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Our planet

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THE FUTURE IS PRICELESS

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* All dollar ($) amounts refer to US dollars.

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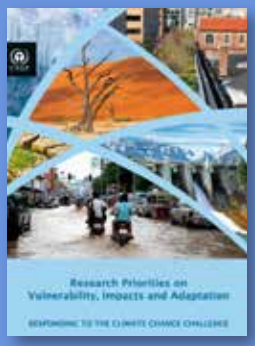
Lead in enamel decorative paints national paint testing results: a nine country study

This report adds to growing knowledge of the extent of the problem of lead in paint in the developing world. Data have now been collected from more than 35 countries.

Building inclusive Green Economies: Success stories From South-South Cooperation

This report highlights how the partnerships between countries in the South are contributing to a global paradigm shift. It provides a snapshot of a myriad of projects and activities that are sparking new concepts, financing, technology, standards and momentum for change.

The report shows how countries and other actors are pursuing initiatives to green key sectors of the economy from agriculture and energy to manufacturing and waste while sharing their knowledge and experiences with others, so they can also reap the benefits as well.

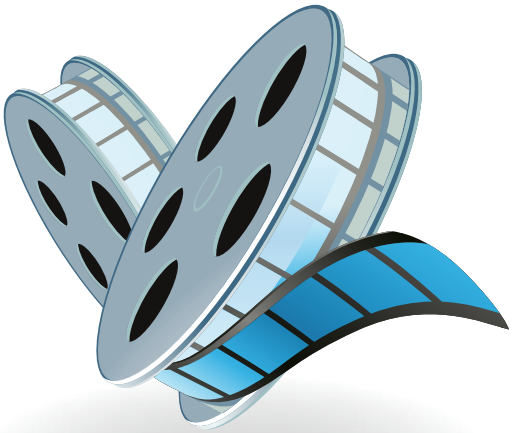


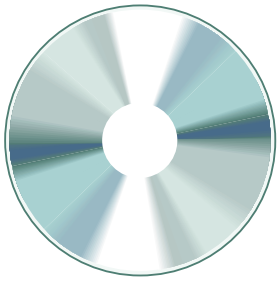
Research Priorities on Vulnerability, Impacts and Adaptation Responding to the climate change challenge

To respond to the demand for better coordination of research, PROVIA has led the development of a set of Research Priorities on vulnerability, impacts and adaptation in consultation with both experts and policymakers. The Research Priorities include new and emerging topics, the importance of which is now coming into focus, and topics that have long been recognized as important but for which research is still required. The Priorities reflect the balance between research supply from experts and research demand from policymakers.

Africa environment outlook 3: Our environment, our health

The Third Africa Environment Outlook (AEO-3), analyses the importance of, and interlinkages between, health and environment and the opportunities and synergies that might be derived from intensified collaboration between the two sectors. It uses the Drivers, Pressures, State, Exposure, Effects and Actions (DPSEEA) analytical framework to undertake an integrated analysis of the state and trends covering the themes of air quality, biodiversity, chemicals and waste,climate change and variability, coastal and marine resources, freshwater and sanitation as well as land. It also illustrates how socio-economic driving forces can generate environmental pressures, leading to altered ecosystem states, personal exposure to risks and adverse health effects.





The Antarctic Ozone Hole - From Discovery to Recovery. Trailer

While the ozone hole has been considered by some as a solved problem, in fact its recovery is still many decades away and the effects and interactions of ozone depletion on climate change are just starting to be understood.

The Antarctic Ozone Hole - Full length Video

While the ozone hole has been considered by some as a solved problem, in fact its recovery is still many decades away and the effects and interactions of ozone depletion on climate change are just starting to be understood.

Japan Tsunami Cleanup

A year after the massive earthquake and tsunami that struck Japan in March 2011, killing just over 19,000 people, a group of international experts in post-disaster waste management were invited to Japan by the government for an information-exchange mission with local authorities.

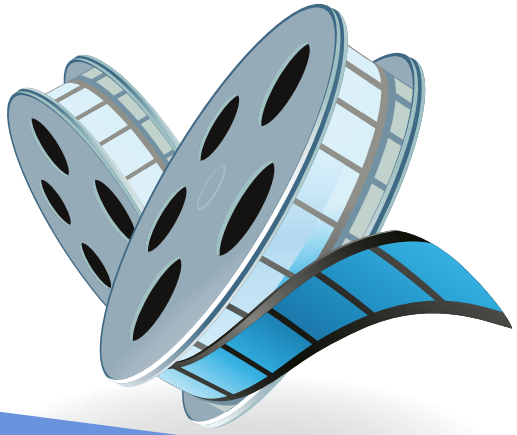
Future Failure

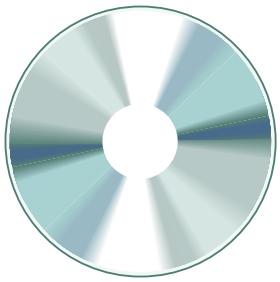
TVE biomovies is a film competition - in its second year - open to anyone aged from 9 to 99 around the world with access to a camera. You could receive US$300 to produce a one-minute film about the environment. Which bit of the environment? Choose a category and decide. Your film can be funny or serious, an animation, a drama or a documentary.

UNEP Bridging Gaps. Are you? Mind The Gap

This mini-series based on UNEP Bridging the Gap report, shows that solutions to keep average global temperature rise to below 2°C are available and being implemented in many different settings, helping countries to adapt to changing climates, move towards lower emission development pathways and often also boosting economies and alleviating poverty.

MULTIMEDIA





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LEAD PHASE OUT

UNEP 40th Anniversary - Lead phase out

Why Celebrate UNEP at 40 – it helped phase out lead in petrol in Africa saving babies and infants from brain damage that globally was costing the world $2.4 trillion a year.

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Forests - We all depend on them

Forests provide employment for up to 1 billion people and contribute over US$ 450 billion to the global economy. Yet in some regions, deforestation continues at an alarming rate. Produced by UNEP to mark the International Day of Forests, this film highlights the critical role of forests in supporting the environment, the economy, and human well-being.

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Promoting Cleaner Fuels and Vehicles for Better Air Quality

The Partnership for Clean Fuels and Vehicles supports developing countries in their efforts to improve fuel and vehicle technologies that reduce air pollution. The partnership builds on current trends and efforts in the development of fuel and vehicle technologies.

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Biogas

This project has contributed to UNEP's intervention on Harmful Substances and Hazardous Waste by ensuring that harmful chemicals and hazardous wastes are managed in a more environmentally sound manner, through better technology and best practices. It has also contributed to the implementation of a resource efficiency project.

Reflections

Achim Steiner
UN Under-Secretary-General and
UN Environment Programme (UNEP)
Executive Director.

2013 has been a crucial year for international aspirations towards keeping a global temperature rise under 2 degrees C this century. For the first time in 800,000 years, concentrations of greenhouse gases in the atmosphere reached 400 parts per million. And the Intergovernmental Panel on Climate Change (IPCC), jointly hosted by UNEP and the World Meteorological Organization issued its Working Group 1 report from its Fifth Assessment Report.

The report underlined increasing scientific certainty that humanity is changing the climate while starkly pointing out that collectively we are half way to spending a carbon budget that cannot be exceeded. Seven billion people, rising to over nine billion by 2050 are on track for a 3 degree C, 4 degree C or more world with all the consequences and risks that entails.

But 2013 also spotlighted remarkable action, fuelled in part by the legacy of the existing UN climate agreements. UNEP - and its partners Bloomberg New Energy Finance and the Frankfurt School of Finance and Management—reported that between 2011 and 2012 115GW of new renewable energy was installed world-wide. Many more developing countries are investing: besides China, countries like Kenya, Morocco, Chile and South Africa are greening their energy mix. Close to 140 nations now have renewable energy targets and new ones are coming on board. Mongolia, the host of this year's World Environment Day, has commissioned its first wind farm and has plans to develop an Asian clean energy super grid with such partners as Japan.

Indeed renewable energy has consistently performed well beyond even the most optimistic estimates. In the year 2000, for example, the International Energy Agency estimated that 34 GW of wind would have been installed by 2010, while the World Bank estimated that China would have 9GW of wind and half a GW of solar by 2020.

In reality, 200 GW of wind was operating world-wide in 2020 and China already had 62GW of wind and 3 GW of solar by 2011, according to Clean Energy Voyage, a UNEP publication for the UN climate convention conference in Warsaw, Poland. Close to six million people are now working in this sector and there will be many more of these decent, skilled jobs if clean energy investments are further accelerated and scaled-up.

Meanwhile, the 2013 Emissions Gap report - coordinated by UNEP and aimed at assessing the gap between current emissions and trajectories, and the need to get these down to around 44GT of CO2 equivalent by 2020—spotlights emissions from agriculture. It estimates the potential to reduce them at around 1 to 4 Gt/yr equivalent CO2. And the steps to achieve this – such as moving to non-tillage farming, improving nutrient and water management in rice fields -- will in many cases boost yields, reduce the costs of inputs to agriculture like fertilizer and help reduce rural poverty.

Besides, a wide range of countries - including the United States and China - are now pledging to cut emissions of HFCs, replacements for ozone layer damaging chemicals which could, if allowed to widely penetrate the market, produce greenhouse gas emissions by 2050 that equal all those from today's transportation.

All this groundswell of action, much it at national level, could go a long way towards bridging the emissions gap by 2020 while setting the stage for the even deeper cuts needed beyond then. But it is unlikely to be enough: international cooperation will also be essential - one reason why a universal and meaningful new climate agreement among all nations has been promised by governments and is urgently needed by 2015.

Warsaw must make some strong and serious moves that begin to flesh out more clearly how this global agreement will look, how it will be financed and how questions such as loss and damage for vulnerable developing nations will be handled. And it needs to spell out how ambition will be raised over the coming seven years before the new agreement kicks in.

The pathways towards cost effective emission reductions are growing and expanding for all nations. Warsaw needs to open the door to a low carbon, resource efficient future starting now and accelerating with agreement in two years time.

Opening a new chapter

MARCIN KOROLEC
Minister of Environment, Poland and President of COP 19

The world urgently needs a new agreement on greenhouse gas emissions reductions. I don't believe that any of the participants in the COP19 climate summit – hosted in Warsaw by Poland – has any doubts about that. Our focus is to set the stage for a full and productive discussion. We must develop a global consensus which propels us towards concluding a new climate agreement in Paris in 2015.

This will be the 19th time that countries meet to discuss one of the most important challenges of the contemporary world: climate change. This year's meeting is particularly significant because it will open a new chapter in our talks. We will start a discussion about an agreement which, for the first time in history, will see 194 countries from across the world making binding commitments to reducing their greenhouse gas emissions. The key word here is 'global': climate change affects us all, and it threatens our social and economic development. The consequences may be felt more quickly or acutely in some countries than others, but no-one is immune. For this reason, we need a shared and global effort, which involves all the countries of the world, to achieve an effective response to climate change.

We committed to reaching a new emissions reduction agreement at COP17 in Durban in 2011. At that time, Poland presided over the Council of the European Union. Together with Connie Hedegaard, EU Commissioner for Climate Action, we negotiated the basis of this agreement in the so-called 'Durban Platform'. The Durban Platform commits all countries to signing a new climate agreement in 2015, which will come into effect in 2020 when the Kyoto Protocol is due to expire.

In Warsaw we will again confront the two major problems related to climate change that the world must face. The first is how to achieve effective action aimed at reducing greenhouse gas emissions – often referred to as 'mitigation'. The second issue is how to adapt to the unavoidable changes in climate, like rises in sea levels or desertification, which

are already taking place or will happen shortly. In the discussions, some countries will emphasise the importance of taking ambitious action on mitigation. Others – understandably those countries, many of them developing, most affected by climate change – will focus on solving current problems and providing adequate finance for climate adaptation. My priority, as the President of the Summit, will be to ensure balance in this discussion and strike a consensus which recognises both the need for swift and effective mitigation action and the need to respond to the needs of the most vulnerable.

Warsaw marks an important stage in the journey towards a new climate agreement. Crucially, we need to advance consensus on the principles and rules which will underpin it, including complex issues around its legal form and its duration. We also need to draft an effective action plan to get us to the Paris summit in 2015. This is fast approaching, so a good start in Warsaw will be crucial for achieving a successful conclusion there. And what such a successful conclusion should look like? I believe that the agreement should have two characteristics – it must be truly global in its scope, and it must be fair.

We will start a discussion about an agreement which, for the first time in history, will see

194

countries from across the world making binding commitments to reducing their greenhouse gas emissions

To be global means that the agreement must be born from a process supported by all parties: it must enshrine commitments from all countries – not just the developed ones, as has been the case so far. Climate change is a global problem: all countries must unite in making a contribution to a worldwide mitigation effort. Fairness, on the other hand, entails ensuring a division of mitigation commitments which are tailored to the ability of countries to contribute. It must ensure a balance of obligations between developed and developing countries. My priority as the President of COP19 will be to ensure that the negotiating process in Warsaw runs in a democratic, transparent manner and which unites the parties in a sense of common responsibility. Only then will we be able to get all countries to sign up to a shared vision.

Emissions reductions are not just about high-level dialogue; above all, they are about practical action. That is why this year, during COP19, we are inviting business representatives to the talks. Business has the know-how, the tools and the experience the world needs to bring about emissions reductions in practice. Business is both a responsible actor in the greenhouse gas emissions story, and also a part of the solution because of the huge potential for mitigation which it holds. It is right that its voice should be heard in the discussion about climate.

In Warsaw, as at the COP16 conference in Cancun, we are also inviting the representatives of cities to the talks. Dialogue and knowledge sharing contribute to the sense of joint responsibility for the future of climate. They help us all to prepare for the complex measures we need to enact to achieve a successful agreement.

When Poland was announced as the host of COP19, many commentators, especially environmental groups, expressed doubts as to whether we were the right choice. In the international arena, Poland is often seen as a country which opposes climate policy. But of all the parties to the Kyoto Protocol, Poland has achieved one of the highest levels of greenhouse gas emissions reductions. Over the past 20 years, we have managed to reduce our emissions by over 30 per cent and to record GDP growth of more than 200 per cent. This success motivates us to further action. We would also like to share this success with other countries that are at the beginning of a similar journey towards a sustainable economy. I hope that the meeting in Warsaw will also provide us with an opportunity to share that experience.

COP19 will not be successful without all those attending it. We need a rational, fair and global climate policy, hoping for a full, frank and productive discussion.

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MARIA VAN DER HOEVEN
Executive Director, International Energy Agency

Green Growth

World energy trends are quickly changing, but they clearly remain unsustainable. Global needs are growing. Supply and demand patterns alter rapidly from region to region but are still deeply rooted in fossil fuels - as the supply surge from North American oil and gas production now rippling through global markets demonstrates. And - despite technological development and international efforts to promote 'cleaner' technologies - the carbon intensity of the global energy supply has barely changed over the past 20 years.

Yet the rapid growth of renewables continues to beat expectations, a bright spot in an otherwise bleak assessment of progress towards a cleaner and more diversified energy mix. Despite a difficult economic context, policy uncertainty in some countries, and turbulence in industry, the medium-term global outlook for renewables is positive. And we expect investment opportunities to grow, particularly in the power sector.

Indeed, according to our Medium-Term Renewables Market Report, electricity generation from hydropower, wind, solar and other renewable sources is projected to scale up by 40 per cent in the next five years. By 2016 global renewable electricity generation will overtake that of gas and be twice that of nuclear,: it will be second only to coal. And by 2018 renewable electricity will account for a quarter of the global power mix, up from 20 per cent in 2011. These forecasts build on impressive growth in 2012, when global renewable generation rose by over eight per cent despite a challenging investment, policy and industry context in some areas. In fact, renewables' rapid rate of growth, at least in electricity, is very much in line with what is needed to stay on the trajectory associated with IEA low-carbon energy scenarios.

Electricity generation from hydropower, wind, solar and other renewable sources is projected to scale up by

40%

In the next five years

Term Renewables Market Report

Overall, the deployment fundamentals of a portfolio of renewable sources remain robust, thanks to two key trends:

First, renewable power deployment is continuing to expand geographically - notably in emerging markets, mainly driven by fast-rising electricity demand, energy diversification needs, and local pollution concerns, while helping to mitigate climate change. China alone accounts for nearly 40per cent of expected global growth, and there is strong deployment in such other non-OECD markets as Brazil, India and South Africa. For the first time there is also significant development in the Middle East, based on compelling economics and long-term targets. Such rapid deployment is expected to more than compensate for slower growth and smooth out volatility in other areas, notably Europe and the US.

Second – though this is well-established for hydropower, geo-thermal and bio-energy - more renewables are becoming cost competitive versus fossil fuels in a wider set of circumstances. Wind, for example, competes well with new fossil fuel power plants in several markets, from Brazil to Turkey and New Zealand. Solar is attractive in markets with high electricity peak prices, as when these are set by oil-fired generation. Finally, the generation costs of decentralized PV have become lower than retail electricity prices in a number of countries, including Italy, Spain, Australia Denmark and (Southern) Germany. We expect this "socket parity" increasingly to become an additional driver for investment where and when PV can be self-consumed.

Of course renewables also face challenges. There is a heated debate about the costs (either real or perceived) of economic incentives for them at a time of stagnating or anaemic economic growth and energy demand in some European countries. Stiff competition from other sources - notably cheap coal everywhere

and shale gas in the US - raises a real question about the impact on competitiveness, which can be magnified by subsidies to fossil fuels in some markets. In several countries renewables still face important non-economic barriers, like burdensome authorisation procedures or issues of social acceptance. And they can also fall victim to their own success – particularly in markets where the share of wind and solar PV is such that grid integration challenges must be addressed.

Indeed, the success of renewables leaves no room for government complacency, especially among OECD countries. Policy uncertainty represents the largest barrier to investor confidence. Many renewables no longer require high economic incentives or subsidies, but they do need long-term policies that continue to provide a predictable and reliable market and regulatory framework compatible with societal goals.

Over

70%

of global energy demand is now consumed in cities, where roughly half the world's population lives – and that will grow substantially by 2050, when 70 per cent of people will reside in them.

But this is just part of the solution. Improvements in energy efficiency remain the largest single source of the carbon reduction needed to achieve international targets. Progress is inadequate. Global improvements are difficult to measure, but global energy intensity (a measure of the amount of energy required to produce a unit of GDP) has remained largely stable, reversing a historical trend of improvement. Maintaining the status quo is not enough: the pressing need to transition toward a clean energy economy depends on improving efficiency across a host of sectors.

Effective policy to encourage energy efficiency must follow. There are huge potential gains. The World Energy Outlook 2012 showed that it accounts for 42 per cent of the carbon savings to 2035 between the greener "450" scenario (consistent with a 2 degree Celsius trajectory) and the baseline "New Policies" scenario. A special "Efficient World" scenario shows what can be achieved by then simply by adopting known best technologies. Global energy demand is cut by half compared to the baseline scenario, oil demand peaks by 2020 and savings in natural gas equal US production in 2010.

As urbanization increases, particularly in the developing world, urban energy policy design - including smart transport and efficient buildings - will be particularly key. Over 70 per cent of global energy demand is now consumed in cities, where roughly half the world's population lives – and that will grow substantially by 2050, when 70 per cent of people will reside in them. Urban energy efficiency policies should strive to create an effective link between national, regional, and local needs. The most important areas to address include city planning, energy efficiency in buildings, transport, and energy generation, distribution and delivery. Analysing the impact of policies in these areas requires a cross-sectoral approach, since efficiencies typically show up across the system. The link between energy and transport may be apparent, but less obvious interdependencies - such as the interplay of energy policies with waste and water management - can also be important.

Understanding such a constellation as a market is a relatively new undertaking. At this year's World Energy Congress, the IEA will launch its first Energy Efficiency Market Report - joining our series of such reports on coal, oil, gas, and renewable energy, and highlighting the

importance we place on it as a "hidden fuel". In general, energy efficiency represents an important potential alternative to investing in traditional supply-side fuels, and provides important benefits to countries looking to balance energy supply with a demand profile that supports sustainable economic growth. Country case studies in the report show that energy efficiency delivers improved service, economic productivity and consumer benefits, and reduced demand growth as well as avoiding the need for new supply infrastructure.

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In difficult economic times we are often asked whether societies can afford expensive clean energy policies. The answer is yes. The cost of delay is higher in many respects. As the Efficient World Scenario shows, smart cost-effective energy efficiency actions can cut fuel bills by 20 per cent on average to 2035, boosting the global economy by a cumulative $18 trillion. Meanwhile renewables now provide a portfolio of well established and increasingly affordable sources of electricity, where the resources are of good quality and the right policy and market framework is in place. The most successful renewable technologies may not provide a 'silver bullet', but they benefit from favourable cost curves and competitiveness in a growing set of applications. The question is not whether more renewables and greater efficiency are needed, but where and when.

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RAJENDRA K. PACHAURI
Director-General, The Energy & Resources Institute (TERI) and Chairman, Intergovernmental Panel on Climate Change (IPCC)

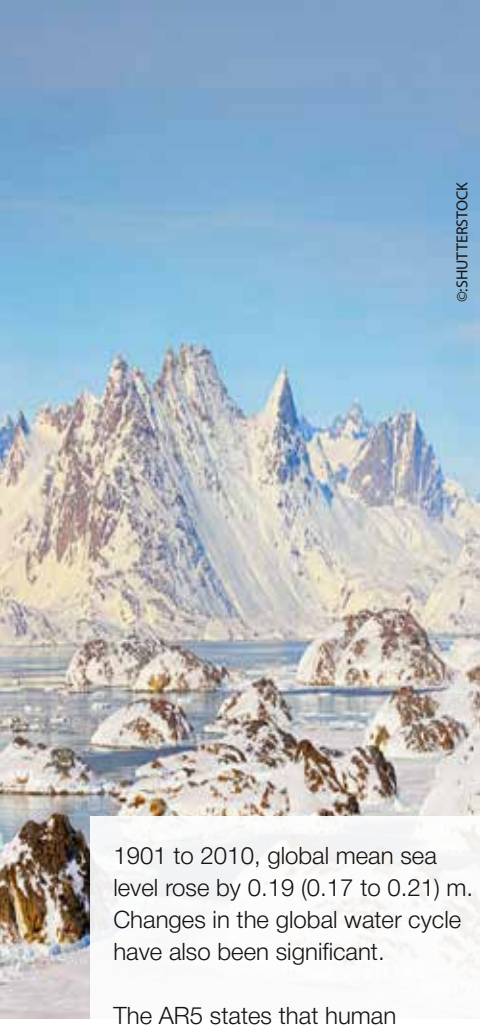
Advancing our Understanding

The IPCC's Fourth Assessment Report (AR4) came up with findings to show that the impacts of climate change would exacerbate several stresses already existing on account of other factors, and that if the world moves towards reducing emissions of greenhouse gases (GHGs) there are major co-benefits such as higher energy security and reduction in local pollution which would enhance health benefits.

Its Fifth Assessment Report (AR5) is now in the final stages of preparation, but a significant contribution has already been made by the publication of the Working Group I (WG I) report in September, assessing and citing 9200 separate publications, almost two-thirds of which have been published since 2007, when the AR4 was completed. So this report contains the latest updated information, clearly advancing our understanding of the physical science basis of climate change. The WG I report has brought out several significant findings, all of which add further weight and confidence to those of the AR4. In several cases it provides new estimates and quantitative information not available in 2007. The AR4, for example, clearly brought out that warming of the climate system is unequivocal, and this has received further elaboration in the WG I report, which states that many of the observed changes since the 1950s are unprecedented over decades to millennia.

It also concludes that each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983–2012 was likely the warmest 30-year period of the last 1400 years. Warming of the climate system has led to diminishing of amounts of snow and ice. Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent.

Two factors are responsible for the increase in sea levels across the globe - melting of bodies of ice and thermal expansion due to warming of the oceans. The AR5 states that the rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia. From



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1901 to 2010, global mean sea level rose by 0.19 (0.17 to 0.21) m. Changes in the global water cycle have also been significant.

The AR5 states that human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. It states as extremely likely (the term signifies a probability of over 95 per cent) that human influence has been the dominant cause of the observed warming since the mid-20th century. The term used in the AR4 was "very likely", which represents a probability of 90 per cent or above - so the level of confidence has been upgraded.

It was found to be virtually certain that global mean sea level rise will continue for many centuries beyond 2100. The few available model results that go beyond 2100 indicate global mean sea level rise above the pre-industrial level to be less than 1 m by 2300 for a radiative forcing that corresponds to CO2 concentrations that peak, decline and remain below 500 ppm. But it is projected at 1 m to more than 3 m for one corresponding to a CO2 concentration between 700 ppm and 1500 ppm.

Sustained mass loss by ice sheets would cause larger sea level rise: part of the loss might be irreversible. There is high confidence that sustained warming greater than some threshold – currently estimated at 1°C to about 4°C above pre-industrial - would lead to the near-complete loss of the Greenland ice sheet over a millennium or more, causing a global mean sea level rise of up to 7 m. Abrupt and irreversible ice loss from potential instability of marine-based sectors of the Antarctic Ice Sheet in response to climate forcing is possible, but current evidence and understanding is insufficient to make a quantitative assessment.

Human influence is likely to have contributed to

95%

of the observed warming since the mid-20th century

Fifth Assessment Report (AR5)

The AR5 also assesses geo-engineering options, but a comprehensive understanding of these will only be available when its other reports have been completed. The findings of the WG I report provide us with adequate confidence to believe that we will get many new insights from the rest of the four-volume assessment. But the world already has enough knowledge from the AR4 to take steps and actions to meet the challenge of climate change effectively. That report clearly stated that neither adaptation nor mitigation alone can avoid all climate change impacts, but that they can complement each other and together significantly reduce the risks of climate change.

Many impacts can be reduced, delayed or avoided by mitigation and this would have substantial co-benefits such as higher energy security, lower levels of local pollution and, therefore, major health benefits. Even without these co-benefits, the AR4 had found that a stringent mitigation strategy - stabilizing GHG levels at 445-535 ppm of CO2 equivalent - would cost no more than 3 per cent of global GDP in 2030. It added that bottom-up studies suggest that mitigation opportunities with net negative cost could reduce emissions by about 6 GtC CO2 equivalent per year in 2030 if barriers to implementation were dealt with. The economic mitigation potential - generally greater than market mitigation potential - can only be achieved when adequate policies are in place and barriers removed. Instituting proper measures and frameworks for effective action, therefore, remains the clear objective of a sound global strategy to minimise the risks associated with climate change.

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MARGARET CHAN
Director-General, World Health Organization

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Healthy measures

Prevention and preparedness are the heart of public health. Risk management is our daily bread and butter. The climate is changing, with multiple and often severe consequences for health. Data on climate variability provide a solid foundation for risk management, especially in the developing world, where the health consequences of climate change will hit the hardest.

Climate and weather affect the air people breathe, the food they eat, and the water they drink. Climate change is already affecting agriculture and food security, disaster risk management, and the availability of fresh water. Climate variables contribute to natural disasters, with their related population displacements, lost livelihoods, destroyed infrastructures, and conditions

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of crowding and filth that favour explosive outbreaks of disease. Diarrhoeal diseases, the second biggest killer of young children worldwide, flourish under such conditions.

Many of the world's most worrisome diseases have transmission cycles that are profoundly shaped by conditions of heat and humidity and patterns of rainfall. Malaria is a prime example. Its parasites, and the mosquitoes responsible for transmission, are highly sensitive to climate variability, which has been repeatedly linked to epidemics. Scientists use climate data sets, based on advances in seasonal forecasting, to predict unusual increases in malaria transmission and facilitate preparedness. Doing so is critically important, as a child infected with malaria can die within 24 hours in the absence of medicines.

Malaria matters greatly. In endemic areas, and especially in Africa, it is the single biggest health-related barrier to economic development. WHO estimates that it causes more than 200 million clinical cases and kills around 650,000 people each year, mostly young children in sub-Saharan Africa.

Epidemic-prone diseases, like cholera, dengue, and bacterial meningitis also infect large numbers of people, and all are highly sensitive to climate variability. Cholera is a close companion of heavy rainfall and floods, but epidemics can also be ignited by drought conditions that compromise water safety and food and personal hygiene. Worldwide, more than 50 countries report cholera outbreaks to WHO every year.

In just the past decade, the significance of dengue as a threat to health and economies has increased dramatically. More countries are reporting their first cases. More outbreaks are explosive in ways that severely disrupt societies and drain economies. Crippling urban outbreaks are of particular concern, as the mosquito that transmits dengue has adapted to breed in water stored near homes or in articles of urban garbage no bigger than a plastic cup.

Malaria causes more than

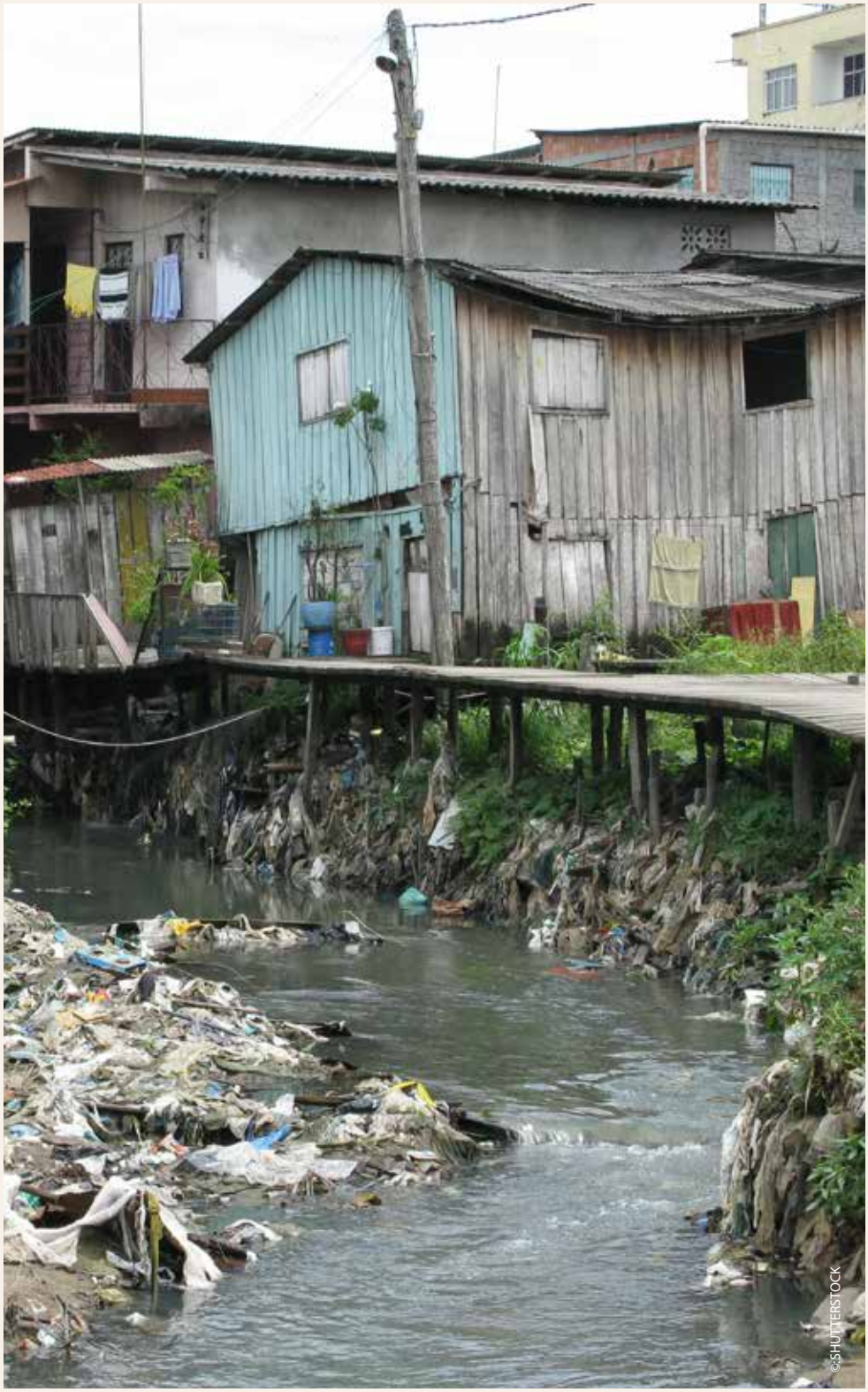
200,000,000

clinical cases and kills around 650,000 people each year, mostly young children in sub-Saharan Africa

WHO estimates

Bacterial meningitis is probably the most dreaded of all infectious diseases in sub-Saharan Africa, as it leaves so many of its young survivors with permanent brain damage or hearing loss. Nearly every year, deadly and debilitating epidemics sweep through Africa's meningitis belt, killing half of those infected if they fail to receive treatment. What actually sparks these epidemics is not yet fully understood, but the link to climate is strong. Epidemics consistently arrive together with the hot, dusty Harmattan winds.

For all of these diseases, stronger climate services in endemic countries can help predict the onset, intensity, and duration of epidemics. Such predictions go to



the heart of public health: that is, prevention and preparedness. The epidemics have a huge potential for social disruption and make enormous logistical demands on response teams. Knowing what may be on the horizon allows health officials to pre-position medicines, vaccines, and other interventions that help keep the death toll down.

Climate also influences the emergence of new diseases. Nearly 80 per cent of all new human diseases originate in domestic or wild animals. Climate variables, including those that influence the availability of food and water, have a direct impact on wild animal populations, their concentrations, and their incursion into areas inhabited by humans.

Climate-related shifts in animal populations can allow an animal pathogen to jump the species barrier and infect humans, as in the case of Nipah virus in Malaysia, and Hanta virus in the US. In the latter case, the emergence of a severe new respiratory disease was linked to a long period of drought, followed by heavy rainfall, that affected populations of deer mice.

As another example, migratory birds can spread diseases like West Nile fever and the deadly H5N1 avian influenza across continents and oceans. Migration is triggered by environmental conditions, including winds and events like cold fronts. When these diseases have an intermediate host - like pigs for Nipah virus and poultry for avian influenza - the economic costs can be enormous.

For all these diseases, what WHO and its Member States want is to move from a reactive response in an emergency situation to proactive risk assessment, early warning systems, and preventive measures. Climate services offer a powerful resource for doing so.

One advantage of working in public health comes from the fact that patterns of disease and their trends, whether positive or negative, can be more precisely measured than most of the things that can be affected by a changing climate. Climate change is already having an effect on disease patterns and trends. As the world's climate continues to change, the links with health will become increasingly apparent. Solid evidence of the impact on people's lives, livelihoods, and health ought to give weight to the many arguments for taking climate change seriously – and taking action.

NUMBERS

30 million

Rapidly reducing methane and black carbon could prevent over two million premature deaths and avoid crop losses of over 30 million tons annually. It could also slow down the warming expected by 2050 by about 0.5 degree C – almost halving projected near-term warming – **UNEP**

19%

An estimated 19 per cent of global black carbon emissions come from the transportation sector – **Climate and Clean Air Coalition (CCAC)**

25%

The United States contributes 25 per cent of emissions into the atmosphere even though the US only makes up five per cent of the world's population - **The global warming overview**

18%

Livestock farming accounts for around 18 per cent of our global greenhouse gas emissions - more than the global transport sector — **FAO**

20%

The oil and gas sector accounts for more than 20 per cent of all anthropogenic emissions of methane globally - **CCAC**

3rd largest

Municipal solid waste landfills are the third largest source of global methane emissions - **CCAC**

1/3

Added heat stress, shifting monsoons, and drier soils may reduce yields by as much as a third in the tropics and subtropics, where crops are already near their maximum heat tolerance — **UNEP**

90%

About 90 per cent of the sun's heat is absorbed by greenhouse gases and radiated back toward the surface, which is warmed to a life-supporting average — **NASA**

1750

Since 1750, the average amount of energy coming from the Sun either remained constant or increased slightly — **NASA**

34 million

34 million acres of trees are cut and burned each year resulting in 25 per cent of all carbon dioxide release entering the atmosphere — **NASA**

30%

Around 30 per cent of the sun's energy that reaches the Earth is reflected back into space - **Environmental Defense Fund**

1 million+

More than a million species face extinction from disappearing habitat, changing ecosystems, and acidifying oceans - **National Geographic News**

Our diets account for up to twice as many greenhouse emissions as driving - **New Scientist**

WWWs

www.cop19.gov.pl/
Official government web site for COP19

www.cop19.org/
All you need to know about what is happening at COP19

www.unep.org/ccac
Climate and Clean Air Coalition to reduce short-lived climate pollutants

www.globalchange.gov/
The US Global Change Research Program (USGCRP) coordinates and integrates federal research on changes in the global environment and their implications for society

http://www.iea.org/topics/climatechange/
International Energy Agency – working together to ensure reliable, affordable and clean energy

http://sustainability.thomsonreuters.com
This site from the ThomsonReuters Foundation aims to provide additional insight on the global field of Sustainability from experts working in specialist fields such as Climate, Energy, Health, Law and Corporate Governance. The Youth Perspectives section is intended to provide a voice for the next generation, for whom decisions today will be especially impactful

www.cleancookstoves.org
The Global Alliance For Clean Cookstoves is a public-private initiative to save lives, improve livelihoods, empower women, and protect the environment by creating a thriving global market for clean and efficient household cooking solutions

MAKING THE SWITCH TO EFFICIENT LIGHTING

5%

of worldwide green house Gas Emissions (GHG) is contributed by electricity lighting

The problem

Lighting from electricity accounts for approximately 15 per cent of global energy consumption and five per cent of worldwide greenhouse gas emissions (GHG). Unless policies are implemented immediately to address this issue, overall energy consumption for lighting will have grown by 60 – 70 per cent by 2030 with dramatic consequences for climate change. The phase-out of inefficient incandescent lamps provides one of the easiest and most cost-effective ways to reduce carbon emissions.

The solution

The UNEP “en.lighten” initiative supports countries in implementing policies and concrete measures that will accelerate market transformation to efficient lighting technologies. A target date for the global phase-out of all inefficient lighting has been set for the end of 2016.

In order to mobilize efforts to make the global transition to efficient lighting a reality, UNEP has convened government representatives and international lighting experts from over 40 organizations representing 30 countries, to provide guidance on the development and implementation of successful efficient lighting strategies.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The impacts

shifting to energy efficient lighting significantly lowers electricity bills, reduces energy imports, improves end-user welfare and reduces carbon dioxide ($CO_{2)}$ emissions. In fact, the replacement of all inefficient on-grid and off-grid lighting in the world yield annual cost savings of over US$140 billion and would also achieve annual CO2 reductions of 580 million tonnes, more than the emissions of the entire United Kingdom.

As part of the en.lighten initiative, UNEP has published Country Lighting Assessments for over 150 countries for on-grid and for 80 countries for off-grid lighting. The Country Lighting Assessments highlight the energy, financial and CO2 savings potential of efficient lighting. It also published the online global policy map for efficient lighting that provides an overview of readiness of countries with regard to efficient lighting policies, programmes and successes.

Support

en.lighten initiative is a proven example of a successful public private partnership. It was launched between UNEP and OSRAM, Philips Lighting and the National Lighting Test Centre of China, with the support of the Global Environment Facility and most recently, the Australian Government. ***www.enlighten-initiative.org***

Success Story

Over 50 countries have joined the Global Efficient Lighting Partnership Programme and committed to achieving a coordinated global transition to energy efficient lighting by the en.lighten target date of 2016. Direct support has been provided to 27 countries for the development of national or regional efficient lighting strategies.

Better health, better agriculture, better climate by tackling short-lived climate pollutants

The problem

Short-lived climate pollutants are agents that have a relatively short lifetime in the atmosphere – a few days to a few decades – and a warming influence on climate. The main short-lived climate pollutants are black carbon, methane, hydrofluorocarbons (HFCs) and tropospheric ozone, which are the most important contributors, after CO2, to the human enhancement of the global greenhouse effect. These short-lived climate pollutants are impacting the public health, food, water and economic security of large populations, both directly through their impacts on human health, agriculture and ecosystems, and indirectly through their effects on climate. Short-lived climate pollutants have become a major development issue that calls for quick and significant worldwide action.

The solution

The Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC) is the first global effort to treat short-lived climate pollutants as an urgent and collective challenge. It is working to produce rapid reductions in these harmful pollutants to protect human health and the environment now, and to slow the rate of climate change within the first half of this century. Organized as a partnership of governments, inter-governmental organizations and non-governmental organizations, and hosted by UNEP, the CCAC

is designed to leverage high-level political will to catalyze global action.

To help achieve its objectives, the CCAC has so far launched ten high-impact global Initiatives. These provide strategic direction for the work of the Coalition, as well as the efforts of individual partners, to promote rapid delivery of climate and clean air benefits to accelerate emission reductions across key sectors and pollutants. The development and implementation of each Initiative is led by several Partners in a collaborative process.

The impacts

The CCAC is working with governments to advance and implement regulations and mechanisms to address emissions from heavy-duty vehicles, develop a global sulphur strategy and green freight charter, and build partnerships with the private-sector.

Brick production has been identified as an important area where substantial emission reductions can be made for black carbon and other pollutants, and a global awareness-raising campaign is underway to increase political attention and build capacity to mitigate the impacts from brick production.

CCAC partners are engaging with municipal and national governments to reduce emissions of short-lived climate pollutants across the municipal solid waste sector. This initiative provides a comprehensive collection of resources for cities, including technical assistance, information exchange, networking, and training. Work has started in 10 cities that will act as ambassadors in their countries and regions for showcasing best practices and sharing lessons learned with other interested cities.

The CCAC is also encouraging the building of capacity and developing of national-level inventories of HFCs; working with a group of companies and countries in the oil and natural gas sector to collaboratively design mechanisms and voluntary commitments to achieve substantial emission reductions from natural gas venting, leakage, and flaring; working with interested national governments to support the rapid roll-out of national action planning for SLCP mitigation; working with governments, the private sector, donors, financial institutions, expert groups and investors' networks to identify barriers to financing and implementation of short-lived climate pollutant reduction projects; working to speed the pace of reductions in emissions of short-lived climate pollutants from the household cooking and heating sector in developing and developed countries; and ramping up planning for the first regional Assessments of short-lived climate pollutants, to be conducted in Latin America.

72

Partners have joined CCAC since its inception in February 2012

Success story

The CCAC began in February 2012 with seven partners, including Bangladesh, Canada, Ghana, Mexico, Sweden, the United States and UNEP. The issue of short-lived climate pollutants was relatively unknown at the time. In 18 months the partnership has grown to 72, including 33 governments and the European Commission, along with 38 non-state partners. Short-lived climate pollutants are now a topic for discussion in forums and other events on climate change and the environmental and the human impact of air pollution. ***www.unep.org/CCAC***

YANGYANG XU
Scripps Institution of Oceanography, University of California, San Diego
DURWOOD ZAELKE
Founder and president of the Institute for Governance and Sustainable Development

Unpacking the Problem

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Climate change and its impacts are coming faster - and are worse - than was projected just six years ago. The fifth assessment report by the Intergovernmental Panel on Climate Change, concludes that carbon dioxide concentrations are now higher than at any time in the past 800,000 years and that the world is on a path towards temperatures unprecedented in the last several million years. Yet a growing body of research shows that - with rapid and aggressive mitigation action - the worst projected impacts can still be avoided and global temperature rise can be held at or below 1.5 to 2°C by the end of the century. In that spirit, the world has just taken an important step towards solving one of the fastest growing climate problems. The leaders of the G-20 nations, joined by Ethiopia, Spain, Senegal, Brunei, Kazakhstan, and Singapore, announced their support for using the Montreal Protocol to phase down production and consumption of hydrofluorocarbons (HFCs).

Addressing HFCs under the Montreal Protocol is just part of a growing global strategy to unpack the global climate problem and address its component parts through the parallel International Cooperative Initiatives (ICIs) while keeping accounting and reporting of emission reductions under the UN climate treaty. Fast action under these 'ICIs', including the Montreal Protocol and the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants, are helping immediately to solve pieces of the climate problem.

This diversified strategy is gaining momentum, partly through growing recognition that - while long-lived greenhouse gases such as carbon dioxide (CO_2) and nitrous oxide (N_2O) represent more than half of current climate change - the rest is driven by short-lived climate pollutants (SLCPs) such as black carbon, methane, tropospheric ozone, and HFCs. Mitigating these gases and aerosols provides climate benefits on different time scales, with SLCPs delivering significant benefits in the near-term and CO_2 providing its benefits

later. Aggressive and immediate reductions in both long-lived and short-lived pollutants are necessary for near-term climate protection and long-term climate stabilization, and the ICI approach recognizes that the fastest way to address these very different climate pollutants will often involve different fora.

The leading example of the ICI unpacking strategy is the current effort to use the Montreal Protocol to phase down production and consumption of HFCs, while leaving the accounting and reporting of HFC emissions under the jurisdiction of the climate treaty, In June we and colleagues published a new study in Atmospheric Chemistry and Physics, highlighting how important this unpacking strategy can be, and confirming the importance of immediately cutting high-GWP (global warming potential) HFCs.

HFCs are the fastest growing greenhouse gases in many countries including the US, EU, China, and India, and are increasing globally by 10 to 15% per year. They are powerful climate forcers with warming effects hundreds to thousands of times greater per tonne than CO2. While their overall contribution to the current climate change is small, without intervention, by mid-century the climate forcing of HFCs at 2050 could increase by 20-30 fold by 2050. Equivalently, sSuch an increase of HFC forcing would be the equivalent isof up to to the equivalent of 30 to 45 per cent % of the forcing increase of CO2 increase between now and 2050..between 6-13 years of projected 2050 CO2 emissions.

Our study shows that replacing high-GWP HFCs with available low-GWP alternatives can avoid 0.1°C of warming by 2050 and 0.5°C by the end of the century. When combined with cuts in the other three SLCPs, as much as 0.6°C of warming could be avoided by 2050 and as much as 1.5°C by the end of the century. Aggressive CO2 mitigation, replacing high-GWP HFCs with low-GWP alternatives, and cutting black carbon, methane, and tropospheric ozone, together provide the greatest chance of keeping global temperatures below 1.5°C for the next 30 to 40 years and below the 2°C goal up to 2100.

Phasing down high-GWP HFCs under the Montreal Protocol represents the biggest, fastest, and most reliable near-term climate mitigation opportunity available. It is also likely to be the cheapest, as the cost of phasing down refrigerants under the Montreal Protocol has historically been less than 10 cents per tonne of carbon dioxide equivalent.

Two proposals have been advanced to phase down high-GWP HFCs under the Montreal Protocol; one by the Federated States of Micronesia, co-sponsored by Morocco and the Maldives; the other by the North American countries, Mexico, Canada, and the US. The proposals are similar, and each would reduce 85-90 per cent of HFC production and use, avoiding the equivalent of 100 billion tonnes of carbon dioxide by 2050,

HFCs are the fastest growing greenhouse gases in many countries including the US, EU, China, and India, and are increasing globally by 10 to 15% per year.

and substantially eliminating one of the six Kyoto Protocol greenhouse gases.

Historically, countries such as India and China have been reluctant to address HFCs under the Montreal Protocol, worrying about the availability of economically and technically available alternatives, and sufficient funding to cover the cost of a phase-down. However, this summer, in two separate agreements, both President Xi Jinping of China and Prime Minister Singh of India agreed to work with the US and the international community to phase down HFCs under the Protocol. Their commitments parallel the G20 Leaders' Declaration in early September which announced support for initiatives complimentary to efforts under the UN Framework Convention on Climate Change, including using the expertise and institutions of the Montreal Protocol to phase down the production and consumption of HFCs, while retaining HFCs within the scope of the UNFCCC and its Kyoto Protocol for accounting and reporting of emissions. Further progress was made at the Montreal Protocol's annual Meeting of the Parties in October, yet, much work remains in 2014 to finish building the consensus for the HFC phase-down.

Phasing down high-GWP HFCs under the Montreal Protocol and similar actions in other ICIs can do much more that produce immediate climate mitigation benefits. This diversified strategy can prove that fast progress on climate mitigation is possible, instill the urgent optimism needed to build political momentum to succeed with the new UN climate treaty in 2015, and succeed in the ultimate objective agreed by the world community twenty years ago to stabilize 'greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.'

Fast and refreshing

ROMINA PICOLOTTI
President, Center for Human Rights and the Environment, Argentina

"The seeker" says the American author Wally Lamb "embarks on a journey to find what he wants and discovers, along the way, what he needs." It's been a bit like that for the Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants (CCAC), which is dedicated to reducing black carbon, methane, tropospheric ozone, and hydrofluorocarbons or HFCs.

It has been found that taking action on these pollutants can save millions of lives and reduce crop losses by 30 million tonnes every year – and cut the current rate of global warming in half at the same time. In fact, reducing Short–Lived Climate Pollutants (SLCPs) is critical for slowing the rate of climate change over the next several decades and for protecting the people and regions most vulnerable to near-term climate impacts.

In 2012, six governments and UNEP launched the CCAC at the urging of civil society, based on decades of scientific research. Less than two years later it has 72 Partners, a Trust Fund, a High Level Scientific Advisory Panel and has approved and launched nine initiatives to scale up action to reduce SLCPs.

These pollutants share a relatively short lifetime in the atmosphere - a few days to a decade and a half - and a warming influence on climate. They are together responsible for nearly half of the anthropogenic radiative forcing. At the same time, black carbon, methane and tropospheric ozone are also dangerous air pollutants, with various detrimental impacts on human health, agriculture and ecosystems.

Due to their short lifetimes compared to CO2 - which remains in the atmosphere for millennia - actions to reduce SLCPs will quickly cut their atmospheric concentrations, yielding a relatively rapid climate response that lowers the temperature. Fast action to reduce two of the SLCPs - black carbon and methane—has the potential to cut the rate of warming worldwide by half, and by two-thirds in the Arctic. A phase-down of HFCs would prevent another 20 per cent of warming.

The CCAC is open to countries and non-state actors committed to taking action on short lived climate pollutants who wish to join in this global effort. Partners expressly recognize that action on SLCPs must complement and supplement, not replace, global measures to reduce carbon dioxide, and, in particular, efforts under the UN Framework Convention on Climate Change.

The CCAC has raised both interest and doubts among governments and other actors, who have questioned whether it is merely an effort to dilute the responsibility of the North to address climate change. However as the CCAC strengthens its actions, some of these suspicions have begun to fade away. The CCAC is not a negotiating forum and States should not join it to negotiate an international climate agreement. Rather, they should join because they see an opportunity to buttress their work on sectors which traditionally have been left off the political agenda or have been difficult to address in isolation, but where CCAC could help - such as waste management, brick kilns, oil industry leakages, clean air, finance and the strengthening of institutions.

This is a platform to enhance action, and a very attractive and useful one for governments who want not only to tackle issues at home that will immediately improve their citizens' lives but also strategically to influence international action. Partners are working in a spirit of cooperation and with a sense of urgency and are beginning to take action on many fronts. CCAC is just in its first stages and there is still a long way to go, but so far the journey has been refreshing.


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Clean living

Africa's biggest wind farm has begun production in Ethiopia, aiding efforts to diversify electricity generation from hydropower plants and help the country become a major regional exporter of energy

The 210 million euro ($289.68 million) Ashegoda Wind Farm was built by French firm Vergnet SA with concessional loans from BNP Paribas and the French Development Agency (AFD). The Ethiopian government covered nine per cent of the cost.

It consists of 84 hi-tech turbines towering above an arid region where villagers herd cattle and ride donkey-drawn carts as they have for generations.

"Various studies have proved that there is potential to harness abundant wind energy resources in every region of Ethiopia. We cannot maintain growth without utilizing the energy sector," Prime Minister Hailemariam Desalegn said in a speech at the launch.

The project, outside Mekelle in Tigray state, about 475 miles north of the capital, Addis Ababa, has a capacity of 120MW and will produce about 400m KWh a year. It was completed in phases over three and a half years and has produced 90m KWh for the national grid.

The Horn of Africa country - plagued by frequent blackouts - plans to boost generating capacity from 2,000 MW to 10,000 MW within the next three to five years, much of it coming from the 6,000 MW Grand Renaissance Dam under construction on the Nile.

The plan also consists of raising wind power generation to more than 800 MW and geothermal capacity to less than 100 MW.

A boy stands near one of Ashegoda's 84 wind turbines.

84

Number of hi-tech turbines at Ashegoda Wind Farm

Bamboo Bikes: They are going from the strength to strength. This mountain bike retails for over $2,000 after passing numerous road tests. Bamboo is stronger than steel, and it doesn't shatter like carbon fibre or dent like aluminium. It also makes for a responsive yet comfortable ride, as the stiff frame absorbs vibration.

Rocket Stove: Ideal for many third-world countries, the Rocket achieves efficient combustion, effective use of heat and airflow, as well as safe operation and maximum usability.

UNEP scored a big hit this October when international football star **Yaya Touré** joined the fight against the illegal ivory trade.

As the latest Goodwill Ambassador for the United Nations Environment Programme (UNEP), he pledged to combat soaring poaching which has led to thousands of African elephants slaughtered each year.

Mr. Touré joins the roster of other Goodwill Ambassadors-Brazilian supermodel Gisele Bündchen, US actor Don Cheadle, Chinese actress Li Bingbing, French photographer Yann Arthus Bertrand and Indian economist Pavan Sukhdev-to help generate public awareness and understanding of environmental causes.

Touré, African Footballer of the Year in 2011 and 2012 and an inspirational figure for Manchester City and his national side Côte d'Ivoire, travelled to the headquarters of UNEP in Nairobi, Kenya-a country that is facing a massive spike in poaching-to accept his nomination.

"Côte d'Ivoire's national team is named 'The Elephants' after these magnificent creatures that are so full of power and grace, yet in my country alone there may be as few as 800 individuals left," Touré said. "Poaching threatens the very existence of the African elephant and if we do not act now we could be looking at a future in which this iconic species is wiped out."

"I became a UNEP Goodwill Ambassador to spread the message that this poaching- and other forms of wildlife crime-is not only a betrayal of our responsibility to safeguard threatened species, but a serious threat to the security, political stability, economy, natural resources and cultural heritage of many countries," he added.

Increased poaching and loss of habitats are decimating African elephant populations-especially in Central African countries-according to a report entitled "Elephants in the Dust - The African Elephant Crisis", released in Bangkok in March at the meeting of the Convention on International Trade in Endangered Species (CITES).

The UN estimates that over 17,000 elephants were illegally killed in monitored sites in 2011 alone. Overall figures may be much higher. The extent of the killings now far exceeds the natural population growth rates, putting elephants at risk of extinction, especially in Central and Western Africa. But even previously secure populations, such as those in East Africa, are now under threat.

"We are honoured that Mr. Touré has agreed to be a Goodwill Ambassador," said UN Under-Secretary-General and UNEP Executive Director Achim Steiner. "His personal commitment to an environmentally sustainable lifestyle and his global status as an internationally renowned sportsman makes him a particularly powerful African voice to speak and inspire action on the environmental challenges and the solutions to these challenges."

To download the Elephants in the Dust report, please visit the following link: http://www.grida.no/publications/rr/elephants/

©COURTESY OF SARA TURNER

Sarah Turner is an award winning eco artist and designer making beautiful lighting and works of art from waste plastic bottles.

After graduating from Nottingham Trent University in 2008 with a degree in Furniture and Product Design, she set up her design business. With designing and making products from waste materials always being a passion, she quickly became obsessed with collecting and creatively reusing waste plastic bottles.

All the bottles are collected locally from cafes and households to be reincarnated into a new life. These bottles are then cleaned and sandblasted to turn the plastic from being transparent to opaque.

The bottles are then dyed the gorgeous, vibrant colours. Then with some intricate, highly skilled cutting and sculpting the bottles are completely transformed into these stunning high end products and it's almost impossible to tell what they originated from. Sarah's designs prove that.... "just because a product is made from rubbish, it doesn't mean it needs to look like it does!"

Nova

Nova is Sarah's latest design made from hundreds of melted waste plastic bottles. The plastic bottles are sandblasted to make some areas of the bottle opaque, then they are hand cut and melted to give the gorgeous look.

Sarah is very proud of the new melting technique she has developed saying:

'I love the new look, most people think the light is actually made from glass and only on closer inspection do they realise it's plastic bottles.'

The chandelier is named as it resembles a star exploding like a Supernova!

This design is made to order and can be made in various styles and any colour. The photographed chandelier is 1.2 metres in diameter and uses 250 waste plastic bottles.

Ella

Ella is hand made from the ends of different sized plastic drinks bottles. The light was initially nicknamed 'Ella' when it was being made as it resembled an umbrella... but the nickname stuck!

The ends of each plastic bottle are cut off simply with a pair of scissors. Don't worry, the rest of the bottle doesn't go to waste, they are all used in other designs Sarah makes. The bottle ends are then sandblasted to turn them white then skilfully pieced together by hand gradually building the gorgeous round shape.

Sarah says:

"The ends of plastic bottles are a gorgeous form, it's a shame you don't really get to see them. Ella really shows off this part of the waste material."

The first Ella Sarah made was huge at over one metre wide and used 310 plastic bottles! This original Ella was first displayed at the Ideal Home Show in their full sized show home at Earls Court. The design has since been exhibited in many different shows including Designers Block, Tent London and Nottingham Castle and has gone on to win awards.

" I really wanted to include my Cola 30 light, I thought the contrast between the whole plastic bottles and the transformation they go through with the Cola 30 was a fantastic thing to show"

Coca Cola Chandelier

Coca Cola first noticed Sarah's work over a year before the Olympics. They decided that Sarah was the right person for the job to design and make the Lighting and Sculpture for their Hospitality Centre at the London 2012 Olympic Park. The lights really make a statement being 2 metres wide and are made using 190 plastic Coca Cola bottles each. There are 5 of the large lights in total, each is made up of rings of the plastic bottles and a globe in the middle.

Sarah says: «I wanted the lights to have an Olympic look to them which is why I chose the circular disks with rings of the plastic bottles, reminiscent of the Olympic rings. I also liked the classic looking light bulbs, it reminded me of the infamous Coca Cola Christmas truck.»

The globe is Sarah's Cola 30 design which are made from of course 30 Coca Cola bottles hand cut and sculpted into decorative forms. This was the design Coca Cola first noticed and expressed interest in, after all it is made using their bottles and is named after them!

Sarah says: " I really wanted to include my Cola 30 light, I thought the contrast between the whole plastic bottles and the transformation they go through with the Cola 30 was a fantastic thing to show".

SHEILA WATSON
Executive Secretary, Global Fuel Economy Initiative

Driving change

The number of cars on the planet is set to triple by 2050, with the vast majority of those new vehicles owned and driven in non-OECD countries. Some of these countries have already begun to grapple with the implications of this growth in personal mobility. Others are less well prepared, and are facing an increase in domestic demand for road space, and for fuel, which for them – and ultimately for the whole planet – will be entirely unsustainable. So our shared challenge is to find a way to reconcile legitimate aspirations for mobility - and the developmental benefits which can ensue - with an ambitious reduction in fuel use and CO2 from cars worldwide.

The Global Fuel Economy Initiative (GFEI) exists, with its secretariat at the UK-based FIA Foundation, to promote global debate and discussion around fuel economy in light duty vehicles. With partners ranging from global bodies such as the International Energy Agency, International Transport Forum, and United Nations Environment Programme, to such technical experts as the International Council on Clean Transportation, and the University of California Davis Institute for Transportation Studies, it brings huge experience and understanding to bear on this issue.

The GFEI believes that huge gains could be made in fuel economy which could help every country, particularly those in the developing world, to address the pressing issues of climate change, energy security and sustainable mobility. Indeed, we believe that a move across the global fleet towards far better fuel economy, at a scale which is already technically achievable, could save over 6 billion barrels of oil per year by 2050, and close to half of CO2 emissions from cars and light duty vehicles, as well as generating significant local air pollution benefits. All this can be achieved using existing, cost-effective technologies.

Based on this evidence, the GFEI has set global targets towards which we are working with partners across the world. We want to see global new car fuel consumption cut by 50% by 2030 compared to 2005 levels, with the same reduction across the whole fleet by 2050. By 2030 average new car fuel economy could be improved to close to 4 litres per 100 km (l/100km), or 60mpg, reducing CO2 emissions from 186 to 93 grams of CO2 per km on average - with all cars showing the same improvement by 2050.

Much is said by manufacturers about their focus on fuel economy, and cars are often now marketed on the basis of their fuel efficiency. Yet the data suggests thatwe are not on target. An analysis published by the GFEI late last year, shows that the global average for light duty vehicle fuel economy is currently 7.2 l/100km (32 mpg). This represents a rate of improvement of 1.8% per year from 2005 when

the average was 8.0 l/100km - far below that needed to reach the GFEI 2030 target. Average fuel economy now needs to improve globally by 3% per year, if this target is to be met. Reaching that level is ambitious but achievable: fuel economy standards already enacted around the world require annual improvements of up to 4.7%.

Shaping this data is the poor performance of non-OECD countries, whose markets are now growing much faster than their OECD counterparts. Priority should be placed in helping these countries to develop and deploy more stringent fuel economy policies.

Take Kenya, for example. Its fuel bill could reach $75 billion by 2030 with potentially devastating consequences for the country's economy. With the GFEI's support, Kenya has begun to explore steps towards cutting the cost increase by at least a quarter by 2030 and by half by 2050. The savings could be even greater if these were combined with other transport policies, such as shifting vehicles to new fuels, and curbing car travel growth through sensible transport policies. The resources saved would bring benefits for the individual motorists, and at the macro-economic level, potentially promoting economic growth, jobs, and energy security besides advantages for climate and health.

GFEI will continue to focus on making a real difference - from working with governments in developing policies to encourage improving the fuel economy of vehicles produced or sold in their countries, to supporting regional awareness initiatives that provide consumers and decision makers with the information they need to make informed choices.

Earlier this year, for example, the Chilean government, with GFEI's support, launched the first fuel economy labelling system in Latin America.Car dealers must now have a label illustrating the fuel economy standards of the vehicles on sale, making it easier for consumers to see what they are buying. We are also active in Ethiopia, Kenya, Georgia and Indonesia, and will begin work in 20 other countries in the coming year.

We want to see global new car fuel consumption cut by 50% by 2030 compared to 2005 levels, with the same reduction across the whole fleet by 2050

The GFEI is also a High Impact Opportunity under the Sustainable Energy For All initiative led jointly by the UN Secretary General and the President of the World Bank. Key reports, including from the IPCC and the IEA, have shown that the transport sector presents high potential for efficiency improvements. This potential has been reflected in concrete suggestions for new Sustainable Development Goals (SDGs) in the post 2015 sustainable development framework. The High Level Panel of Eminent Persons, for example, proposed an SDG target "to double the global rate of improvement of energy efficiency in buildings, industry, agriculture and transport." This was echoed in the recent UN Habitat report into Sustainable Urban Settlements, which concluded that "there is a need for policy interventions that encourage…increased vehicle efficiency".

It is vital that sustainable transport generally, and fuel economy more specifically, are fully integrated into global policies on sustainable development and climate change. This will help to enable effective action by national and local governments, businesses and civil society, which GFEI is already supporting. It will also ensure that Nationally Appropriate Mitigation Actions properly reflect the areas where action is needed. The momentum is there to make a step change in progress towards our 2050 targets - but only if we have a commitment to action at every level.

ALFRED OFOSU AHENKORAH
Executive Secretary, Energy Commission and Deputy Chair Renewable Energy and Energy Efficiency Partnership (REEEP)
MARTIN HILLER
Director General, REEEP

Developing Solutions

In Ghana, what might seem a minor policy intervention is tackling three problems afflicting the country. A recently introduced energy efficiency standards and labelling regime for white goods – refrigerators, deep freezers, lighting, and other household appliances – is showing results in: reducing the dumping of older, second- or third-hand goods discarded from Europe, but often sold at prices equivalent to new appliances; helping increase overall energy efficiency, alleviating pressure on electricity grids and lowering carbon emissions; and reducing electricity costs to consumers. It can thus serve as an example of how countries should approach the challenge of low carbon development over the coming decades.

Ghanaian decision makers are well aware of the dangers posed by climate change, but they also understand that their primary responsibilities to their people lie in improving well-being through economic and social development. Ensuring stable food supplies, basic health care and education, and creating economic opportunities, remain top priorities. If the threat of climate change often seems very far removed from political discussions in industrialised nations, they are even more so in developing countries.

How then can we bring development and carbon reduction efforts together? Until now, the Kyoto Protocol has represented the greatest effort to internalize the costs of greenhouse gas emissions to the global environment. That it has not (yet) worked should not cause us to despair but instead invigorate us to adjust our approach. This must not only be pragmatic and practically effective but also be conscious of history: the industrialized world paid

little heed to the environment or to climate change in its development and it is only just to expect those nations who benefited most – and contributed most to the current stock of greenhouse gases in the atmosphere – to bear a greater share of the effort.

Europeans in particular might understand the need for development as they look back to the ruins left by the Second World War, and to the effort and urgency to rebuild after it. Accepting the need for rapid improvements in human well-being in developing countries is a critical step towards establishing a fair and successful global carbon regime.

Of the United Nations' great initiatives, the Millennium Development Goals stands out - not because every goal will be met or every objective reached, but because they are succeeding in focusing at least a part of the global agenda on the needs of the poorer half of the world's population. Now, the United Nations is conceiving the next set of 15-year targets: the Sustainable Development Goals (SDGs). We hope that negotiators will see the need for rapid economic and social development and incorporate access to sustainable energy as a key pillar in their formulation, using the UN's own Sustainable Energy For All Initiative as guidance. This could not only serve to make existing aid programs more sustainable but also benefit the UN climate negotiations.

The SDGs offer an opportunity to look at the question of energy access from a different angle: seeing energy – and clean, renewable energy – not as an end in itself, but as a key enabler for nearly all the necessary services upon which a developed and fair society. We must focus on modern energy services.

Energy plays a critical role in support of nearly all other development goals, from public health and health care to education, from women's rights to food security.


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The Ghana Energy Commission and the Renewable Energy & Energy Efficiency Partnership (REEEP) are currently developing a new approach to this last issue, at what is known as the food-energy nexus. We intend to focus on value chains in agriculture and farming, such as for cocoa and coffee production, working with clean energy entrepreneurs who can offer specific energy solutions for individual steps in the chain. This might include using solar water pumps, solar cooling storage, process heaters, biomass heaters or generators, or various other technologies. But the solution will always be specific to the needs of the people, and to the available resources. The need must dictate the role and method of energy production.

Our goal is not simply to promote clean energy but also to identify new business models that solve specific problems, support entrepreneurs in their development by attracting private investment, and apply real-world lessons to policy and regulatory adjustments so as to further incentivise development. The Ghana Energy Commission, as energy policy advisor and regulator, is ideally placed to do this work. Monitoring and evaluating actual business cases in the market will inform the specifics of policy making: regulatory or tax incentives for specific energy sources, managing barriers to entry, larger-scale public policy mechanisms, and financing support for scaling-up existing projects and initiatives.

As clean, green, low carbon development takes hold it will begin to grow on its own, helping developing countries to industrialize and feeding data and technological innovation back into developed economies to promote novel and better ideas for products and services

The UN Framework Convention on Climate Change could help similar schemes by putting low carbon development at the centre of its focus. The Nationally Appropriate Mitigation Actions (NAMAs) are an important step in the right direction. The hotly contested area of MRV – Measure, Report, Verify – might take on a more constructive image: rather than a controlling device between countries it could become a critical data delivery mechanism for one's own country and economy. The Green Climate Fund could focus on energy solutions related to the SDGs. Promising technology initiatives such as the Climate Technology Centre and Network are already gearing up to support precisely such processes.

As clean, green, low carbon development takes hold it will begin to grow on its own, helping developing countries to industrialize and feeding data and technological innovation back into developed economies to promote novel and better ideas for products and services. And Ghana might become a leading producer of energy efficient white goods in West Africa.

BIANCA JAGGER
Chair, **BIANCA JAGGER**
Human Rights Foundation

Gaining ground

Land restoration is at the heart of the solution to climate change: it will play a vital role in both mitigation and adaptation.

The Stern Review on the Economics of Climate Change recognised that "curbing deforestation is a highly cost-effective way of reducing greenhouse gas emissions." Deforestation constitutes nearly 20 per cent of overall emissions, and is accelerating climate change. The world's forests store 289 gigatonnes of carbon in their biomass alone, and can be used as a tool to mitigate climate change.

Cultivatable land, moreover, is becoming scarcer. It will continue to do so in the years to come, if climate change is allowed to accelerate. As temperatures climb it may become as scarce and as prized as oil. We must steward the land we have and restore what has been deforested and degraded land to purpose.

The Global Partnership on Forest Landscape Restoration has mapped 2 billion hectares of deforested and degraded land across the globe - an area the size of South America - with potential for restoration. This is not simply about planting trees. People and communities are at the heart of the restoration effort, which transforms barren or degraded areas of land into healthy, fertile working landscapes. Restored land can be put to a mosaic of uses such as agriculture, protected wildlife reserves, ecological corridors, regenerated forests, managed plantations, agroforestry systems and river or lakeside plantings to protect waterways.

Restoration can help lift millions of people out of poverty and inject more than US$80 billion per annum into local and global economies while reducing the 'gap' between the carbon emissions reductions governments have promised and what is needed to avoid dangerous climate change by 11 to 17 per cent. We will see the benefits not only in our lifetime, but in years to come.

Damage to our forests and ecosystems, on the other hand, could reduce global GDP by

about 7 per cent and halve living standards for the world's poorest communities by 2050. Forests, after all, sustain our most basic needs. They are vital for clean air, food, three-quarters of the world's fresh water, shelter, health and economic development. 1.6 billion people, almost a quarter of the world's population - depend on them for their livelihoods.

It is no coincidence that more than 75 per cent of the world's conflicts occur in dryland areas - home to only 35 per cent of the world's population. Climate change is stretching our already overstretched resources – water, energy, land - to their breaking points.

In May 2012, I became Ambassador to the International Union for the Conservation of Nature (IUCN) Plant a Pledge campaign, to support the Bonn Challenge target of restoring 150 million hectares of degraded and deforested land by 2020. The largest restoration initiative the world has ever seen, it has the potential to sequester approximately one gigatonne of carbon dioxide per year.

We launched Plant a Pledge at Rio+20 in June 2012, where we announced landmark restoration commitments totalling 18 million hectares. The United States Department of Agriculture Forest Service pledged 15 million hectares, the government of Rwanda two million hectares, and the Mata Atlantica Forest Restoration Pact of Brazil, a coalition of government agencies, NGOs and private sector partners a million hectares.

Since then El Salvador and Costa Rica have pledged one million hectares each, bringing us to 20 million hectares. BMS Rathore, India's Joint Secretary, Ministry of Environment and Forests, indicated India's commitment to the Bonn Challenge, in a pre-pledge of 10 million hectares. And the Meso-American Alliance of Peoples and Forests has indicated their interest in pledging 20 million hectares. We look forward to them formalising their commitments.


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The number of restoration pledges has surpassed all expectations. But we still need to persuade governments and others who own or manage land around the world to achieve the Bonn Challenge goal by 2020.

The government of Rwanda has made the historic decision to restore all its forests by 2035. It is starting in Gishwati, whose forests were badly degraded even before the civil war made things worse. Between the 1970's and 1994 they were reduced from over 21,000 to 700 hectares. So much soil was washed into rivers that nearby Lake Karago, choked with sediment, has halved in size.

The journey will be long, and arduous – but the first green shoots of restoration are already visible. The emphasis is on agroforestry – planting trees in fields – using species that are valuable to local people, as timber or as fodder for their livestock. Terraced fields are being created to help hold the soil in place. Women's groups are cultivating bamboo, which provides good soil cover and can provide fuel or furniture for extra income. If the NGOs, local communities and Rwandan government continue to collaborate, and don't give up, Gishwati could be healed.

In Brazil the Instituto Terra de Preservacio Ambiental has, over the last six years, restored and reforested over 190, 000 sq ha of land outside Rio, where the Atlantic Forest has been devastated by centuries of exploitation and deforestation. It has created a biodiversity corridor which preserves the quality and quantity of the city's water resources, balances the microclimate, helps biodiversity and curbs soil erosion.

Restoring and preserving the land is more than a socio-economic or environmental issue – it is critical to our survival. The most basic human rights, the rights to life, food, health and water to name a few - are directly connected to the land.

If we are to preserve life on earth for future generations we must take action now. We cannot sit back and wait for world leaders to act. Restoration of deforested and degraded land is hard work, can take years, requires collaboration between governments, NGO's landowners, individuals. But it is the solution to the approaching land scarcity, climate, water and energy crises.

Our fate, and that of future generations, depends on it.

Meso-American Alliance of Peoples and Forests has indicated their interest in pledging

20 million

hectares. We look forward to them formalising their commitments.

Marcus Brigstocke

He has probably done more than anyone to employ humour to bring home the reality of climate change, but Marcus Brigstocke, the British comedian, says he wishes he had never become interested in the topic in the first place. What he has learned about it, he told Our Planet, "has depressed me beyond measure" and "caused me nothing but distress and unhappiness".

Image Courtesy of: http://lincolncomedyfestival.co.uk

The stand-up comic, who appears regularly on British radio and television - and who had a cameo role in the hit film Love Actually - has been dubbed ' the climate comedian' for his groundbreaking work in trying to turn up the public and political heat on global warming. But he fell into it "by mistake." He'd "read some stuff and seen some coverage" and then happened to watch an early, and now discredited, documentary, denying the science. " I asked some scientists and did some research and began to wonder why an increasingly vocal group were suggesting that most climate scientists, governments and environmentalists were lying and building a conspiracy. This idea of a giant hoax in the name of a secret socialist agenda or some sort of eco-fascist takeover or a crippling assault on developing nations or a nefarious fund raiser for new energy producers and loft insulation firms seemed then like a load of implausible bollocks, and it still does today".

His research took him twice to the Arctic to work with climate scientists and oceanographers. He found the first trip "horrific"' with the conditions frightening, and information he gleaned even more so. "I was not ready for this" he says. "I spent the year convinced that if the world wasn't changing then if must be because I wasn't shouting loud enough.

"By the time I returned to sail up the west coast of Greenland a year later, I had worked some of it out and the trip was fascinating, particularly when talking to Inuit people. Their version of events is mostly clear of the politics and posturing in which we get bogged down".

"I eat local and seasonal wherever possible. I installed solar. I drive a hybrid. I offset flights. I often holiday in a solar powered motor home. I have spent a good deal of my earnings on insulation and new windows for my house. I compost and I recycle. I avoid food waste whenever I can"

Brigstocke - who began his career while still at university, and quickly won the BBC's New Comedian award in 1996 - adds: "At my best, I have been able to discuss climate change in a funny way and therefore somewhat remind people of the issues and possible solutions to them. At my worst I am probably too ranty and unhelpful. No doubt this is linked to my own guilt about the hypocrisy of my own lifestyle - you'd have to ask my therapist (I don't have one). I've spent too much time arguing with people who'd positions on this topic will never be swayed by evidence. That is a spectacular waste of energy."

Not that he has not made changes in his life. "I eat local and seasonal wherever possible. I installed solar. I drive a hybrid. I offset flights. I often holiday in a solar powered motor home. I have spent a good deal of my earnings on insulation and new windows for my house. I compost and I recycle. I avoid food waste whenever I can (easy....I'm greedy). I switch lights and appliances off when I'm not using them. I consider the energy use of things I buy, and go for the low option.

"However - the truth is that I find most of that pretty easy. I still fly and I buy too much stuff. I eat too much and blah, blah, blah. My critics love it and trawl the web to find evidence that I'm a hypocrite. They are not wrong. I do what I feel able to do for now, and I expect governments and businesses to do more."

He says he does not hold out much hope for negotiations on a new climate agreement at present ("the will is not there") but adds: "In the long term I am somewhat optimistic that change, mitigation and adaptation will happen"

Part of the problem is that we are "surprisingly myopic" in our approach to what we use. "If you can see the rubbish you produce you deal with it, but once we can no longer see it we mostly consider that it is none of our business. Greenhouse gases are invisible, so they don't really exist for most of us. If CO2 were bright yellow or stripy, the world would be a very different place."

United Nations Environment Programme

VALUE FOR MONEY

EFFICIENT AND EFFECTIVE

- UNEP's overhead costs cut from 8.5 per cent (2006-2007) to 7.7 per cent (2014-2015)
- Staff productivity: ratio of staff to funds invested improving from 2.4/ US$1 million (2012-2013) to 1.8/ 1 US$ million (2014-2015)
- Since 2008 member states have increased their voluntary contributions to UNEP by 52 per cent
- 100 per cent of UNEP member states rated UNEP effective in keeping the world environmental situation under review (source: UN Office of Internal Oversight Services – OIOS, Progamme Evaluation of UNEP 2013)
- 88 per cent of UNEP member states rated UNEP effective in providing policy advice on environmental issues based on sound science assessment (source: UN OIOS, as above)
- MOPAN, an informal network of 16 donor nations, concluded that UNEP has made considerable progress in becoming a more results-oriented organization. (MOPAN assessment of UNEP 2011)

The Montreal Protocol/ Multilateral Fund has cut ozone depleting substances by

98%

– over 20 million skin cancer and 130 million eye cataract cases prevented; trillions of dollars in reduced health care costs, climate benefits equal to 135 Gigatonnes of CO_2.

http://ozone.unep.org/new_site/en/montreal_protocol.php and
http://www.multilateralfund.org/default.aspx

Poverty - Environment Initiative (PEI)
This joint UNDP-UNEP initiative has assisted nearly

30 Countries

since 2008 incorporating targeted investments in national development plans and budgets. 50 countries expressing interest to participate in a new five year phase launched in 2013.

http://www.unpei.org/

Fast Climate Action - UNEP has over

10 years

built the scientific case for fast action on short-lived climate pollutants. Climate and Clean Air Coalition launched in February 2012: now a multi-million dollar initiative with over 60 country and non-country members.

http://www.unep.org/ccac/

Global Environment Outlook-5
GEO reports are UNEP's most authoritative assessment on the state of the planet which in 2012 informed Rio+20 negotiations: over 5,000 articles and

280,000

visits to GEO-5's web site in the month of June 2012 with spin-off reports for cities, youth and business.

http://www.unep.org/GEO/geo5.asp

UNEP-led Partnership for Clean Fuels and Vehicles finalized the near global elimination of lead in fuel– a phase-out worth

$2.4 trillion

in reduced premature deaths, heart disease and brain damage in up to 18 million children. Phasing-down sulphur in fuels now underway.

http://www.unep.org/transport/pcfv/

UNEP's **Global Green New Deal** helped focus $460 billion of an estimated

$3 trillion

of stimulus packages on green investments, and saw UNEP's Green Economy report and initiative become a major theme in the Rio+20 summit. UNEP has since worked with 25 countries on a Green Economy transition. Partnership for Action on Green Economy launched in 2013 with 30 developing countries requesting support.

http://www.unep.org/greeneconomy/ and
http://www.unep.org/pdf/G20_policy_brief_Final.pdf

New International Mandates for UNEP in 2012 – Member states selected UNEP to host Secretariats for

- International Science-policy Platform on Biodiversity and Ecosystem Services (IPBES)
- 10 Year Framework of Programmes for Sustainable Consumption and Production (Rio+20 Summit)
- Climate Technology Centre Network (UNFCCC Conference of Parties).

www.unep.org/climatechange/ctcn/

Funding Support for UNEP Broadens with a first-time pledge of $6 million from Brazil and $6 million from China at the

Rio+20

Summit, while the Russian Federation's contribution has tripled in the past two years.