tonnes of CO_2e emissions reductions.

"This initiative means that the cost of power to the end user will be less than that generated from fuel oil or other alternative energy sources. This in effect will assist in holding down the cost of electricity to consumers as well as for the industry," Tony Lea, Chairman of the EAIF, commented.

Policy barriers initially created difficulties in the development of Olkaria III. The Kenyan government in 2008 adopted a renewable energy Feed-in Tariff (FIT) for solar, wind, small hydro, and municipal waste energy – but it omitted geothermal. In 2010, the government revised its policy to include geothermal, biogas, and solar generated electricity and made a long-term commitment to the development of renewable sources of energy. In addition to policy changes, since 2009 Kenya has made several institutional changes, including the establishment of a climate change coordination unit in the Office of the Prime Minister and a climate change desk at the Ministry of Environment and Mineral Resources. The government also established a Green Energy Task Force to ensure the expansion and generation of green energy to meet Kenya's future electricity requirements.

The expansion of Olkaria III has been so successful that other geothermal projects are now planned. The European Investment Bank and the French development agency Agence Française de Développement (AFD) are providing loans of 269 million Euros, and an additional 63 million Euros in interest rate subsidy, that will finance expansion of Olkaria I and IV for an additional 280 MW of electricity by 2013. The government of Kenya is now leading further development of geothermal energy and has incorporated the Geothermal Development Company to explore resources and drill exploratory wells. And, Olkaria III is now planning to double its power output, expanding to 100 MW, through financing from the Overseas Private Investment Corporation. By 2015, 25 percent of Kenya's electricity will be provided from geothermal energy.

PROJECT: Olkaria III
DONOR: Germany, France, The Netherlands, UK, and EU
HOST COUNTRY: Kenya
SECTOR: Energy
CO2E REDUCTIONS: 1.2M tonnes
INVESTMENT BY EU: 76.5 million Euros
PHOTO CREDIT: DEG
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Uganda

Geothermal energy helps meet increased demand

German investment in geothermal development will help Ugandans have a reliable power supply

Uganda has plans to harness the geothermal potential to generate 100MW of electricity between 2011 and 2015. The government developed the Renewable Energy Policy of 2007, which provided a framework to increase the contribution of renewable energy in the energy mix up to 61 percent by 2025.

Geothermal energy development in Uganda has benefitted from German state-of-the-art technology and funding from Germany's GIZ for funding of renewable energy development. In 2012, the German development bank KfW will provide between 20 million Euros and 50 million Euros to the Geothermal Risk Mitigation Facility for surface studies and exploration drilling of geothermal prospects in Uganda, Kenya Tanzania, Rwanda and Ethiopia.

"Geothermal is one of the renewable energy sources being promoted in line with that policy," Peter Lokeris, Uganda's minerals minister, has said. "Arising from the Renewable Energy Policy, feed-in tariffs for renewable energy projects have also been established to create a predictable business environment." The Ugandan government recently revised the country's feed-in-tariffs to help develop consistent pricing in the sector.

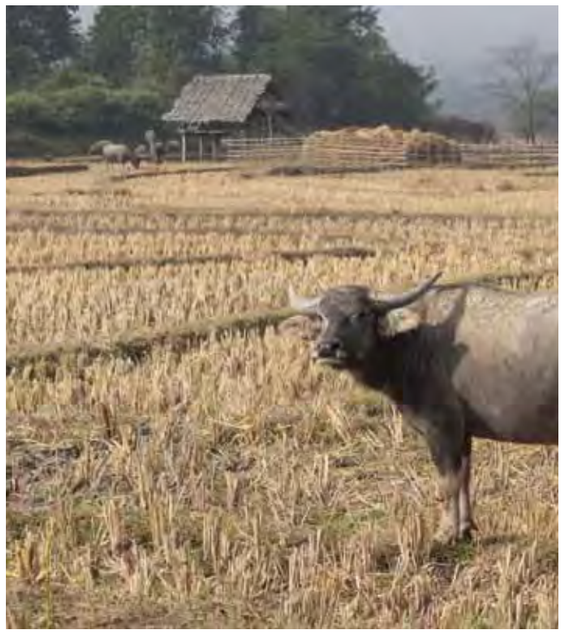
PROJECT: Geothermal Risk Mitigation Strategy
DONOR: Germany
HOST COUNTRY: Uganda, Kenya, Tanzania, Rwanda, Ethiopia
SECTOR: Renewable Energy
INVESTMENT BY EU: 20-50 million Euros

Mongolia

Building with straw

Energy-efficient buildings reduce heating costs by up to 70 percent

Often called nature's insulation, straw-bale building materials have been proven to increase energy efficiency. This super-insulation both reduces heating costs significantly – by up to 70 percent – and cuts greenhouse gas emissions. Given the brutally cold winters, lack of wood products in many parts of Mongolia, and the abundance of locally available straw that is seen as a waste product, straw as a building material seems ideally suited for Mongolia. And, considering that the country's capital, Ulanbaatar, the world's coldest city (annual average temperature is -2°C), has a rapidly growing population, straw bale housing presents a number of other advantages, like improved living conditions and cleaner air quality.



Over the past 13 years, development of the straw bale building industry in Mongolia has been supported by US$7.39 million, though financing by the GEF and co-financing by partners including the Government of Norway, GTZ, and others. The first phase of the project began in 1997 with the introduction of modern, energy-efficient straw-bale building materials and technologies into the public and private sectors. Now in it's fourth phase, the "Energy Efficiency in New Construction in the Formal Buildings Sector in Mongolia," or project BEEP, will apply new efforts to expand the already growing straw bale building sector and identify the building code barriers, improve training programs, and facilitate access to energy efficiency financing to allow a full-scale transformation and commercialisation of straw bale building technologies.

Conditions now exist for sustainable market development, and the goal is to retro-fit or build 1200 gers (yurts) annually. Currently 440 gers are built per year, which ranks Mongolia as the leader in the number of straw bale buildings in the world.

PROJECT: Energy-efficient straw-bale housing
DONORS: GEF, Norway, Germany, EU
HOST: Mongolia
SECTOR: Building, energy efficiency
INVESTMENT: US$7.39 million
CO2E REDUCTIONS: n/a

Tunisia

Solar success

Financing from Italy removes barriers for Tunisians to purchase solar water heaters

Roughly 7,400 households in Tunisia used solar water heaters in 2005. By 2011, 133,340 households did – a market transformation that might have seemed impossible before a financing mechanism helped accelerate the development of a robust solar water heating market. Understanding this shift has proven useful for other solar energy financing programs in developing countries.

Sunshine is an abundant resource in Tunisia. Despite the obvious benefits of solar water heaters for households, the cost of purchasing a solar heater is too high for many people. So in 2005 Programme Solaire (PROSOL) developed an innovative financial support mechanism to increase solar energy capacity. Starting with 1.7 million Euros in initial funding from the Italian Ministry for Environment, Land and Sea through the United Nations Environment Program (UNEP), PROSOL helped the Tunisian government provide low interest loans and credits so families could overcome capital investment barriers. The solar water heater market showed a dramatic increase when loans became available. By 2010, PROSOL built a solar water-heater market worth US$66 million (48.1 million Euros).

To make it easier for Tunisians, several financing measures have been adopted. First, a subsidy covering the initial capital cost removes the purchasing barriers. Loan payments for the solar water heaters are paid back in a five-year term through the electricity bill. Local banks have enhanced security for their loans through contracts with electricity utility Société Tunisienne d'Electricité et du Gaz (STEG) because there is no risk of nonpayment. Therefore banks were able to lower the interest rate from 14 percent to 7 percent; and during the first two years of PROSOL, UNEP provided an interest rate subsidy to make the loan interest-free. Because energy savings directly benefit the end user, the water heater can pay for itself in four years.

PROSOL has helped form policy changes that support a long-term, sustainable solar water-heater market. The Tunisian government now encourages solar energy by allowing a subsidy that was previously provided only to LPG. PROSOL has been so successful that after the first two years, the Tunisian Government decided to continue the project even if the funds from the Italian Ministry and UNEP phased out. The success of PROSOL has incentivised private finance in Tunisia to flow.

By the end of 2008, the PROSOL program reduced carbon emissions by 214,000 tonnes.

Under a slightly modified PROSOL Residential programme, the Tunisian Government has now set a target of 750,000 m2 of solar panel surface to be installed before 2014 and plans to reach this ambitious goal without any additional international finance. If this is accomplished, Tunisia will have the same amount of installed solar water heating capacity as Spain or Italy, countries with populations four and six times higher, respectively.

"PROSOL aims to replace conventional energy – LPG, electricity, natural gas – by solar energy to get hot water. It thus provides a solution for reducing greenhouse gas emissions and climate change mitigation," said Noura Ben Laroussi Lazreg, General Manager, ANME, which is the Tunisian National Agency of Energy Conservation. "The success of this programme is based on a public-private partnership and a significant change in the pace of achievements. In addition to creating a network of industrial and installation companies that employ about 6,000 people, this success has also contributed to the decrease in state subsidies allocated to conventional energy."

PROSOL has also developed similar financial mechanisms and policies that extend to the tertiary market, which includes hotels and other service industries; and for photovoltaic technology and industrial markets.

PROSOL'S SUCCESS HAS NOW MOVED BEYOND TUNISIA'S BORDERS

Montenegro
In Montenegro, which has the highest level of sunlight in Europe, UNEP is creating a similar financing scheme by developing a joint programme with the government to build a sustainable, long-term residential solar water-heater market through financing low-interest loans and subsidising capital costs.

Egypt
Solar power was first adopted in Egypt in the 1970s. Now a public-private partnership has emerged called EGYSOL, which provides the service and tourism sectors solar water-heating systems for Red Sea and South Sinai hotels.

Macedonia
Macedonia is currently building on the successes in Tunisia with MACESOL, which seeks to build a sustainble solar water-heater market by meeting the specific financing needs of the Macedonian population.

PROJECT: PROSOL Solar Water Heater
HOST COUNTRY: Tunisia
DONOR COUNTRY: Italy
SECTOR: Renewable Energy
INVESTMENT: 1.7 million Euros
CO2E REDUCTIONS: 214,000 tonnes
PHOTO CREDIT: PROSOL
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The European Union contributes 80 percent of funding to UNEP.

Seeing the light

Electricity initiative allows 1 million households in remote areas to switch from kerosene lanterns to compact fluorescents

Bangladesh aspires to deliver electricity to all of its citizens by 2020. This goal will be impossible to meet with traditional power generation because most people live out of reach of power lines. Even within the grid, the system suffers. Power plants now operating produce only about 4,700 megawatts of power to meet the country's current demand of about 6,000 megawatts, and frequent power outages interrupt industries. The struggle to meet demand on the current electrical grid means that about 60 percent of the country's 150 million people do not have access to electricity.

Electric wires will not reach these rural areas anytime soon. But because of an initiative to install solar photovoltaic systems, the way of life of rural Bangladesh is evolving quickly. Nine years ago, only 7,000 solar systems made electricity in Bangladesh. By June 2011, 1 million systems were running. Where kerosene lanterns illuminated the nights, now compact fluorescent lights do the job. Mussarat Farida Begum makes tea and serves local snacks to her patrons at the tea-cum-small restaurant she runs with her husband. With electricity generated by the solar panels, she can keep her small restaurant open even during the evenings and till late at night. Her business is booming, and her family lives much more comfortably with their increased income, she said. Begum also has electricity, generated by solar panels, at her home. Her children can now study at night and are doing much better at school.

The World Bank (Europe is a major funder) invested US$136 million (96 million Euros) over a six-year period in these off-grid solar systems, through the country's Rural Electrification and Renewable Energy Development Credit (RERED). In October 2011 the World Bank provided another US$172 million (121 million Euros), bringing the total the bank funded to US$308 million (217 million Euros).

Since 2003, the RERED has done much to advance electricity in Bangladesh: it has established grid connections and built new electric lines, but the most transforming of its efforts is the installation of small rooftop solar photovoltaic systems in areas where no electricity has ever been produced. The solar systems are small; in addition to running lights, they operate water pumps and power minimal refrigeration for medicine. The World Bank's loan funded about 300,000 of the solar systems, and homeowners pay the loans back to partner organisation intermediaries through installments.

The solar project is expected to displace 260,000 tonnes of CO2 emissions over the next 15 years based on reduced kerosene use.

PROJECT: Rooftop solar photovoltaic systems
DONOR: The World Bank
HOST COUNTRY: Bangladesh
SECTOR: Solar lighting
INVESTMENT: US$308 million
CO2 REDUCTIONS: 260,000 tonnes
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PHOTO CREDITS: World Bank, Arne Hückelheim

European Union member states are major shareholders and partners in the work of the World Bank Group, accounting for nearly one-third of shares in the International Bank for Reconstruction and Development and half of contributions to the International Development Association.

Firing up change

Low-carbon turbo-cookers scale-up sustainable change in El Salvador

El Salvador is the second most deforested country in Latin America, after Haiti, and has lost 85 percent of its forest cover in the last 50 years. Because 60 percent of urban households and 85 percent of rural households cook with firewood, the way people use the wood for cooking plays a major role in deforestation. A new stove, called the turbococina, hopes to change that. The stove offers a new cooking method that eliminates nearly all smoke and consumes approximately 90 percent less wood than a traditional cook stove. Because it is fueled with small pieces of wood, households can trim wood from branches rather than cut down whole trees.

"The advantage of this stove is that it doesn't smoke, and it saves on firewood," says Maria Gloria Orellana, who lives in the canton of Despensa, in the Colonia Elionor. "Compared to what I used to use when I cook, I am economizing a lot on firewood."

In the first phase of the project, 3,500 stoves will be distributed to schools and 5,000 to homes. In 2012, 30,000 will be distributed to households, and by 2014, 120,000 turbococinas will be distributed. Annually, the turbococina project is expected to achieve 500,000 tonnes of CO2e in emission reductions.

Soter AG, a Swiss-based organization, is responsible for financing the project. Soter AG produces the stove in Spain and transports it to El Salvador. Tecnologías Ecológicas Centroamericanas S.A. de C.V. (TECSA), the first CDM registered as a Programme of Activity in El Salvador, has implemented the turbococina project on-site and has partnered with the Social Investment for Local Development Fund and the Salvador Ministry of Education for distribution to schools. TECSA utilizes an existing Salvadoran program for economic and social development to supply turbococinas to the households. Private and public carbon funds, including the German development bank KfW, have confirmed their interest in purchasing CERs from the project. Because TECSA and Soter AG provide turbococinas free of charge, they will recover their investment through the sale of emissions reductions in the EU carbon markets.

PROJECT: Turbococina cook stoves
DONOR: Switzerland
HOST COUNTRY: El Salvador
SECTOR: Cookstoves, forestry
CO2E REDUCTIONS: 500,000 tonnes
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Constructing change

Swiss financing supports a French social enterprise to build improved stoves that reduce greenhouse gas emissions and use less firewood.

In the Peruvian Andes, open fireplaces used for cooking and heating are being replaced with efficient cook stoves through the Qori Q'oncha Program. Not only does this have a positive effect on forests, which face deforestation and desertification, the new stoves improve health by improving air quality in kitchens.

"There was a huge need in improved kitchens in Peru and therefore [the new stoves have] strong social benefits mainly through clean indoor air," said Martin Jenk, of myclimate, a Swiss-based organization that provides funding for the stoves. "The project is on a household level and addresses the most underprivileged population in very remote areas."

Open fireplaces cannot store heat and require large amounts of firewood. New ovens designed with local adobe bricks improve heat storage. Broken pieces of glass reflect the heat inside the oven, improving heating efficiency and reducing the quantity of firewood needed for cooking. By using local materials, Peruvians construct ovens themselves.

Microsol, a French social enterprise with operations in Peru, is the owner and manager of the Qori Q'oncha Programme. "Improved cook stoves projects are not only especially needed in Peru, but in every region or country in the developing world," said Arthur Laurent, carbon programmes manager at Microsol. "Besides the health improvement, it is important to mention that in Peru there are approximately 2 million people that still use traditional cook stoves." Myclimate offers voluntary carbon offsetting measures, buys the emission reduction credits from Microsol and sells them again. Microsol's Qori Q'oncha is registered as a Programme of Activity and gathers together many projects to improve cook stoves. Qori Q'oncha's three local partners –Sembrando, ADRA Perú and ProPerú – implement the program and teach Peruvians how to construct the ovens.

The project began in September 2008 and has been evaluated for the phase of 2008 to 2011. During this time 57,818 tonnes of carbon dioxide emissions have been avoided. So far, 209,000 efficient ovens have been built. To reach the goal of reducing 175,000 tonnes of CO2e within seven years, a further 227,000 ovens are planned to be built.

PROJECT: Qori Q'oncha
DONOR: Switzerland, France
HOST COUNTRY: El Salvador
SECTOR: Forestry
CO2E REDUCTIONS: 175,000 tonnes
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Conserving with cookstoves

German investment leads to efficient wood stoves that ease fuel demand in Nigeria

In Nigeria, wood is an important resource as most people use wood for cooking on traditional fireplaces. Over the last several years wood has become exceptionally expensive. Due to a high level of deforestation in the north, wood expenditures per meal are 10 times the costs of food a family purchases. While United Nations activities are attempting to reforest northern Nigeria, SAVE80's specially designed, stainless steel stoves and heat retaining boxes reduced the demand for wood in the Guinea Savannah zone. The efficient stoves use up to 80 percent less fuel wood than traditional cook stoves, reducing greenhouse gas emissions and saving fuel costs. "This is a wonderful stove," says Baraka Abdullahi, a SAVE80 user in Makarfi, Nigeria. "It cooks better, faster and cheaper."

A German company, atmosfair, has invested 800,000 Euros into the project. SAVE80 produces credits under the Clean Development Mechanism (CDM) called Certified Emission Reductions (CER). The Nigerian Developmental Association for Renewable Energies (DARE), a non-profit entity, is the owner of the CERs, labeled under the Gold Standard, and atmosfair is using the credits only for voluntary offsets.

Funding by atmosfair has resulted in reduced prices to SAVE80 end-users. Leben-Helfen-Lernen e.V., a German non-governmental organisation, oversees the procurement and shipping of pre-fabricated materials to make the stoves. DARE assembles and sells the stoves in Nigeria. So far, 5,632 SAVE80 stoves have been distributed. Atmosfair is also working on upgrading SAVE80 to a CDM Programme of Activity (PoA) designation for the whole of Nigeria, with several hundred thousand stoves planned for dissemination.

One SAVE 80 cook stove will reduce 2.72 tonnes of CO2e per year. It is expected that until 2019, 300,000 tonnes of CO2e will be reduced.

SAVE 80 stoves can be fitted with heat-retaining polypropylene boxes called Wonderboxes, which can be used for food that has already reached the boiling point and needs to simmer. The reduction of CO2e by the use of the Wonderboxes is not considered, but additional savings in fuel wood emissions are likely.

PROJECT: SAVE80
DONOR: Germany
HOST COUNTRY: Nigeria
SECTOR: Cookstoves, forestry
INVESTMENT: 800,000 Euros
CO2E REDUCTIONS: 300,000 tonnes
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PHOTO CREDIT: atmosfair

Light it up, grandmother

European financing helps spread the word about a new method of lighting cleaner fires

Air pollution from cook stove smoke in densely populated areas of South Africa pose serious air quality and health problems to residents. The Basa Magogo Project has been a cost-effective way to reduce air pollution on a wide scale, while also reducing 40,000 tonnes of greenhouse gases through more efficient cooking methods. In contrast with the other projects presented here, the Basa Magogo Project does not require any change in equipment; rather, the project spreads knowledge about a more efficient, less smoke intensive technique for lighting a fire. A side benefit is less indoor air pollution, resulting in fewer doctor bills for respiratory ailments.

Basa magogo, in Zulu, means "Light it up, grandmother!" The project aims to change the behavior of households by demonstrating a simple improved top-down ignition method for stoves used in cooking, heating, making hot water, and ironing. Instead of starting a small fire with paper and wood, adding coal on top of wood, and waiting up to an hour for the coal to glow; one puts the coal at the bottom and the wood on top, and then adds a small handful of coal to the wood. Coals begin to glow in 10 minutes and the fire emits less smoke than the conventional method.

Santo Sophie Vasamuzi, of KwaZomokuhle, South Africa, now cooks for her family using the Basa Magogo method of building a fire. "With this method much less coal is used and the fire goes more easily and faster," she said. "My family now uses only two bags of coal a month." Vasamuzi now spends the equivalent of 7.50 Euros less on fuel per month.

Local individuals are hired to demonstrate the new technique in public places as well as in private households in poor townships. Since 2009, 36,000 tonnes of CO2e have been reduced by implementing this new, efficient way to light the stoves. By the end of the project in 2018, an estimated 400,000 tonnes of CO2e will be reduced.

The project was initially sponsored with 2 million DKK by the Royal Danish Embassy and implemented by the NOVA Institute in South Africa. Additional funding was prefinanced by The FairClimateFund of The Netherlands. The FairClimateFund earns its investment back by selling the Gold Standard Verified Emission Reductions to organizations such as Klima Kollekte in Germany. This is a win-win situation: poor households reducing costs spent on fuel and positive health impacts through training of NOVA, supported by the sales of carbon credits by FairClimateFund.

PROJECT: Basa Magogo
DONOR: Denmark, Germany,The Netherlands
HOST COUNTRY: South Africa
SECTOR: Improved Cook Stove
CONTRIBUTION: 2 million DKK (269,000 Euros)
CO2E REDUCTION: 400,000 tonnes
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Conservation farming takes root

Norway's support of sustainable farming methods achieves land-use gains for Zambia

About 22 percent of Zambians make their living as farmers who till plots of 5 hectares or less, for family food, cotton, and maize. The traditional farming practices used by many of these small farmers are ultimately harmful to the soil fertility and structure. Greenhouse gas emissions associated with the agricultural sector are carbon dioxide, methane and nitrous oxide, which are produced from burning of savannas and field burning of agricultural residues. In addition to developing farming methods that reduce emissions, the Food and Agriculture Organization (FAO) of the United Nations and other organizations have sounded a warning that farmers in Africa must switch to environmentally conscious farming methods to counteract lower yields that are expected in the future, when changes related to climate change, including drought and infrequent, torrential rains, will make farming in Zambia even more challenging.

Since 1996, Norway's NORAD has taken the lead role of convincing 350,000 farmers to adopt conservation farming by 2015. Proven to increase yields, increase the storage of carbon, reduce deforestation, and improve long-term soil fertility, conservation farming focuses on farms in Zambia's maize and cotton belts. Of the 1.3 million farm households in Zambia, 200,000, or 15 percent, have so far adopted conservation agriculture.

The funding for this programme is bundled together with other Zambian environmental and agriculture projects, which Norway supports with between 100 million NOK (13 million Euros) and 174 million NOK (22 million Euros) each year. The program has trained 6,000 lead farmers in conservation methods, who in turn teach people in their regions. The lead farmers are paid with vouchers valued at US$80, which they redeem for agricultural inputs. Though mostly men are trained as the lead farmers, the majority of small farmers in Zambia are women.

The conventional way of farming, by digging whole fields with a hoe or oxen after the first rains of the season, destroys the soil structure. A crop is planted on the same plot year after year, after the soil is completely turned over, and fertilised only with harsh, acidifying nitrogen-phosphorus-potassium mixtures. The clay soils become acidic and lose their ability to hold water. Crop residues are burned. Families abandon plots and break virgin soil, adding to creeping deforestation in Zambia.

Conservation methods can restore these soils and maintain their health and fertility. The major difference of conservation agriculture is the minimum tillage, made possible by the use of a pointed Chaka hoe. The hoe is used to make holes in the soil where the seeds will be planted, rather than tilling over an entire field. Fertiliser is put in the holes with the plants, so it gets to the plants and less has to be used. Water, often a scarcity, can be directed into the holes where it is needed.

Fields of legumes are planted in between crops, to bring nitrogen into the soil and protein to family tables. The fields are prepared in the dry season, which helps prevent breakdown of the soil structure and allows seeds to be planted in the rainy season. An added benefit of conservation agriculture is that it is less time consuming, so women have more time. After about five years of conservation farming, the amount of time required to prepare a field drops by half. Most of the farmers who have adopted conservation agriculture live in semi-arid regions and cultivate maize, ground nuts and cotton.

PROJECT: Conservation Agriculture Programme
DONOR: Norway
HOST COUNTRY: Zambia
SECTOR: Agriculture
INVESTMENT: 100 to 170 million NOK (13 to 22 million Euros) annually, but figure includes other projects
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Greening tea

Dutch government funds hydroelectric plant for tea factory in Rwanda

As it has boosted its economy and worked to improve the quality of life since the 1994 genocide, the small East African country of Rwanda has promoted its high-elevation tea farms. Today, tea makes up 36 percent of the country's gross domestic product. But electricity, much needed for tea processing, is in short supply – and that will change. The tea estates lie at high elevations amid ample rainfall and constant river flows. These conditions, and the investment of the Netherlands, make micro-hydroelectric plants a viable option.

Rwanda and four other East African countries together grow 28 percent of the world's tea, but processing the leaves devours surprising amounts of electricity, using 8 kilowatt-hours per kilogram of finished tea. By comparison, that is more power per kilogram than is required for processing steel (6.3 kilowatt hours per kilogram). Often the tea factories run on polluting diesel generators because electricity flow is frequently interrupted. A solution boosted by European funders is micro-hydro power (MHP). Several funders have worked with the United Nations Environment Programme (UNEP) project, Greening the Tea Industry, to finance hydro systems near tea factories.

The UNEP has directed US$2.8 million from the Global Environment Facility to provide technical support for clean power in East Africa. It plans 19 projects in Kenya, Malawi, Rwanda, Tanzania and Uganda, and local banks are helping with nearly US$22 million, which will pay for six demonstration projects.

The Dutch government is working with Rwanda Mountain Tea to finance one of these, a US$7 million project. The Giciye hydropower project will be a 4.5-megawatt plant in Rwanda's Western Province, and its construction is expected to be completed in 2012. The plant will sell power to a national utility at a set feed-in tariff, but the tea factories will benefit from the lower-cost hydropower.

The Greening the Tea Industry project is a small aspect of the government's overall plan to extend and improve electricity. Only 7 percent of Rwanda's 10 million people have access to electricity, but the country is working to improve this while also promote itself as a hub for business. Capital projects to improve the electricity grid, boost solar sources, and build micro-hydro systems total more than US$700 million between now and 2020, the government has said. Rwandan President Paul Kagame has set a goal to grow through private investment. That includes tripling the amount of customers who can get electricity, to 350,000 customers.

The micro-hydro plant in Rwanda will replace about 4.7 tonnes of CO2e emissions per year, or 94 tonnes over the next 20 years, based on the amount of reduced diesel electricity that a diesel-generated plant would burn.

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The European Union contributes 80 percent of funding to UNEP.

Money multiplier

Green money, 2010 and beyond, includes fast-start financing and long-term funds that hold promise.

If one word could describe the development of the new phase of international climate finance that began in 2010, it would be the word "momentous." This so-called fast-start finance is momentous not so much because it has created enough funding to solve the climate problems — resources that have been committed so far to address mitigation and adaptation cover only 5 percent of the needs. Rather, it is momentous because it has a great bearing on the future. Fast-start finance is expected to have a multiplier effect for the available amounts of money mobilised for climate change mitigation, adaptation, and forest protection in developing countries. As well, it serves as a foundation for the development of the Green Climate Fund.

A result of the Copenhagen Accord, the fast-start financing mechanism was created by leaders of developed nations committed "to provide new and additional resources, including forestry and investments through international institutions, approaching US$30 billion for the period 2010 to 2012 with balanced allocation between adaptation and mitigation," according to the Accord.

The European Union committed 7.2 billion Euros for the fast-start financing, according to the UNFCCC. By November 2011, 4.68 billion Euros have been mobilized by the EU to meet its fast-start finance commitment, with 39 percent of the total to fund emissions mitigation projects to accelerate the transition to a low-carbon global economy and to reduce greenhouse gas emissions by promoting the deployment of clean energy technologies. Another 31 percent went to support adaptation efforts and 12 percent went to support action to reduce deforestation and forest degradation in developing countries. Because many activities supported are multipurpose in nature, 18 percent of the funding cannot be strictly categorized, according to an EU statement.

According to the allocations coming from Member State budgets, the amount is "allocated on the basis of national decisions. Despite the difficult economic situation and strong budgetary constraints, all 27 Member States and the European Commission are contributing to this funding," according to the EU's fast-start finance report to the UNFCCC.

In a 2010 report on world development published by the World Bank, the combined financing needs of developing countries for mitigation and adaptation was estimated at US$275 billion per year by 2030. Athena Ballesteros, of the World Resources Institute, has been tracking this climate finance architecture and the fast-start finance commitments and disbursements. In an interview, she said, "Combating climate change will require tremendous effort and ingenuity to mobilise resources at scale without delay."

Ballesteros also explained that the level of finance committed so far is only a small fraction of what is needed. She said, "Low-carbon investment in developing countries, at a level consistent with a global mitigation effort to stabilise greenhouse gas atmospheric concentration to 450 parts per million, could cost between US$139 and US$175 billion per year by 2030."

The main channels that involved funds from many countries combined, or multilateral channels, for fast-start funding include the Climate Investment Funds (CIF) of the World Bank and the Global Environment Facility. These and other multilateral funds account for 41 percent of fast-start investments. In 2010, the EU contributed 208 million Euros to the CIF and 108 million Euros to GEF.

A significant portion of the fast-start funds flow from one country to another, through bilateral channels. Countries generally do not give the allocation directly to another government; it is usually distributed by government agencies and development banks, such as the French development bank AFD. While 44 percent of EU's 2010 fast-start funds flowed through this way, bilateral funding as a whole comprised 61 percent of fast-start funding in 2010.

The strength of bilateral fast-start funds makes a lot of sense, explained Alexis Bonnel, of AFD. "It is generally easier for one country to come to an agreement with another country, unlike a multilateral agency where other elements of overall development assistance and many other factors are involved," Bonnel said. "We have been given a strong mandate for climate funding overall." Apart from fast-start money, climate change financing will be 50 percent of AFD's total commitments in 2011, or about US$8 billion.

According to Bonnel, France committed 1.26 billion Euros during the 2010 to 2012 period, or 420 million Euros per year, under the Copenhagen Accord, as a portion of the commitment made by the European Union (7.2 billion Euros). He explained that a significant share (80 percent in 2010) of the French contribution goes through AFD and the French Global Environment Facility. That money has already been dispersed to some 24 programmes around the world. For instance, one of the mitigation projects financed supports renewable energy development in Kenya. France will assist in Kenya's national policy framework to fund and support the Geothermal Development Company (see "Full steam ahead"). The French fast-start financing has also provided support for adaptation to the negative impacts of climate change actions. For example, in Morocco's Oudja City, residents will now have improved access to clean water and sanitation. Other funding has gone to REDD+, to support the sustainable management of forests in the Democratic Republic of the Congo.

Germany is a strong supporter for climate and environmental investments. Through 2011, Germany will have provided more than 1.4 billion Euros through its International Climate Initiative (ICI) administered by the Environment, Nature Conservation and Nuclear Safety Ministry. This program focuses on building capacity for and providing support to mitigation actions in a wide array of developing countries. CCAP's ICI project, the Mitigation Action Implementation Network (MAIN), in partnership with the World Bank Institute, brings together developing countries on a regional basis in Latin America and Asia to develop ambitious mitigation policy proposals. Much of this was distributed through the German bilateral development corporation, in the form of contributions to funds such as DIF, the Forest Carbon Partnership Facility, and the Adaptation fund. Additionally, Germany has said it will provide 350 million Euros to the REDD+ programmes. Germany's fast-start money supported 70 programmes, ranging from 125 million Euros for the Clean Technology Fund and a 100,000 Euro grant for a vulnerability assessment in southeast Asia, according to UNFCCC reports.

LOOKING AHEAD

The Green Climate Fund (GCF), which is expected to act as a conduit for long-term financing, is now being set into motion to help developing countries tackle climate change. While a final deal has not yet emerged, developed nations are working on ways they can jointly mobilise US$100 billion per year by 2020 to address the financial needs of developing countries for undertaking climate actions. The Council of the European Union in November concluded that "public and private flows are indispensable elements of climate finance and that the EU considers that "the large financial flows required to address climate change will, in the long run, be largely private in composition." While the GCF is being developed through a consensus-based multilateral approach, the donor community is considering establishing facilities that mirror, or closely resemble, the guiding principles of the GCF, as agreed upon by the international community. The advantage of maintaining this link to the GCF process is that it would allow the international community to see, firsthand, the results of various policy choices related to the design of the GCF. The establishment of bilateral facilities would also expedite the deployment of crucial financial support.

PHOTO CREDIT: MediaClubSouthAfrica.com

Renewables make gains

South Africa's plans for an innovative renewable energy financing initiative could help reduce emissions 34 percent

South Africa's propensity to droughts and flooding make it particularly vulnerable to the effects of climate change, and its growing economy's reliance on coal – 97 percent of the South Africa's electricity comes from burning coal – has made it a major contributor to global emissions. So, it is no surprise the country has set ambitious voluntary targets to reduce greenhouse gas emissions.

A new joint project of the South African Departments of Trade and Industry, Energy, Environmental Affairs, and Public Enterprises, the South African Renewables initiative (SARi) was established in 2010 to set up the financing and institutional capacity to enable development of a critical mass of renewable energy, without incurring unacceptable burden to South African taxpayers and consumers. In December 2011, the SARi plan will be launched with international partners at the the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP 17) hosted by South Africa in Durban.

SARi supporters believe that South Africa has the potential for at least 15 percent renewables in its energy mix. The objective of SARi is to realise this potential, which it considers a critical mass of renewable capacity, by 2020 to 2025.

"SARi presents a key element in ensuring that South Africa meets the emissions targets set by President Jacob Zuma who, at COP 15 in Copenhagen in 2009, committed South Africa to reducing its emissions trajectory to 34 percent below business as usual by 2020, and to 42 percent by 2025," Trade and Industry Minister Rob Davies said in a statement in October 2011. An integral part of South Africa's Industrial Policy Action Plan, SARi will help to develop capacity in related industries by designing a financial solution to encourage the roll-out of large-scale renewable generation capacity.

South Africa will be looking to use its international partnerships to help the country secure funding to enable an ambitious scale-up of renewables. The core challenge now is to fund the cost differential between the full economic cost of coal and an ambitious level of renewables.

SARi's original mandate was to "define an industrial strategy for securing the economic gains from an ambitious programme of renewables development, and to design and secure the financing and associated institutional arrangements." SARi enters the next phase of its existence in January 2012 as it prepares to put the initiative into action.

The Electricity Integrated Resource Plan (IRP) for 2011-2030 plans for 18 Gigawatts (GW) of renewable energy to be developed– accounting for 42 percent of all new generation.

Deputy Minister Tobias-Pokolo reinforced the South African government's key green industrial development priorities, speaking at a the Global Green Growth forum in Copenhagen, "Success for SARi would mean enabling the Integrated Resource Plan's targets for renewables to be met or exceeded, without painful costs neither to the fiscus nor to the consumer. This could create around 40,000 jobs, contribute up to 15 percent of South Africa's Copenhagen Commitment and decarbonize exports by up to 30 percent. Through SARi we are seeking to complement our contribution to global negotiations with immediate and practical domestic action and partnerships that will bring South Africa into the green race, creating the growth and jobs we need" the Deputy Minister concluded.

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PHOTO CREDIT: MediaClubSouthAfrica.com

Renewables make gains

GIZ helps South Africa make ambitious targets a reality

To help meet their emissions reduction goals and prepare for the impacts of climate change, the South African government approached Germany's Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) about a Climate Change Support Programme. After receiving 4.2 million Euros in funding from German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) in 2009, GIZ has been helping South Africa develop economic models to determine the best climate-policy instruments and assess the vulnerability of key sectors, among other initiatives, through a program that will last through 2012.

An early impact of the programme was the finalising of a Green Paper outlining South Africa's future climate strategy, for which GIZ helped both draft and build capacity.

Due to the broad scope of the project, "it is not possible to quantify the exact amount of carbon dioxide emissions which will be saved through the project," explained Dr. Irene Lukassowitz, of GIZ's Pretoria office, but "as we are supporting the government in achieving its ambitious objectives of reducing greenhouse gas emissions by 34 percent by 2020 and 42 [percent] by 2025...our support hopefully results in reaching these objectives."

DONOR: Germany
HOST COUNTRY: South Africa
INVESTMENT: 4.2 million Euros
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PHOTO CREDIT: MediaClubSouthAfrica.com

On the fast track

Fast-start financing jump-starts Dominican national strategy for 40 percent cut in emissions

In the Dominican Republic, the government's National Development Strategy hopes to improve the lives and livelihoods of Dominicans as well as at least double GDP per capita by 2030. But the country has recognized that this goal for economic success would raise GHG emissions by around 40 percent to more than 50 million tonnes of CO2e annually under a business-as-usual scenario.

As an island, and one in the potential path of increasingly destructive hurricanes, the country's motivations for reducing the impacts of climate change are clear. Through an integrated strategy, a Climate-Compatible Development Plan (CCDP) that was developed following the COP-16 meeting in Cancun, Mexico, in December 2010, the Dominican Republic hopes to prove that climate action and economic development can not only be pursued simultaneously but can be mutually reinforcing. Under the business-as-usual scenario, the CCDP examines four parts of the economy most responsible for 70 percent of all emissions and, thus, offer the greatest potential for mitigation: energy, transportation, forestry, and so-called "quick wins," which include cement, waste management, and tourism sectors.

This ambitious CCDP would see both GDP doubled and emissions halved by 2030, as well as inspire other countries to take on similar goals. And due to such factors as reduced energy consumption, most of the upfront investment in reduced emissions would actually yield significant economic benefits for the country.

Halving emissions would reduce the Dominican Republic's emissions by up to 65 percent of the country's projected business-as-usual 2030 emissions, or around 33 million tonnes of C02e.

These forecasts are based on the first stage of a CCDP that was released in January 2011 and drafted with 700,000 Euros in financial support from the German Ministry for the Environment's (BMU) International Climate Initiative as well as with technical support from the Coalition for Rainforest Nations. Those 700,000 Euros come out of the fast-start financing, and the objectives of the CCDP clearly line up with those of the fast-start program – to help developing countries adapt to the impacts of climate change and put them on a low-carbon development pathway.

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PHOTO CREDIT: KfW

Funding a forest

Norway, Germany work to reduce deforestation and achieve REDD goals in the Amazon

Emissions due to forest degradation in developing countries may contribute one-fifth of global CO2 emissions. Brazil, where much of the Amazon rainforest exists, is one of the top 10 emitters of greenhouse gases in the world, mainly due to deforestation of the Amazon. The forest is cut for timber, large cattle operations, and other farming activities.

About 358,408 km2 of Brazilian Amazon forest were cut between 1988 and 2007, an area that is 10 percent larger than Norway.

REDD (Reducing Emissions from Deforestation and Forest Degradation), a plan born out of the 2007 UN climate talks in Bali, proposed that developed nations, which benefit from forest products and contribute greatly to global CO2 levels, should pay developing nations like Brazil to implement sustainable forest practices. Brazil, together with Norway, embraced this idea and started the Amazon Fund in 2009. Norway agreed to provide up to US$1 billion (729 million Euros) through 2015. Of this, US$142 million will be allocated from Norway's Fast Start Financing Funds.

"Norway thinks that the actions to be financed by the Amazon Fund will contribute to a significant cut in emissions of greenhouse gases, as well as preserving biodiversity," said Inge Nordang, Minister Counsellor of the Royal Norwegian Embassy in Brasilia.

Brazil's President Luiz Inacio Lula da Silva had previously announced Brazil's commitment to reduce Amazon deforestation 80 percent below its historic baseline over 10 years, beginning in 2009. The Amazon Fund would be a major vehicle for trying to achieve this goal. The money would be used to encourage sustainable economic practices in the Amazon and also halt illegal logging through wider surveillance and law enforcement.

Norway and other donors make semi-annual payments to the Fund based on how much progress Brazil made the previous year reducing deforestation, in a pay-for-performance model. The amount of deforestation of the previous year is compared with a 10-year average baseline, revised every 10 years. This data, collected by the Brazilian National Institute for Space Research (INPE), mainly from satellite images, is converted by Brazil's Forest Service into the amount of CO2e per tonne that was avoided by the lower deforestation, using the formula of 100 tonnes of carbon per hectare.

Since 2004, the Amazon has seen a downward trend in deforestation, with the last two years having the most dramatic reductions. Between 1988 and 2008, deforestation each year varied from a high of 23,000 km2 to a low of 11,000 km2. In the year 2009, deforestation dropped dramatically to 7,000 km2, and further in 2010 to about 6,000 km2.

Norway gave US$122 million in 2009 and US$146 million to the Amazon Fund in 2010. In 2009, Germany, too, became a donor, with a pledge of US$28 million. Germany also contributed US$17 million, in 2009, and US$13 million, in 2010.

It is estimated that if Brazil reaches its deforestation goal, 4.8 billion tonnes of CO2e will have been avoided in the 2006-2017 period, based on an estimate of 100 tC/ha.

"The Amazon Fund would not have got off the ground without the willingness of the Norwegians to take leadership on its creation and, more broadly, the REDD process. Leadership did mean, in part, putting money on the table at sufficient volume to place the Amazon Fund itself in a leadership role," said Simon Zadek, Senior Fellow of the Global Green Growth Institute.

Any public or private organization, from local organizations, to crime fighting entities to university researchers can apply for funds. In 2009, its first year, the Fund gave money to eight projects worth US$60 million. They included five NGO-run projects, plus three state- and municipality-run projects.

PROJECT: REDD
HOST: Brazil
DONORS: Norway, Germany
SECTOR: Forestry
INVESTMENT: US$1 billion from Norway; US$58 million from Germany
CO2E REDUCTIONS: 4.8 billion tonnes
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PHOTO CREDIT: CIAT International Center for Tropical Agriculture

Donor darling

A well-organised group of ministries attracts EU financing

The way players organise themselves on a field plays a large role in whether a team will win or lose a football game. In many ways, the same is true for governments. Consider developing countries and their ability to create and implement Nationally Appropriate Mitigation Actions (NAMAs), and then acquire international financing for these efforts. A government must bring together players – the ministries of environment, finance, planning, and energy, among others – to organize a concerted effort to collaborate on the important components, which then leads to a NAMA development.

NAMAs are a set of actions which can take form as policies, measures, and projects that countries voluntarily undertake in the context of sustainable development. They can be implemented unilaterally (autonomously) or with financial support from industrialised nations, , under the condition that the actions and the support are monitored, reported and verified (MRV) domestically and will be subject to an international MRV process. NAMAs first emerged from the Bali Action Plan in 2008, and later formed part of the Copenhagen Accord in 2009. Since then, countries have worked to develop coordinated efforts for NAMAs. No countries have yet implemented NAMAs, but a precursor to the idea is the Programme of Activities of the Clean Development Mechanism, with a main difference being that emissions reductions from unilateral and supported NAMAs do not earn credits but are instead counted towards the host country's climate goals.

Colombia's level of organization stands out as a success story, as it has developed international support for a variety of NAMAs studies, which will be assessed at the end of 2011. Through clearly articulated roles among the relevant ministries, Colombia advanced action on climate change while also proposing a structured relationship between the government and myriad outside funders and programmes acting in the country. This general coordination has meant, for example, that cities can work together with the Ministry of Transportation or planning department to promote sustainable development for urban transportation systems, for example. As well, international finance to support such efforts can pass through the Ministry of Finance or implementing agencies.

In 2011, the Council on Economic and Social Policies (CONPES), led by the president, released a policy document creating Colombia's National Climate Change System (NCCS), the country's institutional setting for climate change. The NCCS seeks to coordinate all relevant initiatives on climate change and allocate resources for activities such as NAMAs. The system will be led by a new high-level national climate change commission comprising relevant ministers. These ministry leaders are now mandated to participate in the design of Colombia's Low-Carbon Development Strategy (LCDS) and identify NAMAs, forestry projects, and adaptation efforts. Below this high-level commission is a lower-level Inter-agency Technical Committee for Climate Change, created in 2009, which first and foremost analyzes Clean Development Mechanism (CDM) projects seeking national approval from the Ministry of Environment.

Colombia's latest four-year National Development Plan, approved by Congress in May 2011, specifically addresses low-carbon strategies such as a commitment of resources to building the Bogota transportation system. In addition, the country's full low-carbon strategy is expected in summer 2012 and will formulate long-term climate policies.

This effective government structure and coherent climate strategy has helped, in part, to make Colombia a "donor darling," having attracted the support of over 12 funders and organizations on climate-related activities. These include bilateral funders like the U.S. and Germany; multilateral organizations like the World Bank, the Inter-American Development Bank, and the UN Development Programme; and organizations like World Resources Institute and the Center for Clean Air Policy.

Outcomes from funds delivered to date—mostly directed at studies, technology needs assessments, identification and prioritization of NAMAs, capacity building, LCDS facilitation, feasibility of market strategies, and institutional strengthening—will be in the form of more effective, salable and better-executed NAMA.

Funding outcomes are invisible for the moment, because funding has been mostly directed at studies, technology needs assessments, identification and prioritization of NAMAs, capacity building, LCDS facilitation, feasibility of market strategies, and institutional strengthening.

Colombia's high-level commission will assess at the end of 2011 the results of NAMA studies being carried out. While Colombia does not have actions officially stated as NAMAs yet, it has "pre-identified" NAMAs in the following areas: 1. mining and energy (renewable energy incentives, geothermal, energy efficiency); 2. transportation (shift from road freight to river, fleet renewal, transport-oriented development, etc.); 3. agriculture; 4. forestry; 5. waste; and 6. industry, including engines, boilers, fuel switching, and clinker substitution. A final package of specific mitigation options and legislative changes is due by summer 2012.

On a high wire

France finances Medellin cable car program to improve transportation, reduce emissions

For years, the Colombian capital, Bogota, has been striving to develop a more sustainable transportation system within the city, and in the process has earned itself international praise for its success in developing a bus rapid transit system, bike corridors, and restrictions on private cars. So it seemed like only a matter of time before the country's second-largest city, Medellín, began to green its own transportation system.

In 2006, Medellín opened Metrocable to link the hillier parts of the city to its metro system. The success of that tramway, also known as a gondola lift or cable car – as well as the two additional tramway lines that have been built since then – provided primarily lower-income hilly neighborhoods with a faster, safer, cheaper, and cleaner way to get into the city center and to the rest of Medellín.

In 2010, following these successes, Medellín received US$250 million in loans from France's AFD to finance another tramway that will link the neighborhoods east of the city center to the rest of the public transportation system. This Ayacucho tramway is scheduled to be completed in 2014 and will help the city continue to pursue its goal of an integrated and sustainable transportation network. The new lines will also aid in Colombia's broader efforts to identify and develop Nationally Appropriate Mitigation Actions – an effort in which international funding has been key.

In addition to local benefits like construction jobs, reduced health problems from air pollution, and easier commutes, enabling residents to shift away from using private cars, taxis, and older buses will have global benefits. The tramway extension is estimated to reduce emissions by on average 15,511 tonnes CO2e each year between 2010 and 2013.

The Swiss organization myclimate has also been instrumental in the Ayacucho tramway project by developing it as a CDM project – called Cable Cars Metro Medellín, Colombia – so that the carbon offsets it generates can be sold.

PROJECT: Cable Cars Metro Medellín
DONOR: AFD / myclimate
HOST COUNTRY: Colombia
SECTOR: Public transport
INVESTMENT: US$250 million
CO2E REDUCTIONS: 62,047 tonnes
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PHOTO CREDIT: myclimate

Lighting Africa

Europe rallies to assist in ambitious target for sustainable off-grid lighting

About 600 million people in Africa, or 70 percent of the population, live in energy poverty and do not have access to the grid. So, when the sun goes down, they use kerosene lights or candles to illuminate the night. These fuel-based lights are not only unhealthy because of their smoke – especially if used inside – but are also unsustainable, inefficient, and expensive.

Lighting African is an effort to provide cleaner, sustainable lighting to Africans through light-emitting diodes (LED) or solar-based lighting, which are not only environment-friendly but also usable without being connected to the power grid.

Many households in Africa spend 10 to 30 percent of their income on kerosene fuel.

As a group, Africans who are not connected to the electricity grid spend a huge amount of money on kerosene light, about US$10.5 billion. The Lighting Africa programme will help generate a market for sustainable, off-grid light products. Besides the humanitarian aspects of alleviating the burden of high fuel costs, greenhouse gas emissions caused by the kerosene would decrease.

The project is financed with US$6.9 million from the World Bank and the Public-Private Infrastructure Advisory Facility (PPIAF). In a first phase, PPIAF provided US$1 million for developing innovative lighting. These investments have also mobilised the private sector to build sustainable markets for off-grid lighting, including distribution networks, and purchase and loan programmes

Every new lighting product has to pass a quality test by the PPIAF Lighting Africa initiative to make sure they meet the requirements, which include sustainability and durability metrics. In a second phase, US$350,000 was provided to analyse policy and regulatory barriers.

After pilot projects in Kenya and Ghana, the project has expanded to Ethiopia, Mali, Senegal, and Tanzania.

More than 190,000 solar lamps have been sold in Africa since 2007, providing more than 1.5 million people with improved lighting. The goal is to make sustainable lighting accessible to 2.5 million people by the end of 2012, and accessible to 250 million by 2020.

PROJECT: Lighting Africa
DONOR: PPIAF and World Bank
HOSTS: African countries
INVESTMENT: US$6.9 million
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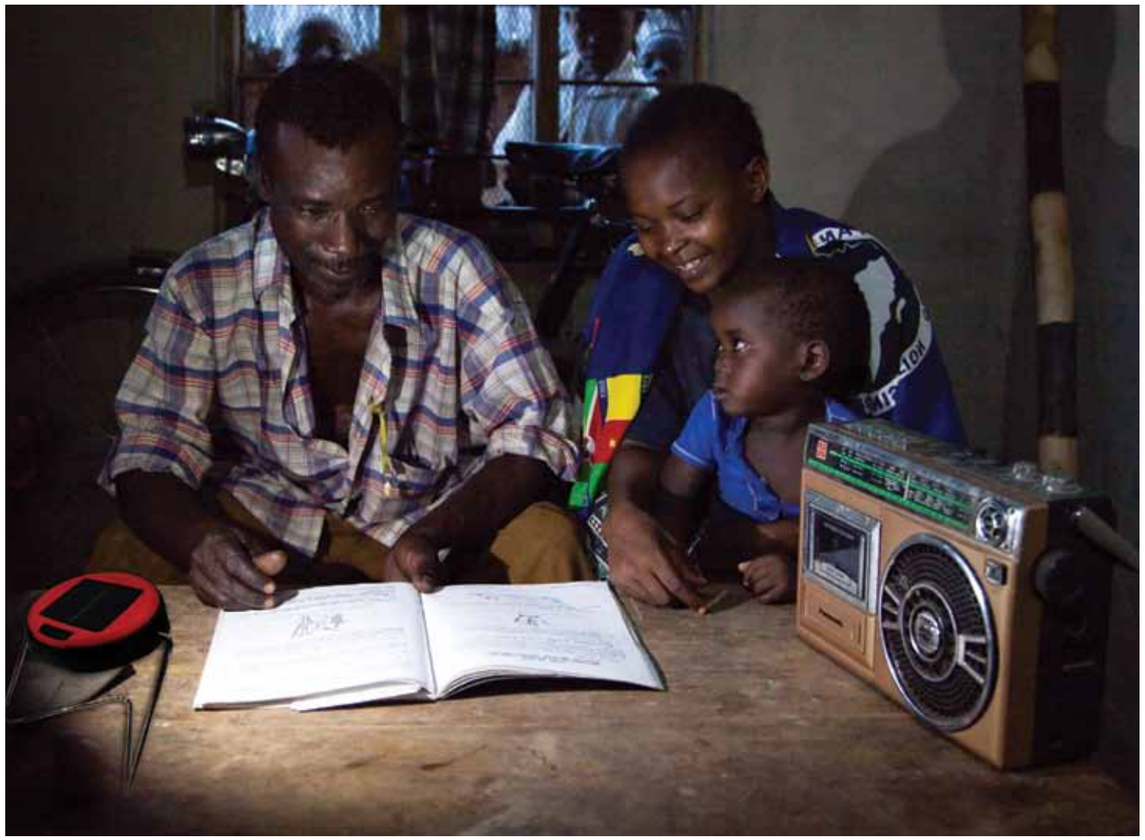

Energized future

Germany's investment in energy development improves energy access to the rural poor in Bolivia

Access to energy can enrich lives, and this can be clearly seen in Bolivia. Pedro Huayllas is among the thousands of Bolivians who are benefiting from a 10 million Euro energy development programme financed by Germany and The Netherlands to improve access to energy for households, social institutions, and farms. "Our way of life has improved a lot since we got electricity," said Huayllas, a 75-year-old farmer living in rural Bolivia, who says he and his wife have light now for reading in the evenings.

In 2005, 68 percent of Bolivians had access to electricity — the lowest rate in Latin America; just 30 percent of Bolivians in rural areas had access to electricity. In these rural households, 80 percent of the total energy consumption is biomass, which consists mainly of fuel wood used in cooking. For social institutions, such as hospitals and schools, lack of electricity has severely limited their services and reduced standards in patient care.

To improve the lives of Bolivians, a Dutch-German partnership, Energising Development in Bolivia (EnDev Bolivia), aims to provide access to modern electricity for 385,500 people and 1,450 social institutions by 2012. The project will also give access to improved cook stoves for 156,500 people and 3,500 institutions. And, for the rural farmer, EnDev Boliva will assist in the distribution of small-scale solar pumps for low-cost sustainable irrigation and for energy to be used for processing crops, such as efficient methods of peanut roasting.

By the end of 2010, approximately 200,000 people and 1,000 social institutions had gained access to electricity. More than 40,000 of those Bolivian families have electricity due to a new policy, called Electricity for Decent Living, developed in cooperation with GIZ and the Bolivian ministry, that was designed to improve access to electricity.

EnDev Bolivia also supports municipalities with the planning, designing, and installing of photovoltaic and thermal solar systems for schools and hospitals, financing up to 40 percent of the technology costs. The programme also trains up to three people in each institution to maintain the system. More than 90,000 people and 1,900 institutions are using the improved cook stoves that have been disseminated to rural areas, reducing fuel costs by more than 50 percent and reducing indoor air pollution. In addition, 3,500 farmers, including farmers like Huayllas, are benefiting from the use of energy in growing and harvesting crops. The producers' association has said that some regions were able to improve incomes by 200 percent due to energy-efficient methods of drying and processing peanuts.

While the project is still under way, EnDev Bolivia reports that interest in the programme remains high. A number of government, NGO, and private institutional partners are working with EnDev Bolivia to coordinate activities in the country. For instance, EnDev Bolivia uses a financial mechanism that helps cover the costs of connecting end users to the electric grid by offering a subsidy for the connection.

EnDev Bolivia is part of a much larger EnDev effort worldwide to provide sustainable access to modern energy services for 5 million people, with 21 different activities in 22 countries.

PROJECT: Energising Development in Bolivia
DONOR: GIZ (Germany and The Netherlands)
HOST COUNTRY: Bolivia
SECTOR: Energy
INVESTMENT: 10 million Euros
CO2E REDUCTIONS: n/a
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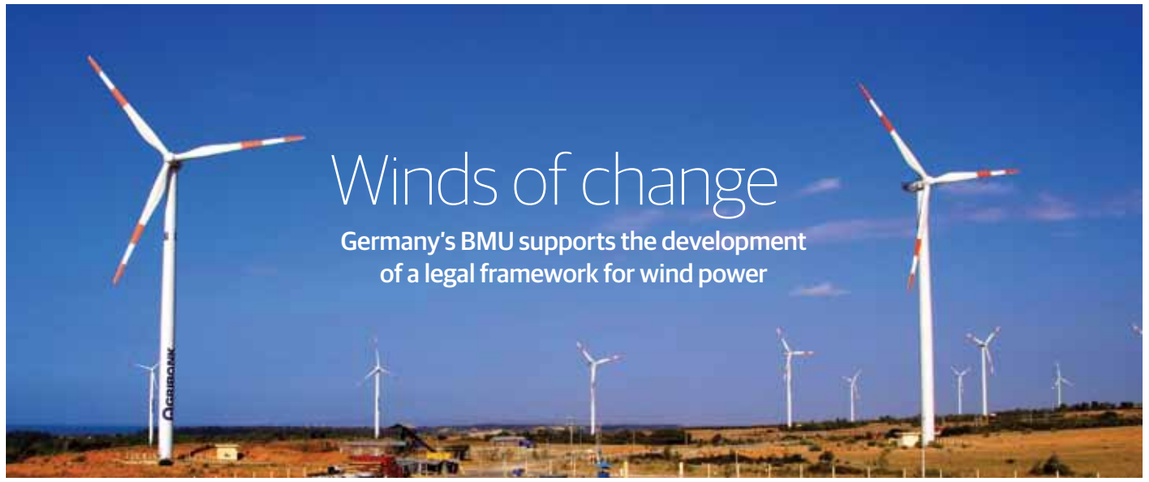

Winds of change

Germany's BMU supports the development of a legal framework for wind power

Vietnam may be known for its densely forested mountains and its crisscross maze of rivers in the Mekong Delta, but only a few people know that the country – with its 3,000 miles of coastline – also features excellent conditions for wind energy. Estimates on Vietnam's wind power potential vary, but according to a World Bank report, it could be as much as 521 gigawatts (GW).

Two prime locations for wind power are Binh Thuan and Ninh Thuan provinces, which have the potential to generate more than 8,000 megawatts (MW) of electricity through wind power. Approximately 8.6 percent of the country's total land area is evaluated to have "high" to "very high" wind energy potential. But while the strong, steadily blowing winds on its coast have already made Vietnam a top destination for wind surfers, the country still needs to develop its wind energy sector.

Vietnam's current energy mix is heavily dependent on coal, gas, and hydropower. Furthermore, the country's electricity demands are expected to increase at a rate of 10 percent per year until 2030. With Vietnam's energy economy drastically changing due to industrial, transportation, and residential energy demands, this poses new challenges for Vietnam to meet looming energy needs and to diversify the mix of energy sources.

In order to encourage wind energy generation in Vietnam, the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) has commissioned the project "Establishment of a Legal Framework and Improvement of Technical Capacities for Grid-Connected Wind Power Development in Vietnam." The project is executed by the Vietnamese Ministry of Industry and Trade (MoIT) with support from the German development organisation GIZ (Gesellschaft für Internationale Zusammenarbeit). June 21, 2009, marked the commencement of this partnership, a 1 million Euros (US$1.47 million) commitment by Germany, which aims to remove the barriers to the Vietnamese wind energy market, and is focused on establishing the legal framework for grid-connected power, wind power planning, capacity development and consulting services, and wind measurement.

"We follow a comprehensive approach that, in the long run, will produce substantial environmental as well as social and economic benefits," said Ms. Angelika Wasielke, Chief Technical Advisor of the GIZ Wind Energy Project. "Last but not least, our work contributes to reducing CO2 emissions. A 15 megawatt wind park avoids the 45,000 tonnes of CO2 emitted annually by a comparable new-build coal-fired power plant. In addition, it can prevent local environmental damage, such as the leaching of diesel and lubricants into soil."

The Vietnamese government in June 2011 introduced a feed-in tariff on wind power projects. The tarrif obliges the country's sole power distributor, state-owned Electricity of Vietnam Group (EVN) to pay 1,614 VND (about 7.8 US cents) for 1 kilowatt hour (kWh). "This was an important step for wind energy in Vietnam," said Wasielke. "It was the first time that Vietnam implemented a financial support mechanism for producers of renewable energy. But the success of this decision will depend on its effective and transparent implementation."

Despite the enormous wind power potential, the lack of a regulatory framework for private investors to invest in wind projects has created a barrier for wind installments in Vietnam. The general director of Vietnam's Ministry of Energy, Pham Manh Thang, said that renewable energy would play a critical role in the country's energy development but that investors were still faced with difficulties due to the lack of a national master plan and legal framework.

Even though there are currently 42 wind power projects with total capacity of 3,906 MW being developed, most of them are a long way away from becoming operational. So far, only one grid-connected wind power project has become operational: 20 wind turbines with capacity of 1.5 MW per turbine have been installed and connected to the national power grid by Vietnam Renewable Energy Joint Stock Company (REVN).

"Together with our partners, we have achieved tangible results," stated Angelika Wasielke, "but in order to make wind energy successful in Vietnam and attract the urgently needed investments, there is still a lot of work to be done in the sector."

PROJECT: Development of wind energy industry
DONOR: Germany
HOST COUNTRY: Vietnam
SECTOR: Renewable energy
INVESTMENT: 1 million Euros
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PHOTO CREDIT: GIZ

Building a green Mauritius

Strategies transform renewable energy mix and catalyse green investment to build a sustainable island

With 83 percent of its energy coming from imported fossil fuels and the cost of petroleum continuing to rise – as well as rising sea levels threatening its very existence – the small archipelago of Mauritius has developed a Long-Term Energy Strategy with a target of increasing its renewable energy mix to 35 percent by 2025. Currently, renewables account for 17 percent of energy production, with the vast majority from biomass made from bagasse, the leftovers from processing sugar beets. Just 3.7 percent of renewables come from wind, and 3.3 percent is from fuel wood.

The Long-Term Energy Strategy seeks to develop and promote grid-based solar photovoltaic generation and the policies and feed-in tariffs to support its expansion. Under a project called Removal of Barriers to Solar Photovoltaic Power Generation in Mauritius, Rodrigues and the Outer Islands, United Nations Development Programme (UNDP), with US$2.01 million from the GEF, is helping the Ministry of Energy and Public Utilities do just that.

The solar project, which will last for four years, is an offshoot of a plan meant to remove barriers to energy efficiency that began in 2008. That plan resulted in, among other accomplishments, the country's first grid code and a pilot feed-in-tariff (FiT) scheme launched in late 2010. That scheme was already 80 percent subscribed within the first six months. The solar photovoltaic project will significantly expand the FiT scheme.

The expected reduction in CO2e from this project is about 13,295 tonnes over the project's four years and about 98,000 tonnes over the full lifetime, assuming 3 MW is brought onto the grid, according to Shakil Beedassy, UNDP project coordinator for Mauritius. Beedassy also noted that it is possible a greater megawatt capacity could be brought on due to the falling price of PV technology.

France's AFD has also financed a 40 million Euro credit line for green projects, in partnership with four local banks, to build on the projects' capacity to drive and catalyse green investment decisions. In September 2011, nearly 40 percent of the credit line has been committed for 18 projects, and several other projects are under consideration – including wind energy and an ethanol factory. These projects will support private investment in sustainable energy and the environment. AFD also contributed US$100,000 to the energy efficiency project, and the private sector has provided another US$17.5 million in funding to the solar photovoltaic project, among other commitments.

European Union contributions to UNDP totaled nearly 300 million Euros in 2010.

Advice brings change

Electricity management advice for Nigerian ministry of power

In the small village of Kano, in northern Nigeria, Badamasi Maiwalda has struggled to earn a living to support his wife and their two children. As an iron-bender, he earns the equivalent of 1.2 Euros per day. Due to frequent outages, the flow of electricity is sporadic. Power output averages an hour per day. This has made Maiwalda's ability to earn a living difficult, as he has been unable to save for a diesel generator to supplement his electric supply.

But Maiwalda's hard luck with intermittent electricity will soon change. With assistance from the UK's Department For International Development (DFID) to provide management advice to Nigeria's Ministry of Power, electricity output is being increased nearly fivefold from 4 GW to 15 to 20 GW by 2015, and 40 GW by 2020.

Nigeria is Africa's most populous country, with 155 million people. But only 40 percent of them have access to power, even though it is a fossil-fuel-rich nation. The need for infrastructure improvements is evident with frequent power losses. Recently, however, the flow of energy has improved. In 2010, a power sector improvement blueprint included the privatisation of the state-run electricity generation and distribution facilities.

New efforts by the federal government promote the development of renewable energy in the country. And, a National Energy Policy now includes a renewable-energy master plan as well as a biofuels policy.

PROJECT: Nigeria Infrastructure Advisory Facility
DONOR: United Kingdom
HOST COUNTRY: Nigeria
INVESTMENT: 19.5 million UK pounds
SECTOR: Energy
PRESS CONTACT: pressoffice@dfid.gov.uk

Obstacles removed, solar energy flows

GEF support removes barriers, brings access to electricity for 27,000 households

Although Namibia is the driest country of sub-Saharan Africa, it is fortunate to receive an abundant amount of sun year-round. Namibia receives just under 4,000 hours of sunshine a year (this equates to about 11 hours of direct sunlight a day) and has the largest solar energy potential in southern Africa.

Recognising its potential in the deployment of solar power, Namibia's Ministry of Mines and Energy launched a rural electrification programme, called the Namibian Renewable Energy Programme (NAMREP), in 1990. This has spurred results in some areas. Since then about 400 rural towns, villages, and settlements have been grid electrified, and an estimated 8,330 households have benefited from the electrification programme. However, due to a highly dispersed settlement structure, low household incomes, relatively low energy demand, and the inability to extend the grid to Namibia's most remote corners, many rural settlements remain without electricity.

Currently Namibia's on-grid energy mix is derived from coal, diesel, and hydropower, and in 2005 only one-third of Namibia's population had access to electricity (67 percent for urban areas and 10 percent for rural areas). Of Namibia's 2,855 rural settlements, some 131 settlements are designated as off-grid, meaning that some 27,000 households will not have access to the national grid for at least 20 years. Off-grid power is heavily dominated by petroleum (66 percent); biomass makes up 9 percent and solar power was barely evident.

Despite these fallbacks, Namibia has been able to expand its off-grid renewable energy potential through assistance from the Global Environment Facility (GEF). The GEF and UNDP have partnered with the Government of Namibia to provide a loan and implement projects aimed at driving economic, social, and environmental development. The objective is to promote the adoption of renewable energy by removing barriers and reducing implementation costs through five major mechanisms: 1. capacity building in the public and private sectors and in NGOs; 2. establishing a framework of policies, regulations, and actions in support of renewable energy and off-grid electrification; 3. increased public awareness and social acceptability of solar energy technologies; 4. the establishment of innovative financing and product delivery schemes; and 5. the development of learning, evaluation, and adaptive management models.

Already successes of the project have advanced sustainable development vis-à-vis off-grid solar lighting; solar powered home electronics, such as radio, TV, and refrigeration; and solar powered water pumping. Since the inception of Phase I of the NAMREP program in 2004, a market for solar energy technologies (SETs) has emerged. Sales of SETs between 2001 and 2004 averaged 372 systems a year. More than double that number – 823 systems – were sold in 2005. Further, it was projected that sales would rise to 1,392 systems in 2006. Moreover, the first phase of the project provided the exchange of technical assistance to achieve capacity building in government, NGOs, and financial institutions; broadened public awareness; and reduced technological barriers.

At the local level, technical assistance was exchanged through training programmes for the public and private sectors and NGOs to promote, finance, install, and maintain solar applications. Furthermore, GEF assisted in developing and implementing a policy framework for off-grid solar. It also facilitated the establishment of regional and local financing activities with local banks, and guided the institutionalisation of other financial mechanisms that would spur growth and enhance financial security in renewable energy lending practices.

Moving forward, Phase II of the project, implemented by UNDP, will continue to address the capacity building efforts and overcome awareness and institutional barriers. Additionally, a larger focus will support innovative loan and grant mechanisms to advance the ability of the project to grow to a much larger scale of effort into other settlements.

Overall this project (phases I and II) will reduce 233,700 tonnes of CO2e over a 15-year period with a total GEF investment of US$5.2 million. The indirect CO2e emission reduction due to replication is an estimated 2.1 million tonnes.

Namibia is keen on creating incentives to kick-start a competitive and formal solar energy sector. With a strong supportive energy policy, solar regime, and compact institutional environment, the government can build on its current efforts to replicate projects nationwide.

PROJECT: NAMREP
DONOR: GEF
HOST COUNTRY: Namibia
SECTOR: Renewable energy
INVESTMENT: US$5.2 million
CO2E REDUCTIONS: 233,700 tonnes
PHOTO CREDIT: Rui Ornelas

European Union contributions to UNDP totaled nearly 300 million Euros in 2010.

On the edge

Denmark, Norway, and Germany help clear path for sweeping adoption of solar energy and efficient cook stoves

Many people in rural areas of Nepal lack access to clean, cheap, and reliable energy. Nationwide, just over 40 percent of Nepalese have access to electricity. To help alleviate poverty and promote rural development, Nepal created the Alternative Energy Promotion Centre (AEPC) in 1996 to deliver alternative energy systems to Nepal's rural population.

By 1999, it was clear that the center, which worked with solar energy, micro-hydropower, biogas, improved water mills, biofuel, and improved cook stoves, was very popular and needed more financial support to meet demand. Denmark (DANIDA) stepped up and gave 154 million DKK, and the Energy Sector Assistance Programme (ESAP) was born. With its support, 1.5 million people benefited, despite a raging armed insurgency under way and ongoing political instability.

The solar home systems are built, sold, and installed by the private sector, and typically are used to provide light. ESAP provides subsidies for installations that are proportional to a household's distance from the grid. The household still pays the majority of the cost. Micro-hydropower plants are village-based and more involved to install. This hydro-energy provides enough power to light homes, plus run a radio and small equipment.

In 2007, Norway provided 147.4 million NOK to AEPC; DANIDA, an additional 150 million DKK; and Nepal, an amount equal to 554 million NPR, toward a total budget of 4.9 billion NPR. Recently, Germany provided 8.5 million Euros. The program became ESAP II, and its goal was to reach 1 million rural households with affordable, alternative energy systems by 2012.

By December 2010, or 32 months into the program, ESAP II had installed 157,000 solar home photovoltaic systems, 191,020 mud-brick improved cook stoves, 3,050 metallic stoves, and 9,000 small solar home photovoltaic systems. It commissioned 2.5 MW from micro-hydropower plants, which provided electricity to 63,000 households. ESAP II also assisted on the policy level and helped the government of Nepal build a subsidy policy for alternative energy systems.

According to NORAD estimates, the micro-hydropower plants reduced CO2e emissions by about 5,000 tonnes per year.

PROJECT: ESAP I and II
DONORS: Norway, Denmark, Germany
HOST COUNTRY: Nepal
SECTORS: Renewable energy, energy efficiency
INVESTMENT: 254 million DKK (DANIDA gave 154 million + 150 million = 304 million DKK), 147.4 million NOK, 8.5 million Euros
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High potential

Darfur Alternative Energy Project is breaking a cycle of conflict and environmental degradation

Environmental degradation has been both a cause and a result of the armed conflict that has plagued parts of Sudan for years and displaced numerous inhabitants. This has led to rapidly increasing urban populations in the country. This urbanisation, in turn, has resulted in unsustainable demand for fuel, particularly the timber needed for fuel wood, charcoal, and brick-making, which has exacerbated environmental problems like deforestation – thus again increasing the likelihood of further conflict or impacts resulting from climate change.

To end this vicious cycle, UNEP is working with the government of Sudan to develop long-term plans for sustainably utilising its natural resources as it recovers from years of conflict. One of the initiatives within this work is the Darfur Alternative Energy Project, which is assessing the potential for and promoting new energy sources in the region. The project's aim is to reverse deforestation, as well as reduce emissions of CO2 and other air pollutants.

Fabian Kreuzer works for UNEP in Khartoum, Sudan, and is researching the alternative energy options that are feasible in Darfur. "The alternative energies that are most promising in Darfur are liquefied petroleum gas for urban centers and fuel-efficient stoves in rural settings," said Kreuzer. "The production of bricks that do not need to be fired in ovens during production is a promising solutions and needs to increase largely." Kreuzer added that some experimentation with solar power for water pumping is being done.

As further context, Kreuzer said that in other locations, such as Ghana or India, fuel-efficient technologies like stoves are achieving widespread adoption through the private sector, but this scale-up has not yet occurred in Sudan.

Though no information on the expected emissions reductions of the project could be obtained, the principle benefits are the reduction of deforestation, which has reached an alarming 2.2 percent per year. (It was 0.7 percent per year before the forest-rich South seceded).

In addition to identifying and introducing alternative fuels, UNEP is also working to strengthen community-based management of natural resources. UNEP's earlier work in Darfur on timber and energy saw the planting of two million trees.

The alternative energy project began in 2010, with the first stage implemented in partnership with ProAct Network. The programme comes under the umbrella of UNEP's broader work in Sudan, the Sudan Integrated Environment Program, which has benefited primarily from 20 million UK pounds from the UK's Department of International Development's UKaid as well as financial support from Italian Development Cooperation and USAID.

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PHOTO CREDIT: UNEP

The European Union contributes 80 percent of funding to UNEP.

On climate front lines, nation seeks renewables

Financing from EU, GEF helps add 1,700 solar household systems, develop biofuel industry

The tropical archipelago that comprises the Republic of Marshall Islands — some 1,225 islets — is splayed across a 1.3 million square kilometer expanse of the western Pacific and forms two parallel island chains. On Majuro, where 50 percent of the 54,000 Marshallese live, is the main commercial airport. And in the Kwajalein Atoll, the location of a U.S. military base, is the compact urban center of Ebeye, with a population density higher than Hong Kong's. No matter where one visits, chances are good that both the ocean and a solar panel are somewhere in sight.

Although this small island nation has not contributed much to climate change, it is taking action to mitigate carbon emissions through a comprehensive national renewable energy system entitled Acting for the Development of Marshall Islands Renewable Energy (ADMIRE). ADMIRE was adopted in 2009 in response to the 2008 energy crisis, which severely raised energy costs for residents who are dependent on fossil fuel. The European Union and the Asian Development Bank supported the development of ADMIRE. In 2010, the Marshall Islands further pledged to cut emissions by 40 percent below current levels by 2020.

Two-thirds of the country's population lives in the two urban population centers of Majuro and Ebeye, and the rest is widely dispersed among 25 atolls. The renewable energy policy will help the Marshall Islands meet its growing urban electricity needs, improve efficiency, reduce its reliance on imported fossil fuel — mainly diesel for generators and kerosene for cooking and lighting — and bring reliable energy to 2,000 households in the outlying island chains.

Through a US$1 million GEF Trust Fund grant, administered through the UNDP, and US$1.65 million in co-financing, the Marshall Islands is improving access to renewable energy. The plan has also developed the viability of biodiesel fuel made from coconut, the main agricultural industry in rural areas of the Marshall Islands.

Espen Ronnenberg, Climate Change Advisor for the Secretariat of the Pacific Region Environment Program Programme, underscored the importance of international support for the energy plan. "It is evident that without the international finance and technical support, this project would have taken much longer to get off the ground. It provided the necessary hands-on training in installation and maintenance, which are very important components," he said. "Its impact in these outer islands is also impressive, as for the most part there were only diesel generators operating, but sporadically."

Under the plan, the Marshall Energy Company is administering the installation of solar home systems to 1,700 households and to schools in outlying islands. Residents can buy the solar systems, or they'll be able to rent them for US$8-12 per month. This payment is not an extra expense; rather, it replaces battery and kerosene expenditures that amount to a minimum of US$13.30 per month. Renewable energy loan financing is being developed with local banks.

Biofuels are another component under ADMIRE. The biofuel is made from the oil of coconuts, called the "tree of life" in the Marshall Islands. Marshallese dry the coconuts to make copra, which is converted to coconut oil. The sale of copra is a major source of income for families living in rural areas. The coconut biofuel is substituted for diesel to run generators, reducing dependency on diesel that's used to synergistically power small generators that operate high-load appliances like refrigerators.

The GEF financing builds on previous renewable energy grants and initiatives from a wide array of European organisations. For instance, in the 1990s France supported a solar energy effort in select outlying islands. The European Union, too, has supported the Energy Sector in Five ACP Pacific Island Countries (REP-5) programme, which gave 2.3 million Euros to the Marshall Islands for renewable energy in rural areas, including 416 households and schools in Ailinglaplap for solar electrification. And, the UK-based organisation Climate Care has provided 10,000 energy-efficient light bulbs, which were distributed to government buildings, schools, and houses that are connected to the electricity grid in Majuro and Ebeye. The Marshalls Energy Company estimated that the use of these light bulbs reduced fuel demand and saved US$150,000 annually.

"Now there are lights for the school kids in the evening," said Ronneberg. "There is refrigeration for their fish catches, so [they don't] spoil while waiting for transport to the export port. There is much better services for the community through affordable and reliable electricity. But it was also a project with determined support both from the community as well as highest level of Government."

A strong renewable energy policy has improved access to electricity for this small island developing nation and reduced reliance on expensive imported fuels, which has offset carbon emissions due to burning fossil fuels. The government has further developed a Climate Change Roadmap 2010 and NAMAs, which outline areas of possible fast-start finance, including adaptation and mitigation projects that can be implemented under an already existing strong set of plans. The Marshallese are obtaining the economic and environmental benefits of reduced fossil fuel reliance while also improving access to energy, increasing energy security, and developing a plan to adapt to climate change.

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Village curbs dependence on coal
Project: Haiyuan Solar Cooker Project
Donor: myclimate
Host country: China
Sector: Thermal energy
CO 2e reductions: 33,500 tonnes annually
Press contact: Kathrin Dellantonio, myclimate
E-mail: info@myclimate.org
Photo credit: myclimate

France takes aim at low-carbon housing
Project: Low carbon housing
Donor: France
Host country: China
Sector: Housing
Investments: 5.9 million Euros plus additional financing from AFD
CO 2e reductions: 500,000 tonnes
Press contact: Laure Weisgerber, Communications Division, AFD
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Policy, finance become catalyst for change
Project: Energy conservation and GHG emissions reductions in China's township village enterprises, Phase II
Donor: GEF, which receives more than a third of its funding from Europe
Host country: China
Sector: Energy efficiency
Investment: US$8 million
CO 2e reductions: 1.3 million tonnes annually

Landfill methane becomes alternative energy source
Project: Suzhou Landfill Gas Energy
Donor: Switzerland, EU
Host country: China
Sector: Energy
CO 2e reductions: 312,000 tonnes
Photo credit: South Pole Carbon Asset Management
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UK plants seed for low-carbon thinking
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France gets serious about green growth
Project: Green Credit Line
Donor: France
Host country: China
Sector: Banking
Investment: 180 million Euros by AFD; 250 million Euros in co-financing
CO 2e reductions: 5 million tonnes in 2010
Press contact: Laure Weisgerber, Communications Division, AFD
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Modernising urban transport in Mexico
Project: Urban Transport Transformation Programme
Donor: Clean Technology Fund of the World Bank
Host country: Mexico
Sector: Transportation
CO 2e reductions: 1.96 million tonnes
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E-mail: aardilagomez@worldbank.org

A bright future for solar energy
Project: Solar water heaters
Donor: Germany
Host country: Mexico
Sector: Solar
Contribution: 3.1 million Euros,
CO2e reductions: 160,000 tonnes
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Pumped up
Project: Alianza
Donor: World Bank / GEF
Host country: Mexico
Sector: Solar
CO 2e reductions: 300,000 tonnes
Investment: US$454.9 million
The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.

Lighting the way to the future
Project: Ilumex
Host country: Mexico
Donor country: Norway, GEF, World Bank (CTF)
Sector: Lighting
CO 2e reductions: 3.9 million tonnes
Investment: US$3 million (2.17 Euros); US $50 million by CTF.
The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.
European Union donor countries contributed half of the total US$6.5 billion in pledges to the Clean Technology Fund in 2008.

India's sugar-cane powered future
Project: Malavalli Power Plant
Donor: myclimate (Switzerland)
Host country: India
Sector: Energy
CO 2e reductions: 18,000 annually
Press contact: Kathrin Dellantonio, myclimate
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Photo credit: myclimate

Letting a little light shine
Press contact: Tanya Petersen, The Gold Standard Foundation
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Photo credit: myclimate

Keeping cool, saving energy
Project: Chiller Energy Efficiency Project
Donors: GEF, Multilateral Fund
Host country: India
Sector: Energy efficiency
Investment: US$7.3 million
CO 2e reductions: 13 million tonnes
The European Union contributes 33 to 40 percent of overall funding to the GEF in each replenishment, which occurs ever four years.

Buying power
Project: Indian Solar Loan Programme
Donor: UNEP, UNEP Risoe Centre (Denmark), UN Foundation, UK
Host country: India
Investment: US$7.6 million, US$1.5 million
Sector: Renewable energy
Press contact: Mark Radka, UNEP's Division of Technology, Industry and Economics
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Influencing the commute
Project: TransJakarta BRT
Donor: GEF
Host country: Indonesia
Sector: Transportation
Investment: US$5.8 million
CO 2e reductions: 200,000 tonnes
Photo credit: ITDP
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Three-wheeled reform
Project: Electric Vehicles
Donor: GEF (33-40 percent EU funding)
Host country: Sri Lanka
Sector: Transportation
Contribution: US $28,946
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Dhatu Senanayake, Lanka Electric Vehicle Association
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Full steam ahead
Project: Olkaria III
Donor: Germany, France, The Netherlands, UK, and EU
Host country: Kenya
Sector: Energy
CO 2e reductions: 1.2M tonnes
Investment by EU : 76.5 million Euros
Photo credit: DEG
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Geothermal energy helps meet increased demand
Project: Geothermal Risk Mitigation Strategy
Donor: Germany
Host country: Uganda, Kenya, Tanzania, Rwanda, Ethiopia
Sector: Renewable Energy
Investment by EU : 20-50 million Euros

Building with straw
Project: Energy-efficient straw-bale housing
Donors: GEF, Norway, Germany, EU
Host: Mongolia
Sector: Building, energy efficiency
Investment: US$7.39 million
CO 2e reductions: n/a

Solar success
Project: PROSOL Solar Water Heater
Host country: Tunisia
Donor country: Italy
Sector: Renewable Energy
Investment: 1.7M million Euros
CO2e reductions: 214,000 tonnes
Photo credit: PROSOL
Press contact: Myriem Touhami, PROSOL manager
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E-mail: myriem.touhami@unep.org

Seeing the light
Project: Rooftop solar photovoltaic systems
Donor: The World Bank
Host country: Bangladesh
Sector: Solar lighting
Investment: US$308 million
CO 2 reductions: 260,000 tonnes
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E-mail: areeves@worldbank.org
In Dhaka: Mehrin Ahmed Mahbub, World Bank
Tel: 880-2-8159001-28 ext. 4251
E-mail: mmahbub@worldbank.org

Firing up change
Project: Turbococina cook stoves
Donor: Switzerland
Host country: El Salvador
Sector: Cookstoves, forestry
CO 2e reductions: 500,000 tonnes
Press contact: Diego Salcedo
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Juan Cardenal
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E-mail: jacardenal@turbococina.org

Constructing change
Project: Qori Q'oncha
Donor: Switzerland, France
Host country: El Salvador
Sector: Forestry
CO2e reductions: 175,000 tonnes
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Photo credit: myclimate

Conserving with cookstoves
Project: SAVE80
Donor: Germany
Host country: Nigeria
Sector: Cookstoves, forestry
Investment: 800,000 Euros
CO 2e reductions: 300,000 tonnes
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E-mail: zerzawy@atmosfair.de
Photo credit: atmosfair

Light it up, grandmother
Project: Basa Magogo
Donor: Denmark, Germany,The Netherlands
Host Country: South Africa
Sector: Health
Contribution: 2 million DKK (269,000 Euros)
CO2e reduction: 400,000 tonnes
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Funding a forest
Project: REDD
Host: Brazil
Donors: Norway, Germany
Sector: Forestry
Investment: US$1 billion from Norway; US$58 million from Germany
CO2e reductions: 4.8 billion tonnes
Press contacts: NORAD, Norwegian Agency for Development Cooperation
Tel: +47 22 24 20 30, Simon Zadek, Senior Fellow, Global Green Growth Institute
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E-mail: simon@zadek.net

On a high wire
Project: Cable Cars Metro Medellín
Donor: AFD / myclimate
Host country: Colombia
Sector: Public transport
Investment: US$250 million
CO 2e reductions: 62,047 tonnes
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Anne-Sophie Morizot, Hopscotch
E-mail: asmorizot@hopscotch.fr
Kathrin Dellantonio, myclimate
E-mail: info@myclimate.org

Lighting Africa
Project: Lighting Africa
Donor: PPIAF and World Bank
Hosts: African countries
Investment: US$6.9 million
Press contact: Bénédicte Walter, Communication Consultant for Lighting Africa / IFC
Tel: +254 20 2759448
E-mail: bwalter@ifc.org

Energized future
Project: Energising Development in Bolivia
Donor: GIZ (Germany and The Netherlands)
Host country: Bolivia
Sector: Energy
Investment: 10 million Euros
CO 2e reductions: n/a
Press contacts: Klas Heising, GIZ
E-mail: klas.heising@giz.de
Verena Brinkmann, GIZ
E-mail: endev@giz.de

Winds of change
Project: Development of wind energy industry
Donor: Germany
Host country: Vietnam
Sector: Renewable energy
Investment: 1 million Euros
Press contact: Angelika Wasielke, GIZ
Tel: 0049 (0) 6196 79-1224
E-mail: angelika.wasielke@giz.de
Photo credit: GIZ

Advice brings change
Project: Nigeria Infrastructure Advisory Facility
Donor: United Kingdom
Host country: Nigeria
Investment: 19.5 million UK pounds
Sector: Energy
Press contact: pressoffice@dfid.gov.uk

Obstacles removed, solar energy flows
Project: NAMREP
Donor: GEF
Host country: Namibia
Sector: Renewable energy
Investment: US$5.2 million
CO 2e reductions: 233,700 tonnes

On the edge
Project: ESAP I and II
Donors: Norway, Denmark, Germany
Host country: Nepal
Sectors: Renewable energy, energy efficiency
Investment: 254 million DKK (DANIDA gave 154 million + 150 million = 304 million DKK); 147.4 million NOK; 8.5 million Euros
Press contact: Vognild Inge Harald, Norway
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High potential
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Photo credit: UNEP

On climate front lines, nation seeks renewables
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