



OUR PLANET

The magazine of the United Nations Environment Programme - December 2008

RENEWABLE ENERGY

Generating power, jobs and development



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Our Planet, the magazine of the United Nations Environment Programme (UNEP)
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To view current and past issues of this publication online, please visit www.unep.org/ourplanet

ISSN 101 - 7394

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Produced by: UNEP Division of Communications and Public Information
Printed by: Phoenix Design Aid
Distributed by: SMI Books

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reflections

by Achim Steiner,
U.N. Under-Secretary-General and
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A chill wind has blown through international stock markets, and renewable energy companies have not been immune. A global index of solar stocks, the Claymore/MAC index, fell by over 50 per cent between April — when it started trading — and early November, while the New Energy Global Innovation Index fell by a huge 45 per cent in October alone.

Some have drawn parallels with the dot.com bubble when Internet start-up companies, based on marketing rather than real markets, came and went like mayflies. But this ignores hard and fast fundamentals that should make renewable energy companies far more robust and lasting.

The main driving force, climate change — unlike the stock markets — has steadily grown, not waxed and waned. Scientists studying ice cores in Antarctica estimate that greenhouse gases are now at their highest concentration for 800,000 years.

Serious long-term government commitments are emerging, partly as a result of the Kyoto Protocol and in anticipation of deeper and more comprehensive deal in Copenhagen in 2009. The European Union wants to generate 20 per cent of its energy from renewable sources by 2020, up from just over 6 per cent in 2005. British Prime Minister Gordon Brown has announced a big expansion of wind power — 7,000 turbines on- and off-shore. The U.S. government recently passed the Production Tax Credit and Investment Tax Credit, extending support for wind power by a year and for geothermal and solar power by two and eight respectively. And in the run-up to the elections, President-elect Obama pledged to invest \$150 billion in clean energy over the next 10 years, generating five million jobs.

Meanwhile Clean Development Mechanism projects, now numbering over three thousand, appear unaffected by the financial crisis: new resources are being found and exploited daily, it seems. Countries like Mali and Madagascar, once outside the mechanism, are now accessing it, partly as a result of UN-linked capacity building. And renewables remain the fastest, most cost-effective and most environmentally friendly solution for many of the two billion people still without access to modern energy.

A recent survey in Ghana — part of UNEP and the Global Environment Facility's Solar and Wind Energy Resource Assessment — has found 100 square kilometres of good windy land able to generate 500 megawatts of electricity or 10 per cent of the country's needs. And a consortium including



a Dutch multinational, the German Wind Energy Institute and local investors are planning a 300 megawatts wind farm in Turkana, northern Kenya. Renewable energy companies are no longer small start-ups. Suntech Power, headquartered in Wuxi, China — the world's biggest solar manufacturer — has a market capitalization of \$3.5 billion; First Solar in the United States has one of \$11.3 billion.

The economic models of the 20th century are now hitting the limits of what is possible — both in terms of our ecological footprint and in delivering better livelihoods for the 2.6 billion people still living on less than \$2 a day. Investments will soon be pouring back into the global economy. Will they go into yesterday's old, extractive, short-term economy or into a new Green Economy that will deal with today's challenges and generate countless economic opportunities for poor and well-off alike? Renewable energy generates three to five times more jobs than fossil fuel generation and its ecological footprint is infinitely smaller.

This edition of *Our Planet* marks the climate convention meeting in Poznan, which must be central to the transition to a low carbon, green energy economy. Strategies for long-term cooperative action on climate change must be fleshed out alongside the financial architecture needed to boost investments in renewables and other sectors. Directing the multi-billion stimulus packages being lined up by governments, allied to a reshaping and refocusing of global markets, can assist success.

However the biggest stimulus package of all — which could set the stage for sustainable growth in the 21st century — must come in Copenhagen next year. If the international community can make this a big deal in every sense of the word, we will be a long way to a Global Green New Deal that will meet the genuine development needs of 6.7 — rising to 9 — billion people.

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Cover photo © ADRIAN WILSON / Beateworks / Corbis. 'New Green Deal' is the phrase on the lips of world leaders on the eve of the December 2008 climate change negotiations in Poznan, Poland. With economies in turmoil around the world, and global warming firmly installed at the top of the international political agenda, the development of renewable and clean energy options looks like a classic 'win-win-win' situation: curbing greenhouse gas emissions, addressing growing concern over energy security, and providing new employment opportunities for millions. This issue of *Our Planet* explains how.





generating growth

by Matthias Machnig

When senior German executives were asked by a major economics newspaper to name the business with the greatest future potential, three quarters cited renewable energy. In the past two years, for example, 15 new solar module factories have gone into operation or been under construction in Germany — representing an investment of around 1 billion Euros. Meanwhile, at the new Alpha Ventus test site in the North Sea, German manufacturers are developing technologies to advance offshore wind energy use and are demonstrating the suitability of large-scale 5 megawatt wind turbines, which can also make important future contributions onshore.

All these are signs of the flourishing, innovation-friendly and dynamically growing renewable energy technology sector. It owes its current standing to a far-sighted energy policy which, in view of globally rising demand, is the best insurance against limited resources, climate threats and supply shortages.

Good renewable energy policy is characterised by reliability, consistency, flexibility, credibility and transparency — criteria the German Government is committed to meeting. As early as 1991 — 17 years ago — the Electricity Feed Act was established as one of the first systematic support instruments for renewable electricity. In 2000, the Renewable Energy Sources Act (EEG) followed; it distinguishes between the different sources and was recently evaluated and improved.

The EEG started a rapid development of renewable electricity generation, particularly from wind, solar and biomass energy sources. Within just 10 years its share of gross electricity consumption has almost tripled from around 5 to over 14 per cent. We have thus already far exceeded the 12.5 per cent target set by the European Commission for Germany for 2010.

Renewable energies have long ceased to be a niche product and are now a mainstay of the electricity industry. They also play a substantial role in other sectors, satisfying 6.6 per cent of our demand for heat and 7.6 per cent of our demand for fuel. We must continue on this successful course, for our goal is extremely ambitious. We aim to generate at least 30 per cent of our electricity from renewable sources in 2020, and to continue this growth: after 2030, they should account for more than half Germany's electricity supply.

This growth has a positive effect in combating climate change. In 2007, renewables in Germany saved over 115 million tonnes of CO₂ emissions from electricity generation, heat supply and transport. The EEG itself contributed savings of 57 million tonnes. This equals more than 7 per cent of Germany's emissions and amounts to 13 million tonnes more than in the previous year. We will increase this figure. In 2020 the EEG alone will save over 100 million tonnes of CO₂ emissions. The feed-in system for electricity from renewable energies is the only German policy instrument that can bring about such huge reductions in climate-damaging emissions. It is irreplaceable if we are to achieve a 40 per cent reduction in our total greenhouse gas emissions by 2020 over 1990 levels.

The EEG's recipe for success has four ingredients: guaranteed connection of all renewable energy installations to the electricity grid; priority purchase and distribution of the electricity they generate; fixed feed-in tariffs for the different types of renewables, generally laid down for 20 years; and, not least, the long-term, clear and reliable target for renewable energies' share of electricity consumption — which we have just raised from at least 20 to at least 30 per cent by 2020. Installers and manufacturers of renewable energy technologies confirm that the planning and investment security created by the EEG plays a major part in its success. Fixed feed-in tariffs carry a low risk, giving them an advantage over quota provisions combined with tradable certificates. This creates the conditions which enable investors to build new factories and power plants, for installation manufacturers to conduct intensive research and development and for banks to offer low-interest credits.

The European Commission confirmed this again in January 2008 when, comparing support instruments for renewable energies, it concluded that well-adapted feed-in regimes — like the EEG — are generally the most efficient and effective of them. So it is no wonder that Germany exports the EEG as well as wind turbines and solar modules: around 50 countries worldwide now have a similar system of feed-in tariffs.


Importantly, the Act was not intended to be a static set of provisions, but was aimed at encouraging innovations through sophisticated mechanisms to drive renewables rapidly up the economic learning curve. Degression rates, bonuses for especially innovative technologies and a regular review of the Act ensure its present and future effectiveness.

Innovation also means thinking about how we can best integrate renewable sources' rapidly growing share into the electricity system. We have fine tuned the feed-in management system that comes into play when there are bottlenecks in the grid. We are also developing different incentives to ensure that renewable energies not only provide electrical energy but can also take on other functions, such as voltage and frequency control and reactive power compensation or involvement in the balancing energy market. Storage, load management and the precise optimisation of the electricity grid infrastructure are also important. Progress in information and communication technologies now allows us to interconnect many decentralised generators and loads in a 'virtual combination power plant' whose technical properties are equal to a conventional large-scale power plant. We will intensify our support for this development to ensure that, in the long-term, modern renewable energy sources become the majority share of electricity supply.

Currently, the higher costs for renewable energies are paid by electricity consumers. In 2007 the additional purchase costs amounted to 4.3 billion euro — which, for an average German household, means additional costs of around 3 Euros per month. Even though these costs are set to rise moderately over the next couple of years during the continued expansion, renewable energies will be more cost-effective than conventional energy sources in around 10 years time. Then Germany will reap the rewards of its groundwork and benefit from annually increasing savings.

Our domestic economy is already profiting. The Euros invested reduce import dependency; renewable electricity gives us protection from fossil fuel prices which will continue to rise; and eco-power plants curb electricity prices on the stock exchange. We are, moreover, creating a favourable climate for a sector which had a total turnover of nearly 25 billion Euros in 2007, securing around 250,000 jobs — particularly in regions of eastern Germany most affected by structural change.

In a nutshell: climate protection is the most intelligent form of economic policy. It initially costs money, but ultimately leads to a genuine 'vorsprung durch technik' (head start through technology). The export market is gaining in importance, as many countries adopt ambitious expansion targets for renewable energies; the German wind sector's export quota now stands at 70 per cent. Although investments in new wind turbines in Germany have fallen, the companies which operate internationally have seen an increase in turnover thanks to the "first mover advantage".

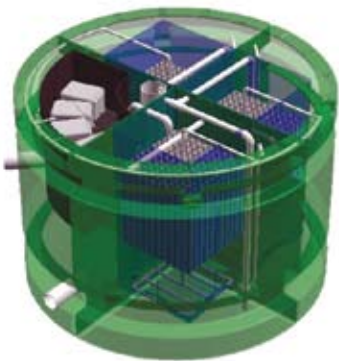
The EEG can only be one component of our policy for the future. The Integrated Energy and Climate Programme, which we have developed in recent months and which, to a large extent, has already been legally implemented, comprises 29 measures: the new EEG; support programmes for heat from renewable energies; underground cabling to accelerate grid expansion and more stringent insulation standards in buildings being just a few. We will strengthen electricity generation from climate-friendly combined heat and power plants and double our energy productivity by 2020, clearly showing that we are focusing on energy efficiency alongside renewables. With these two closely interlinked strategic elements we will continue along our chosen path to protect the climate. 

products

Water wise

In these days of droughts and global warming, it is ever more crucial to stop needlessly wasting water. One solution is the Venus, a septic system that takes your household water — including sewage — and cleans it up so that it can be used for yard irrigation. This makes the Venus — designed by Danish company Biokube — much more efficient than ordinary tanks, which settle solids out via sheer gravity. The Venus puts the water through several membranes housing bacteria, making it clean enough to go straight into your soil.

www.biokube.co.uk



Ethical fashion



The Re: Fashion Awards are the world's first ethical fashion awards. Presented in London on 13 November, the twelve awards "celebrate social and environmental improvements in retail, manufacture and consumer engagement." Categories include Retailer of the Year, the Cotton Award and the Africa Award.

In a sign that sustainable fashion is no longer the domain of hemp-wearing radicals, the glitzy event brought together scenesters like Pixie Geldof and Oswald Boateng and featured fashion by leading designers, including Vivienne Westwood.



The Environment Award went to Veja — a French company that produces sneakers through small producers in Brazil — for its pioneering work replacing traditional cotton by organic cotton, supporting wild latex production in Amazonia to fight



against deforestation, and using ecological leather instead of chrome tanned leather.

Pachacuti, won both the Business Award and the People Award. A Fairtrade fashion company, it produces a range of goods from alpaca knitwear to Panama hats that aims to improve the lives of Andean producers.

And the Cotton Awards went to Pants to Poverty, an organization that sells organic underwear through



ethical and independent shops to raise money for the Make Poverty History campaign.

www.refashionawards.org

Electric scooter



No fumes, no noise, no emissions and no visits to the gas station — the Chinese-built Ego Street Scoota is a 100 per cent electric scooter that can be charged using the mains electricity supply. The bike has a 30-to 40-mile range and a top speed of 30 mph — not bad considering it only costs around eight pence for an eight-hour charge. Could this be the answer to high fuel prices, congestion and, ultimately, global warming?

<http://www.firebox.com/product/2166/Ego-Electric-Street-Scoota>

Helping refugees

The Gaia Association won an Ashden Award earlier this year for its work providing ethanol-fuelled stoves to around 1,800 families in eastern Ethiopia's Kebribeyah refugee camp. Some 17,000 people live in the camp, having fled conflict in neighbouring Somalia — and they rely on fuelwood for cooking. The Gaia Association's project is helping to prevent the indiscriminate wood use which has contributed to extensive deforestation in the area, as well as greatly improving the refugees' living conditions. The ethanol is produced from locally-available molasses, a sugar by-product which previously caused pollution.

www.gvepinternational.org



Solar concentrator



We could soon collect solar energy through our windows. Researchers at the Massachusetts Institute of Technology have developed a light-absorbing dye that, when painted on a window, transfers energy via the glass into solar cells at the window's edges. The scientists found a 30 per cent higher performance with the combined system of light-absorbing dye and solar panels compared to a stand-alone solar cell. Ultimately, they think this approach will allow us to nearly double the performance of existing solar cells for minimal added cost. The 'solar concentrator' could be marketed within three years.

<http://www.guardian.co.uk/environment/2008/jul/10/solarpower.renewableenergy>

Solar-powered radio

The world's first solar-powered digital radio, launched by British company Roberts, capitalizes on solar energy while avoiding the environmental scourge of batteries — no mean feat given that the U.K., for example, consumes around 30,000 tonnes of portable batteries every year. The radio provides up to 27 hours of listening away from sunlight.

<http://www.biggreensmile.com/products/roberts-solar-powered-dab-radio/rbsoldab.aspx?productid=rbsoldab>



mission

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