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Our Planet

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ENERGY, FINANCE AND CLIMATE CHANGE

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PO Box 30552 Nairobi, Kenya
Tel: (254 20)621 234

Fax: (254 20)623 927
e-mail: unepub@unep.org
www.unep.org

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Director of Publication: Eric Falt
Editor: Geoffrey Lean
Coordinators: Naomi Poulton, Elisabeth Waechter
Special Contributor: Nick Nuttall
Circulation Manager: Manyahlesha Kebede
Design: Sharon Chemai
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From the desk of

KLAUS TOEPFER

United Nations
Under-Secretary-
General and
Executive Director,
UNEP

enough and there are barriers, not least financial ones, preventing it realising its true potential. We also need greater investment and more imaginative economic instruments to deliver greater energy efficiency.

This issue of *Our Planet* comes out in time for the 11th session of the Conference of the Parties to the Climate Change Convention and its Kyoto Protocol in Montreal, Canada. The growing activity over cleaner energy is in no small part due to the Protocol's anticipated, and then final entry, into force – setting emission reduction targets and time tables up to 2012. I would like to pay tribute here to Joke Waller-Hunter, the Framework Convention's executive secretary who sadly passed away in October.

Emerging economies

Besides the Kyoto process, considerable activity is taking place in rapidly emerging economies, like China, and new initiatives are being spearheaded by the G8 and the United States emphasising technology transfer to developing countries. These activities cannot be a substitute for the Protocol, but they can complement it and may – if carefully scripted – help take us beyond 2012 towards the even deeper cuts needed to stabilise the atmosphere.

Let us hope that the investment community supports all these efforts. For as the Finance Initiative report makes clear, investment that takes account of environmental, social and governmental issues both makes economic sense and meets the wider and deeper goals so many of us espouse ■

There has been considerable debate over whether institutional investors in areas like pension funds have a legal duty to factor environmental, social and governance issues into their investment decisions. Some argue that these issues affect the performance of investments and thus the portfolios they manage. Yet many institutional investors continue to take the traditional view – that such issues are marginal, even irrelevant and that their legal responsibility is simply to maximise profits along more narrow lines.

Investment decision

A new legal appraisal, aimed at resolving this dilemma, would seem to steer the debate towards the first camp and has wide-ranging implications for the way the world operates, not least over energy and climate change. The study – compiled by Paul Watchman, a partner at the UK-based law firm Freshfields, Bruckhaus Deringer, on behalf of the UNEP Finance Initiative – concludes that institutional investors do have a legal responsibility to consider wider issues in their investment decision. "Indeed", it adds, "a failure to have regard to such considerations will often be a breach of the legal duties applicable to institutional investors."

It also concludes that, legally, investors must take into account the views of those who ultimately benefit from their activities and that those views are evolving to reflect society's interests in environment,

social and governance matters. This has potentially profound implications on issues ranging from child labour to climate change.

Energy can also be a moral issue. The poor need it to pull them out of deprivation, but they also need it in more efficient and indigenous forms. Every time the oil price bounces over the \$50 a barrel mark, poor countries are forced to spend extra money that could be devoted to education or healthcare.

Golden opportunity

Over the next three decades an estimated \$16 trillion is likely to be invested in the energy sector to maintain, replace and expand infrastructure – about 60 per cent of it for electricity. This is a golden opportunity to deliver a less carbon intensive and more energy efficient world. The investment decisions of banks, pension funds, asset managers and others, whose portfolios represent trillions of dollars, will be critical in determining the energy mix.

Solar cells

Renewable energy, like photovoltaics and wind, have become increasingly competitive. Electricity generated from solar cells, for example, has tumbled from 100 cents per kilowatt/hour in 1980 to around 15 today. Meanwhile, the annual investment in renewables has risen sharply, from about \$6 billion in 1995 to over \$16 billion now. But it is clearly not

YOUR VIEWS

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*Feedback, **Our Planet**
Division of Communications and
Public Information, UNEP
PO Box 30552, Nairobi
KENYA*

Wake Up *Calls*

PRINCE EL HASSAN BIN TALAL calls for immediate action to tackle the world's escalating climate and environmental crises

Our environment is as temperamental and variable as we are – but its wrath speaks louder than the deafening silence with which we address its complaints about how we use and abuse it.

Extreme conditions cry out for extreme measures. The utter devastation inflicted by hurricane Katrina in the USA, and the recent storms and severe floods in Europe, serve as wake up calls for us all to rise to rescue both humankind and the environment.

Just think about the mutual relationship between earth and the sun. The sun emits light energy to heat the earth, which emits back infrared radiation by the natural greenhouse effect. This has made our planet some 30°C warmer than it would otherwise be, essential for life as we know it. The level of natural greenhouse gases that achieve this effect in the atmosphere is less than one per cent: generating more of them, together with increasing other industrial emissions, will disrupt our environment.

Extremely hazardous

Germs and bacteria cannot be seen with the naked eye but this does not nullify their existence: they manifest themselves in the form of disease. The same holds true for the malevolent gases which are causing changes in the global climate that may be extremely hazardous for mankind. Burning coal, oil and natural gas generates carbon dioxide (CO₂); agriculture and changes in land use emit methane and nitrous oxide; vehicular exhaust fumes and industrial gases linger in the air; all work collectively to disturb the intricate balance of the interchange between our planet and the sun.

The somewhat brighter side of the story is that oil-fired power stations, smoke from deforestation, and the burning of organic material produce aerosols that reflect sunlight back into space, thereby cooling the earth and countering the greenhouse effect to a certain extent. The aerosols, however, are relatively short-lived compared to the greenhouse gases (GHGs), making their cooling effect insufficient in the long term. They can also cause acid rain and poor air quality.

Many latent climatic changes are taking place, manifesting themselves in the aberrations and irregularities that we see in the rising oceans, the changes in cloud cover and the intensity of thunderstorms and hurricanes.



Peter Schickert/Still Pictures

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In system dynamics, feedback can be positive (damping change) or negative (reinforcing it). Positive feedback loopholes have been identified within the climate change system. Triggered by GHG emissions, they accelerate the global warming effect and threaten to spiral out of control. Negative feedback, on the other hand, helps to slow down and control climate change.

Optimal conditions

Climate change is characterised by increasing sea and air temperatures, which cause a decrease of CO₂ absorption. Surface waters are becoming more acid, reducing optimal conditions for planktonic life and thus plankton absorption of CO₂. The warming also generates high levels of atmospheric water vapour, itself a powerful GHG.

A warming of as much as two degrees could produce ocean level increases of two feet by the year 2050. One billion people – 17 per cent of the world's population – live on land likely to be dramatically changed by the rising waters, with low-lying countries hardest hit. The potential refugee problem will worsen the global situation.

Recent studies suggest that there is a critical point at which positive feedback loops become dominant and render further increases in temperature independent of any reduction ►

in human generated greenhouse gases. Even if we drastically reduce GHG emissions today our planet will continue to heat for decades.

Already 40-50 per cent of the world's population are undernourished and there are 50 million starvation-related deaths each year: 14.6 million of the casualties are children. Meanwhile, 1.5 billion people do not have safe drinking water and twice as many lack basic sanitation.

Factor in the world's ever increasing population (now at 6.25 billion and expected to increase by over 12 per cent over the next 12 years), the rush to modernisation of the developing countries (which account for 98 per cent of the annual population growth) and the increasing energy they will use, and the concept of environmental catastrophe becomes inevitable.

Enormous stress

Forty per cent of our remaining forests will disappear by the year 2050, and with them, the quality of the air we breathe. Deforestation, overgrazing and poor farming practices result in soil erosion. When only 60.5 per cent of the world's land mass is suitable for agriculture and topsoil cannot be replenished, this translates to worldwide famine in 40 years.

Enormous stress is being put on the Earth's recuperative powers to sustain the world's growing population. Twenty mega cities already have hazardous air quality. Heavy metal levels exceed safe parameters in most cities' drinking water. Over 70 per cent of the 73,000 chemicals now in use have never been tested for their effects on the environment and living organisms – and many, like components of pesticides, are both dangerous and found throughout our food chain.

The condition of the oceans is equally miserable, with oil spills and other contaminants threatening aquatic resources and the major supplies of food they provide. Current garbage disposal methods pose further problems as burning pollutes the atmosphere, landfills contaminate aquifers, and ocean dumping destroys the aquatic environment.

Serious and extensive effort better to understand, analyse and tackle our environmental challenges and their underlying causes has blossomed in many invaluable initiatives and reports – including, to mention but a few: the “Planetary Contract” of the Global Marshall Plan by Dr. Radermacher; the Meadows Report presented to the Club of Rome on the “Limits to Growth”; the Trans-Mediterranean Renewable Energy Corporation (TREC); and the proposal for “A Community of Energy, Water and Environment” for the Middle East, North Africa and the European Union, discussed in Prague in October.

Fossil fuel

Scientists, policy-makers and industry must continue to toil together to address this formidable multitude of issues, and to try to find alternative forms of clean, sustainable, affordable and tradable energy. Saving fossil fuel is a lot cheaper than burning it for the environment and, in the long run, for us too. Research is ongoing, and endless proposals to produce hydrogen, wind, solar, photovoltaic and bio- energy are being drafted and tested as we continue with our carbon-rich lifestyle.

Forty per cent of our remaining forests will disappear by the year 2050, and with them, the quality of the air we breathe. Deforestation, overgrazing and poor farming practices result in soil erosion

As consumers, we can set the requirements, the demand and policy for maintaining life on our planet for the coming generations, by altering our routines of acquisition and consumption and by opting for less now in order to have more in the future. We must adopt a strongly negative carbon culture, and improve end-use efficiency as the fastest and most lucrative way to save energy. Science is a Godsend because it can not only predict disasters, but contain them.

In “The Meridian Report” of July 2005 David Wasdell, director of the Meridian Programme, wrote:

“We cannot afford any further delay in effective action. Any procrastination increasingly risks global bankruptcy in financing the needed intervention, and massive human suffering in carrying it through to completion. It also threatens our ability to regain control before the system is overwhelmed by the positive feedback loops and drifts inexorably into runaway global warming. To allow the collusional vested interests of the social, economic and political systems to continue to hijack the world and hold it to ransom for the sake of short term profit and national protectionism, would be an act of collective suicide. I do not wish to believe that humanity is that mad.”

Let's act now before we become nomads following a mirage in search of an oasis in the middle of a desert ■

HRH Prince El Hassan bin Talal of the Hashemite Kingdom of Jordan is founder and director of the Hashemite Aid and Relief Agency, Centre for Educational Development, and the Institute of Diplomacy, and President of the Club of Rome.



Roger Le Moine/Topfoto

Shared Responsibility

CHUCK HAGEL outlines principles on which the United States and other countries can agree to combat climate change



Antonino Macias Martinez/UNEP/Sail Pictures

The question we face is not whether we should take action on climate change, but what kind of action we should take. Climate change is a shared responsibility for all nations, including the United States: it does not recognise national borders. Global climate policy affects the world's economic, energy, and environmental policies – and dealing with it requires a commitment of diplomatic leadership and coordination worthy of the magnitude of the challenge.

Earlier this year I introduced legislation with Senators Pryor, Alexander, Landrieu, Craig, Dole, Murkowski, Voinovich and Stevens, which I believe can help contribute to a new American and international approach to climate change. The legislation, which passed into law in July as part of the Energy Policy Act of 2005, emphasizes the linkages between global environmental, economic, and energy interests – and the priority of working closely with developing countries on them. The challenges of a clean

environment cannot be separated from the imperatives of growing economies, or from the challenges of global poverty and underdevelopment. Our approach built upon three principles, which I outlined at a speech at the United Nations earlier this year.

Energy technology

First, a workable global climate policy should include shared responsibilities and common standards by developed and developing nations in reducing greenhouse gas emissions. Developing countries are becoming the major emitters of these gases, but they are exempted from the Kyoto Protocol. Within the next 20 years, they are projected to account for two thirds of the growth in carbon dioxide emissions, as their populations and economies expand. Any reduction in greenhouse gas emissions by the United States and other developed countries will be eclipsed by those from developing

nations, such as China, which will soon be the world's largest emitter of man-made greenhouse gases.

I understand that developing nations cannot achieve greenhouse gas reductions until they obtain higher standards of living for their people. They lack clean energy technology and they cannot absorb the economic impact of the changes necessary for emissions reductions. Any future policy initiatives must recognize their limitations in meeting these objectives, and the necessity of including them in any successful future initiative.

Environmental initiative

It is in the interests of the United States and industrialized nations to help developing countries by sharing cleaner energy and environmental technology. They can then “leap-frog” over the highly polluting stages of development that countries like the U.S. have already been through.

Second, and related, global climate policy – like any environmental initiative – cannot be considered in isolation of economic and energy interests. Too often, environmental policy has been considered in a kind of vacuum, without sober analysis or appreciation of the economic implications of environmental objectives. Climate policies must combine action on the environment with the need for increased energy resources to fuel economic growth and development and to reduce poverty in developing countries. That was the message from developing countries at the 2002 World Summit on Sustainable Development in Johannesburg. It will require a market-driven, technology-based approach that complements the world's environmental interests, and connects the public and private sectors.

Global climate change must be considered in the wider context of the challenge of economic underdevelopment and worldwide poverty. Five billion of the world's six billion people live in less developed countries. Half live on less than \$2 per day. One billion lack access to clean water sources, and more than 2.5 billion do not have proper sanitation. Forty million people are infected with HIV or living with AIDS – the leading cause of death in sub-Saharan Africa. There will be 8 billion people by the year 2025 and most of the world's population ►

growth will be in developing countries, where nearly one-in-three is under the age of 15.

Many developing world governments will not be able to meet the basic demands of their populations for jobs, health care and security. The strains of demography, frustrated economic development and authoritarian governments contribute to radicalised populations and politics. Part of the solution depends upon sound economic growth strategies. Global climate policies cannot be considered in isolation of the challenges of poverty and underdevelopment.

Climate policy

We are most successful in confronting the most difficult issues when we draw on the strength of the private sector. There is a role for diplomacy in global climate policy, but technological innovation will come from the private sector, and from public-private partnerships, which meld the institutional leverage of governments with the innovation of industry. Creating incentives for private sector participation and technological innovation will be critical to real progress on global climate policy.

Such policy must give priority to the development of alternative clean energy sources and renewable fuels. Advances in energy efficiency are directly connected to economic and environmental policies. The acceleration of alternative clean energy sources and renewable fuels will depend on technological innovations by private industry – another reason for incentives for public-private partnerships in our climate policy.

Economic output

I believe that greenhouse gas intensity – the amount of carbon emitted relative to economic output – is the best measurement for dealing with climate change now. It measures how efficiently a nation uses carbon emitting fuels and technology in producing goods and services, and captures the links between energy efficiency, economic development and the environment. For developing countries, improvements in greenhouse gas intensity can help improve an economy's efficiency and competitiveness. It can, and should, be the baseline measure for greenhouse gas

emission reductions for both developed and developing countries.

There is great promise for these clean fuel additives and renewable fuels in the United States, and around the world. We should work together to accelerate the development of corn and soy products, such as ethanol and bio-diesel, as renewable fuel sources – and of wind, hydrogen and nuclear power. Last year I toured the research and technical centres of three major automobile manufacturers in Detroit, and was particularly interested



Mark Edwards/UNEP/Still Pictures

in the progress of advanced technology vehicles using fuel cells and clean diesel technology, and hybrids. These technologies have the potential to transform our transportation sector while supporting a proactive global climate policy.

Growing interest

Geologic storage – involving pumping carbon dioxide into the ground, rather than dumping it into the atmosphere – offers another example of the role that private industry and technological innovation can play in climate policy. BP has been using it in Algeria's Sahara Desert, Statoil has been working on it in Norway's North Sea, and Chevron Texaco is planning a project off the coast of Australia. An article in the Wall Street Journal early this year reported that, "the concept is drawing growing interest because it could curb global warming more quickly than switching to alternative energy sources or cutting energy use." There is still much

work to be done, but this is the kind of technology that must be employed around the world to achieve meaningful results in reducing greenhouse gas emissions.

Global consensus

The science upon which we base our climate policy must reflect realistic measurements and achievable research objectives. The scientific community is not uniform in its assessments of the causes of climate change. There will

always be uncertainties and incomplete information.

A fresh injection of political will is needed to achieve a global consensus on climate change. The United States must be part of that consensus. Achieving reductions in man-made greenhouse gas emissions is one of the important challenges of our time. As a signatory to the UN Climate Change Convention, America must remain engaged in international initiatives to reduce manmade greenhouse gas emissions. America has an opportunity and a responsibility for global climate policy leadership, and – by harnessing our many strengths – we can help shape a worthy future for all people, and build a better world ■

Chuck Hagel, the senior US Senator from Nebraska, is Chairman of the Senate Foreign Relations International Economic Policy, Export and Trade Promotion Subcommittee and of the Senate Banking Securities and Investment Subcommittee.

Imagination Breakthrough

JEFFREY R. IMMELT calls for a new green technology revolution and describes why it makes sense for business to lead it

It is disappointing that our nation, the United States—which has always seized new opportunities, created new markets and developed new technologies—is failing to push the envelope on cleaner power and environmental technology. Disappointing, too, is our failure to develop a coherent energy policy, which has meant that, nationally, we have not realized our full potential.

It is time for the private sector to assume its rightful place as a major catalyst for environmental change. For far too long people in it have viewed protecting the environment as a no-win business. We believe that the growing market for environmental technology can get us where we need to be.

But industry cannot get there alone. We need to work in concert with the government and environmental groups to promote and reward leadership. We believe that the government can provide leadership by clarifying policy, committing to “market mechanisms,” and promoting diverse energy sources.

Lasting value

This starts with clarity and certainty in energy and environmental policy. Even with the technology at hand, breakthroughs of truly lasting value will only come if government, industry and advocates create certainty on the way forward and commit the intellectual and financial capital needed to find solutions.

There is no time to wait – because tomorrow is now. We are living in a carbon-constrained world where the amount of carbon dioxide we emit must be reduced. We can address that reality head-on, driven by innovation, or by getting pulled into it



decades at a time. We have seen successful technology evolve and we believe firmly in its future. Nuclear is emissions-free. It strengthens our resource diversity and – by strengthening our energy security – bolsters our national security.

By combining the innovative spirit of its entrepreneurs with a focused and forward-looking policy approach, America can lead in the energy sector. We are optimistic about America’s ability to emerge ahead of the pack. But we must act now.

Scarce resources

GE is making a new commitment to our customers around the world to define the cutting edge in cleaner power and environmental technology. We have taken a long look around and this is what we see: diminishing domestic oil and natural gas reserves...our continued dependence on foreign sources of energy...increasingly scarce resources like water in an ever more

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