UNEP

Our planet

THE MAGAZINE OF THE UNITED NATIONS ENVIRONMENT PROGRAMME
APRIL 2014

GREENING BUSINESS

GREEN GROWTH
JORGE MOREIRA DA SILVA

CRUCIAL YEAR
CHRISTIANA FIGUERES

FROM CAVES TO MEGACITIES
FRANS VAN HOUTEN

TROUBLE IN STORE
ZOLA TSOTSI

Our Planet,
the magazine of the United Nations Environment Programme (UNEP)

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To view current and past issues of this publication online, please visit www.unep.org/ourplanet

ISSN 1013 - 7394

Director of Publication: Naysan Sahba
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Design and Layout: Amina Darani, William Orlale
Produced by: United Nations Environment Programme

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

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Reflections

Greening business – and the business of greening – is essential to the global transformation to an inclusive, resource efficient and low-carbon economy. There has been significant progress in the last two decades. Many private sector companies, as this edition of *Our Planet* shows, are now partners for change. They are critical actors for meeting today's environmental challenges and are seeing the benefit of creating decent jobs in a green economy.

But we have to go much further, as a world community, and make the very transition to a green economy a mainstream business proposition. It has to become more than a necessity, a cost, a challenge – and be seen as a massive opportunity for the badly needed transformative change. The partnerships between public and private sectors have to be taken much further to enable the far-reaching restructuring of our economies that is required. And we have to involve investors and financial markets and bring into play many billions of dollars which are largely beyond the means of public budgets.

The transition towards a green economy has put a focus on something that more and more businesses are already looking at in terms of their strategic outlook, markets, supply chains, and customer or consumer preferences. Assessments and reports on the future of resource flows and resource constraints in the global economy, for example, are registering on the radar of many a corporate planner or investor who is trying to work out where future raw material will come from, and how markets will evolve.

Similarly, companies are increasingly focusing on how the transition towards a low-carbon economy, or the emergence of renewable energy technologies, could quickly change the fundamental economics of their investments – suddenly, for example, making redundant a fossil fuel power station in which billions of dollars have been invested. Businesses – particularly those on the stock market – will increasingly be faced with investors who will want to know whether a company is likely to end up holding a series of 'stranded assets'.

More and more companies are today engaging with UNEP in such areas as climate change and resource efficiency, finance, energy efficiency or through the International Resources Panel, which examines the future availability of resources such as minerals and metals or their reuse and recycling.

But the key is to try to enable business to become an integral part of the solution, through seeing how an interplay between public policy, markets and entrepreneurial capacity can induce innovation and bring new opportunities to the market to produce more resource-efficient industries or more low-carbon energy and electricity. If, for example, Governments begin to regulate for greater energy efficiency through adequate public procurement policy, markets will suddenly open up for products, services and advice that help to achieve it.

Clearly businesses face significant challenges. They need to have confidence that the future really will be different while 'making good business sense', requiring them to invest in change, if they are to manage profitability or returns to shareholders for the long-term. They also need to have confidence in their own entrepreneurial and innovatory potential, because if they cannot come up with new technological solutions, products or services they will conclude that they have no chance of prospering in the transformation.

Above all, public policies must become more predictable and transparent to create incentives for businesses to enter the transformational process, including through how externalities are priced. If a polluter does not have to include the cost of its pollution into the price of its product, then those made by cleaner producers will be more expensive – never a great business proposition in a competitive market. Thus it is essential to include the life-cycle costs of products or services in the way they are priced – not least because it avoids penalising consumers who opt for "greener" choices.

Targeted subsidies can provide a vehicle to scale up and accelerate the introduction of new technologies, thereby lowering the risk threshold for business in the initial phase of developing them – but it is also necessary to know how subsequently to reduce them in a rational and predictable manner. And fiscal incentives need to be devised that will essentially open up whole new markets for cleaner products and more sustainably produced goods, allowing new entrants into the market and enabling existing participants to change.

Given what we know is happening to our planet, there is an imperative to achieve transformation through decoupling economic growth from increasing resource use and environmental impacts. The greening of business and the business of greening can do much to bring it about.

Green Growth

JORGE MOREIRA DA SILVA
Minister for Environment, Spatial Planning and Energy, Portugal

Portugal has experienced a severe economic crisis in recent years. In May 2014, the programme of economic and financial assistance established with the International Monetary Fund, European Commission and European Central Bank came to an end. After almost three years of the agreement with this Troika, Portugal has enhanced its international credibility, returned progressively to the market for its financing needs and achieved very positive results in terms of financial stabilization and the consolidation of its public finances.

While this was one of the most difficult periods the Portuguese people have ever had to face, with families and companies being asked to bear many sacrifices, it was also a time to reflect on our future destiny as a country and as a people. There was a need to choose priorities. Green growth emerged as one of these, mobilizing the government, business, organizations and citizens. Continuous exploitation of natural resources is severely impacting the environment, people's daily lives and the global economy. We are depleting natural resources at an outstanding pace and we seem to forget that they are the major input of any economy.

*"Portugal decided that **the future we want should be greener,** and that we should start making the transition towards a low-carbon economy."*

Aware of this fact, Portugal decided that the future we want should be greener, and that we should start making the transition towards a low-carbon economy to achieve that goal.

Portugal is fully committed to meeting its climate change challenges, both now, in the run up to 2020, and

beyond. Portugal is in compliance with the targets set for 2008-2012 under the Kyoto Protocol commitments. Indeed, recent data on emissions confirm a downward trend since 2005, which indicates that Portugal had started a process of decoupling economic growth and greenhouse gas emissions before the economic and financial crisis began, mainly due to large investments in renewables and improvements in the energy efficiency of industrial processes.

At the same time, our natural characteristics give us – as well as great biological diversity – great potential in renewable energy resources, specifically hydro, wind and solar energies. In 2013, over 57 per cent of electricity consumption was generated by them, and Portugal is fully committed to continuing its renewable growth path. Within its new Renewable Energy Strategic Plan (PNAER), Portugal is targeting around 5GW of new renewable energy capacity by 2020.

Meanwhile our new Energy Efficiency Strategic Plan (PNAEE), paired with PNAER, targets a 25 per cent primary energy reduction by 2020. It aims to boost energy efficiency within the economy, mainly within the public sector (which has to reduce by 30 per cent) through a structural reduction of public spending and efficient use of resources.

And Portugal can also be proud of major progress achieved in the water and waste sectors over the last two decades, where very impressive results have been obtained with direct consequences on public health.

For all these reasons, we believe that we have the necessary conditions for choosing green growth and sustainability as the basis for our common future.

We want to evolve towards a more resilient, competitive and sustainable economy, as we are firmly convinced that this will provide the necessary basis for tackling the most relevant and demanding global challenges – the needs to fight climate change, satisfy our energy requirements and promote our economies competitiveness.

*"We are developing a **green fiscal reform**, based on the principle of fiscal neutrality – making sure that the impact on the tax payer remains the same by reducing taxes on labour in the same proportion as we increase carbon, property and other environmental taxes."*

If the challenges are global, the responses must also be achieved internationally. So Portugal believes that reaching a new global climate agreement by 2015 is crucial if we are to keep global warming below 2 degrees. Securing an effective, ambitious, fair and legally binding agreement will require enhanced ambition by all Parties, and need transformational change towards a more sustainable and less fossil fuel dependent society.

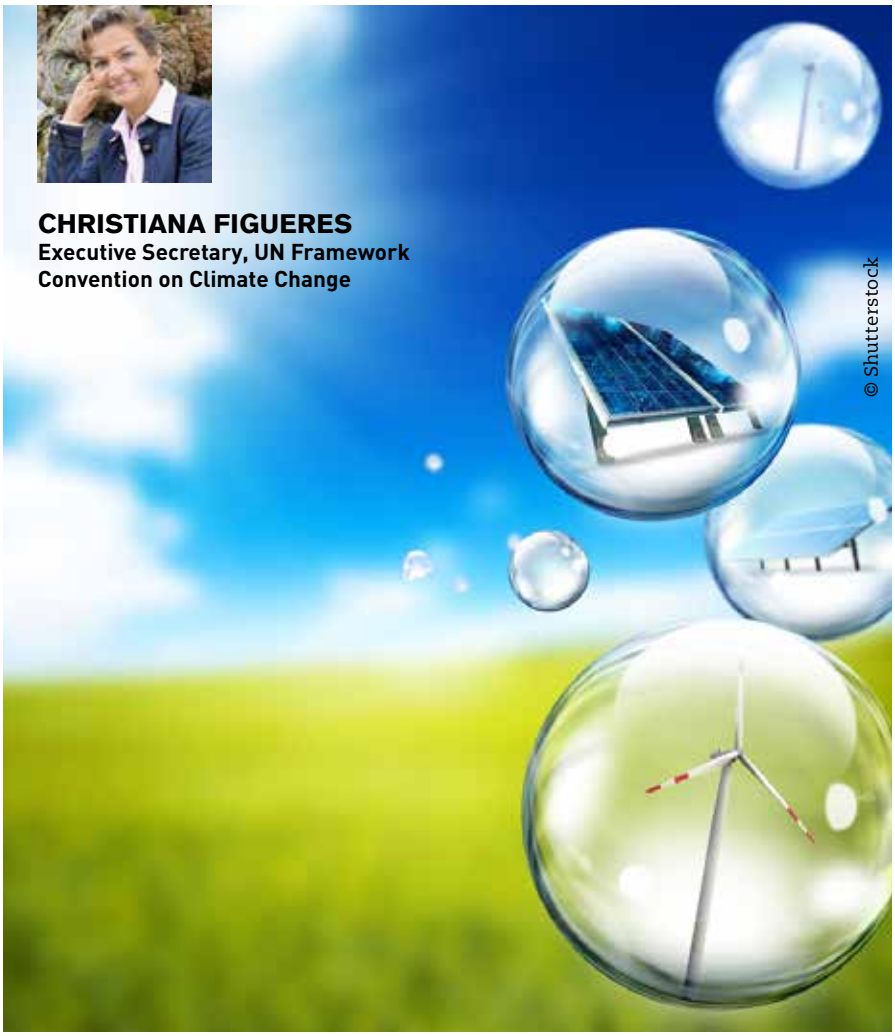
At the European level, where we are now discussing the 2030 framework for climate and energy policies, Portugal has been defending a group of targets that we consider will contribute decisively to raising this ambition – a greenhouse gas emissions reduction target of 40 per cent, an energy efficiency target of 30 per cent, a renewable energy target of 40 per cent and a grid interconnection capacity target of 25 per cent.

We fully believe that a clear set of targets coming from the European Union will provide necessary clarity and ambition to be communicated to the rest of the world. The sooner we provide such clarity, the sooner we will set the tone for the coming international negotiations.

So for Portugal it is not a matter of when or how to promote growth, competitiveness and job creation in a resource-efficient way. It is about acting now, because that is the most sensible economic model that any country can adopt.

We have already in place a set of measures and reforms that we consider will make a difference in the years to come. For example, we are developing a green fiscal reform, based on the principle of fiscal neutrality - making sure that the impact on the tax payer remains the same by reducing taxes on labour in the same proportion as we increase carbon, property and other environmental taxes.

We are also very confident about the opportunity raised by the forthcoming European Structural and Investments Funds for 2014-2020, by mainstreaming 20 per cent of the Multiannual Financial Framework for climate action.



CHRISTIANA FIGUERES
Executive Secretary, UN Framework Convention on Climate Change

Crucial Year

2014 is climate change's year of ambition: it needs to be.

Greenhouse gases in the atmosphere are at their highest level for 800,000 years and have continued to rise at an average of about 2.7 per cent annually over the past decade. The world needs to end this curve dramatically, putting seven billion – rising to over nine billion – people on a new and transformational trajectory.

This must match their needs with those of the planet and the scientific reality being outlined this year in ever more sobering and precise detail, not least in the fifth assessment report of the Intergovernmental Panel on Climate Change (IPCC) hosted, as it is, by UNEP and the World Meteorological Organization.

Yet this is a year not just of sobering science or dark reflection, but of extraordinary momentum. True the sums do not currently add up to keeping a global temperature rise under 2 degrees C this century. But many governments are demonstrating new levels of ambition which, if scaled-up and accelerated, could build the first bridge towards a safer, healthier and more prosperous future for all. A very few examples are:

- Morocco has recently announced a renewables target of **42 per cent by 2020** with an estimated $9 billion for solar projects alone
- The European Union has proposed **40 per cent** emissions reduction and 27 per cent renewable targets for 2030
- Construction has just started on what is believed to be Latin America's biggest solar power plant –**a 30MW project** at La Paz, Mexico
- Last year China, now the world leader in wind power, installed a record **12 Giggawatts of solar panel**: a further 14 GW is expected this year
- Jamaica plans to generate **20 per cent of electricity** from renewables by 2030

Many of the clean energy projects – including Jamaica's 21 MW Wigton Wind Farm – have been supported by the Clean Development Mechanism (CDM) of the Kyoto Protocol. Indeed half the renewable energy investment in developing countries in 2011 was linked to CDM projects.

Meanwhile, the national legislation needed to build and support a new universal agreement by the Paris UN climate convention meeting in late 2015 is also growing.

A recent study analyzed 66 key countries and found that 61 have passed climate and clean energy laws. There are now around 500 such laws world-wide compared to 40 just ten years ago.

There is also a new groundswell of action by cities, companies and the finance sector. Cities, producing over 70 per cent of human-generated greenhouse gas emissions, have doubled their climate action since 2011 to some 8,000 activities ranging from clean energy to bus rapid transport systems.

Former New York Mayor Michael Bloomberg was this year asked by the UN Secretary-General Ban ki-moon to be his Special Envoy for Cities and Climate Change. Unleashing cities' potential to fully deliver on cutting greenhouse gases is a key challenge, and opportunity, in the run up to Paris 2015.

Many corporations are also stepping up. The World Business Council for Sustainable Development's Action 2020 programme, for example, will shortly deliver a suite of scalable business solutions to climate and development challenges.

More and more companies see profits in higher levels of efficiency. A UK Carbon Trust analysis of energy efficiency measures in over 2,000 organizations showed an average internal rate of return of over 40 per cent – compared with 10-15 per cent returns from 'typical' business investments.

Inaction brings risks to supply chains. Paul Polman, CEO of Unilever notes how, after drought, "a beef processing plant in Texas shut down last year, because there just wasn't enough water in the region to keep the cattle industry alive: 2,300 jobs or 10 per cent of the town's population and $55 million in payroll were eliminated in a stroke".

Investors, including pension funds, also see the writing on the wall, since – if the world is to stay beneath the internationally-agreed temperature rise of two degrees – only 20 per cent of known fossil fuel reserves can be burned unabated. Some European and US pension funds are already divesting themselves of fossil fuel investments. Some like Pension Denmark are investing the proceeds in renewable energies in developed and developing countries – and getting greater rates of return.

We need more vision from them – and more supportive, long term policy setting by governments – not least to reach an annual investment of $1 trillion, the amount most experts agree is needed to catalyze a transition to a low-carbon, resilient global economy which also boosts access to energy in developing countries.

*"Cities, producing over **70 per cent of human-generated greenhouse gas emissions**, have doubled their climate action since 2011 to some 8,000 activities ranging from clean energy to bus rapid transport systems."*

So the signals for a universal new agreement in Paris are encouraging. Over the coming months and into next year, nations need to raise their 'pre 2020' ambition in advance of a new agreement coming. By mid-century the world needs to not only reduce its emissions but achieve what experts call net zero emissions.

There will be many milestones and litmus tests over the coming months and many opportunities where nations and others can raise the necessary ambition. The June meeting of the UNFCCC in Bonn is one; another is the UN Secretary General's Climate Change Summit in New York in September.

A robust draft agreement, one which captures the collective ambition of nations to reduce emissions and assist the vulnerable to adapt, needs to be on the table for the Conference of the Parties in Lima in December. It must also be clear on how those reductions will be verified and reported in ways that engender a universal sense of confidence and cooperation in effectively bending the curve of global greenhouse gas emissions.

Meanwhile the Green Climate Fund, designed as a central financial delivery system to assist developing countries, needs serious and significant amounts of funding: again this is about confidence building.

Climate summits have all too often fallen short of ambition, partly perhaps because some felt they were being asked to make too great a sacrifice. But the proposition is now different: it is inaction that brings the sacrifice – and not just of a healthy, functioning atmosphere. For in tackling climate change, society can also address many of the world's sustainability challenges, from air pollution and ill health, to clearance of forests and loss of biodiversity, and lack of access to electricity and energy poverty.

That makes agreement in Paris a good deal for the planet, and for people everywhere.

Numbers

Spending on exploration and development of new fossil fuel reserves by the 200 largest listed fossil fuel companies totaled **US$ 674 billion** in 2012, almost three times the global investment in renewable for the same year. — ZADEK

Greenhouse gases in the atmosphere are at their highest level for **800,000 years** and have continued to rise at an average of about **2.7 per cent annually** over the past decade.

Urbanization means that by 2050 some two-thirds of the global population will live in cities, compared to half today. Cities account for **70 per cent** of the world's total carbon footprint. — **UNEP**

Approximately **4.3 million people** a year die prematurely from illness attributable to household air pollution caused by the inefficient use of solid fuels.

Over half of the deaths from acute lower respiratory infections among children less than five years old are due to air pollution from household solid fuels. In addition, **3.7 million deaths** can be attributed to outdoor air pollution of which transport, energy production and industry are major sources. — UNEP

Wind-power installations will climb to a record this year, driven by resurgent U.S. demand and growth in developing nations from Brazil to China, the Global Wind Energy Council predicted. Worldwide **installations** will probably surge 34 per cent to **47.3 gigawatts** in 2014, the Brussels-based trade group reported.

Diarrhoeal diseases cause over **four per cent** of the **global disease burden**, 90 per cent of these cases are linked to environmental pollution and lack of access to safe drinking water and sanitation. Diarrhoeal disease, although preventable and treatable, is the second leading cause of death in children under five, with nearly **1.7 billion cases** and **760,000 deaths annually**. — UNEP

Ecosystem degradation has multiple detrimental effects on human health, including on food security and resulting malnutrition. A recent survey by the International Soil Reference and Information Centre (ISRIC) found that almost one-fifth of cropland is degraded resulting in lower food production and approximately **1.5 billion people** depend directly on these degraded areas. Today, 842 million people are **undernourished**, the vast majority (827 million) in developing countries. About **45 per cent** of all **child deaths** are linked to **malnutrition**. — **UNEP**

The UN Millennium Ecosystem Assessment – a **four-year appraisal** of the Earth's ecosystems completed in 2005 – found that 60 per cent of the world's key ecosystem services have been **degraded over the past 50 years** due to, for example, land use change, resource over exploitation, pollution, invasive species and climate change. Many of the world's ecosystems are in decline, and this poses significant challenges to business.

WWW

Africa Turns Green a charity, which showcases the work of African green entrepreneurs who are protecting their environment
http://www.africaturnsgreen.org/web

Advantage Environment highlights a number of existing, new and future products and services which will reduce the impact on the environment, compared with a scenario in which old technology continues to be used. We call this Advantage Environment.
http://advantage-environment.com/

World Business Council for Sustainable Development
The World Business Council for Sustainable Development is a CEO-led, global association of some 200 international companies dealing exclusively with business and sustainable development. Founded: 1995
www.wbcsd.org

The World Green Building Council is a network of national green building councils in more than one hundred countries, making it the world's largest international organisation influencing the green building marketplace.
www.worldgbc.org/worldgbc/about
www.unfccc.int

Intergovernmental Platform on Biodiversity and Ecosystems services.
www.ipbes.net

Climate and Clean Air Coalition; all the information you need to know about trying to end pollution.
www.unep.org/ccac

Green Enterprise Movement – Advise for helping businesses go green
http://greenenterprise.ca

FRANS VAN HOUTEN
CEO, Royal Philips

From caves to megacities

The invention of the electric light bulb in the 19th Century – like the controlled use of fire by cavemen, hundreds of thousands of years ago – marked a turning point in the evolution of mankind. Availability of light transformed social and economic life and paved the way for greater prosperity. Now, we are on the cusp of a new lighting revolution, involving connected technologies and new business models and partnerships. Philips believes that these changes will create cities and communities that are safer, more vibrant, productive and energy efficient.

From Karachi to Lagos, from Shenzen to Jakarta, cities are in the midst of a major transformation. Urbanization means that by 2050 some two-thirds of the global population will live in cities, compared to half today. Our challenge is to build cities that enable people to live safe, healthy and productive lives. Access to energy and to light plays a key role in this. And considering that lighting accounts for 19 per cent of the world's electricity consumption, there is an additional need for environmentally and financially sustainable solutions.

Philips feels called upon to contribute to them.

More than 120 years ago, brothers Anton and Gerard Philips established the company as a leading producer of incandescent light bulbs. In recent years, the shift from incandescent to LED has been as rapid and profound as the shift from dial-up to broadband internet services. Lighting is now moving beyond mere illumination into a fully digital world in which it connects people, places and devices – ultimately making cities better places to live and work in.

By connecting LED lights to smart controls, networks, devices and apps, we can empower people in new ways: enabling them to control their lighting intelligently so as to create customized experiences and drive new business outcomes, while being frugal with energy.

Our Hue lighting system, for example involves LEDs whose color and intensity can be wirelessly adjusted with an app, giving people a new degree of freedom as to how and when they create light in their homes. Also the lighting can interface with internet services – flashing a particular colour, for example, when you receive an email from your boss! We have also worked with Deloitte

"Our challenge is ***to build cities*** *that enable people to live safe, healthy and productive lives. Access to energy and to light plays a key role in this."*

to create a cutting-edge, connected lighting system in its new Amsterdam office. The luminaires have been fitted with sensors and transmitters which give office employees the freedom individually to adjust lighting above their workplace. At the same time, property managers receive real-time intelligence about the lighting and energy usage in the building, helping to lower energy consumption, reduce C02 emissions and maintenance costs, and provide office workers with a more comfortable and productive working environment.

We are applying a similar approach to cities. Our CityTouch system empowers municipalities to manage an entire city's lighting systems from a single online interface, providing real-time status reports on individual light points and allowing light to be adjusted to weather, traffic and crowd conditions. This reduces carbon emissions and light pollution, and – combined with LEDs and controls – results in up to 70 per cent savings in energy and maintenance costs compared to traditional lighting. The system can easily be expanded with new functionalities, streets and technologies, thereby protecting the city's investments.

We have also partnered with Ericsson to integrate their mobile cellular technology into light posts equipped with LEDs, allowing cities to roll out a high-performance mobile network in dense urban areas while generating public light with energy-efficient LED technology. This is complemented by a novel business model where lighting is provided as a service. While it can be structured in different ways, Philips typically makes the initial investment in the infrastructure, which cities then repay from their energy savings. Alternatively, a city can invest in the smart poles and rent the space out to mobile operators.

Either way, these models mark a shift from choosing the lowest initial costs to investing based on life-cycle value: this could significantly speed up the adoption of novel lighting technologies, thereby generating considerable energy savings.

Unfortunately, the speed of adoption does not yet match urbanization's breakneck pace. Developed nations are stuck with legacy investments in lighting technology which is rapidly becoming outdated. Ironically, emerging economies – which sometimes lack proper lighting infrastructures – can leapfrog these constraints and immediately adopt the latest and best solutions. In cities like Buenos Aires and Dubai, municipalities have been able to roll out next-generation lighting to millions of people.

These successes are the result of close co-operation between the private and public sector. The private sector should invest in innovation, and develop technologies and business models that add value to cities. In turn, governments should develop policies that stimulate innovation and adopt more ambitious energy efficiency standards. They should also lead by example and ensure that public buildings and lighting are energy efficient and smart. The Dutch port city of Rotterdam, for example, was the first in the world to adopt CityTouch in its streets, showing leadership and vision that others could emulate.

There is a world of difference between cavemen at the dawn of civilization and today's megacities that are home to millions of people. What hasn't changed is our human need for safety, belonging, wellbeing and progressive work. Our hope is that better access to light, and energy, will empower these people to live the way they want and deserve. For us, the future of light is connected.

ZOLA TSOTSI
Chairman, Eskom, South Africa

Troubles in store

Eskom emits over 225 million tons of carbon dioxide (CO_2) a year, making it one of the world's largest producers of greenhouse gas. This is the result of 90 years of South Africa's reliance on abundant coal reserves, but – in line with the global imperative to manage down CO_2 emissions from all sources – we are committed to reducing them from our electricity generating processes in line with our corporate value of zero harm. Shrinking our environmental footprint and pursuing low-carbon growth opportunities is a pillar of our strategic intent.

Carbon Capture and Storage (CCS) is one of the technology options being researched by Eskom as a possible solution to the CO_2 problem. It forms part of a suite of them including nuclear, renewables, hydropower imports, and energy efficiency – as well as cleaner, more efficient fossil fuel options such as gas and high efficiency coal.

We see the technology challenges behind CCS as less than the social and economic ones surrounding implementation in South Africa. The technology solutions are not simple, but the complexities of providing affordable access to clean electricity in a developing country are far more challenging. We are confident that our research efforts and our extensive partnership network provide sufficient knowledge and expertise to enable technical solutions to be engineered. Boardroom discussions will be dominated by their impact in a country with high unemployment, large disparities between rich and poor, and an economy that is not resilient to energy price increases.

Five key questions must be answered convincingly before significant investment decisions can be made in large scale plants in South Africa.

Where to store the CO_2? The South African Centre for Carbon Capture and Storage (SACCCS) has released an Atlas which, though based on limited data from geological surveys, paints a pretty grim picture of the potential for onshore storage close to point sources. The country's geology seems not to be very storage friendly. There appear to be some opportunities offshore, but the cost and complexity of drilling, injection, and transport rise significantly. South Africa does not have abundant oil and gas reserves, so our knowledge and expertise in these areas is very thinly applied. SACCCS is driving an injection experiment as part of a cabinet-endorsed CCS roadmap which will build skills and provide geological answers. But large investments in capture plants are

unlikely to get funding if storage is not addressed first, because without storage potential there is no reason to capture.

What is the cost of the CCS value chain? Investment decisions are usually made when the window of uncertainty is as narrow as possible. If capture, transport and storage is combined, estimates range from 30 to 50 EUR per ton of CO_2, too wide a spread to instil confidence. When variables such as distance, onshore versus offshore, permeability etc. are added, the range can get even wider. South Africa currently has an environmental levy of approximately 1.30 EUR, and a proposed carbon tax of 8 EUR, per Mwh, which – since 1 MWh produces almost a ton of CO_2 in South Africa – produces a potential carbon price of approximately 10 EUR per ton. When they compare this to the cost of CCS options at today's prices, investment decision makers will seek alternate options.

Where will the funding come from and who will pay? Utilities typically raise funds through revenues from sales, borrowings and equity. As a state owned entity, Eskom has to rely solely on the first two and, since debt must be repaid, the only real revenue stream is from electricity sales. Thus the answer as to who pays is an easy one: every electricity consumer in South Africa. Eskom is regulated and strictly monitored to ensure fair prices for consumers and prudent decision making. An average eight per cent electricity hike is all that the South African economy can handle without negative consequences to industry and the man in the street. But – if we assume a conservative cost for CCS of 30 EUR per ton/MWh and compare this to an average current cost to the consumer of 67 EUR per Mwh – an overnight implementation of CCS in South Africa could conceivably raise the price approximately 40 per cent. That would not be allowed to happen, but implementing CCS at current prices would have a significant impact on the South African economy.

FIVE KEY QUESTIONS

"Where to store the CO_2?

What is the cost of the CCS value chain?

Where will the funding come from and who will pay?

Why implement something with a negative net present value?

Are there preferable alternatives to CCS?"

Why implement something with a negative net present value? Capturing CO_2, transporting it long distances and storing it is not only expensive but reduces the overall net efficiency of a typical coal fired power station. We have access to data that suggests efficiency would drop 20 per cent - and at a cost of 30 EUR per MWh. This penalty to the business must be evaluated by investment decision makers against legislation (we have to do it) and carbon prices (it makes financial sense to do it). Ideally it should also be measured against the cost of not doing it – so as to ensure investment decisions based on a complete picture – but that is hard to quantify and so is often omitted. If that is allowed to happen the discussion focusses on legislation or carbon prices/taxes, which leads to inaction.

Are there preferable alternatives to CCS? Investors always like to weigh up the options. CCS is one of them, renewables another. There is also nuclear and – best of all – just using less. CCS is in a competition for capital and needs to slug it out with other low-carbon options. South Africa has a healthy debate on these matters and good direction through the Department of Energy's Integrated Resource Plan. This contains a mix of options, with a strong reliance on nuclear and renewables and clean coal reducing in significance with older, less efficient stations being decommissioned.

These questions are significant and must be addressed. South Africa has relatively large coal reserves and gas potential, so fossil-based power generation will be with us for decades to come. CCS has been safely and securely demonstrated on small scale demonstration and niche commercial projects worldwide and we regard the technology as evolving but proven. Yet, most forecasts appear correct in expecting its commercial application in emerging markets to take place after 2030.

CCS technologies are expensive but – even with increased capital costs and efficiency impacts - pulverised fuel coal stations embodying them could still be cost-competitive in a carbon constrained regime given the lack of alternatives in South Africa. New renewable technologies (solar and wind) are strong competitors: they still need storage solutions for delivering high capacity factor energy, but this too will come. CCS has a definite role to play in global greenhouse gas mitigation scenarios – in tandem with energy efficiency, renewables and nuclear deployment – and forms a part of almost every carbon mitigation strategy worldwide including our own.

As a country we need to address these questions and, as a corporate citizen, Eskom is working hard to accelerate efforts to prevent catastrophic impacts from climate change which would impact every human alive and in future generations. The future of our beautiful planet is at stake – what better reason to cooperate and collaborate?

UNEP – Making a difference

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THE PROBLEM

As utilities increasingly unbundle their operations and look to develop new generation capacity, the project development process becomes more entrepreneurial as companies compete to bring forward greenfield projects based on a range of new technologies including wind, solar, biomass and geothermal.

However, although many of these technologies can now compete on a least cost basis, they suffer from protracted and risky development processes during which access to financing is very limited.

Most investors are reluctant to offer financing before the permitting process has been completed and the project is ready to build. This means that even the most promising projects develop quite slowly or not at all. The lack of early stage project financing is a market failure that will need to be addressed if the new renewable energy sectors are to expand beyond niche applications. Public finance should help address this financing gap.

THE SOLUTION

In 2010, UNEP Teamed up with the Asian and African Development Banks to Facilitate Seed Financing for Clean Energy Entrepreneurs by creating the Seed Capital Assistance Facility (SCAF). The SCAF aims to help investors access early stage financing to clean energy entrepreneurs in the developing world.

"Entrepreneurs can transform markets, but the environment for entrepreneurship remains weak in many countries, particularly in the energy sector." UNEP's Executive Director Achim Steiner stated at that time. New ventures often lack business development support and seed financing is hard to secure, he added.

SCAF addresses these issues by helping private equity fund managers provide seed financing and business assistance to early stage clean energy projects and enterprise developments.

Donald Kaberuka, President of the African Development Bank, said that this facility is helping African entrepreneurs "jump-start new ventures aimed at solving the continent's energy deficit." SCAF is bringing vitality to Africa's high potential renewable energy sector, he said.

THE IMPACT

Several fund managers have so far been engaged to date in Asia and Africa, employing a range of early stage investment strategies.

In China SCAF is helping fund manager Conduit Ventures set up a clean energy incubation

center with local partners, such as the Shanghai Science and Technology Investment Corporation, to provide entrepreneurs with business development, technology commercialization support and seed financing.

According to Linda Zheng of Conduit Ventures, "SCAF is helping us build a domestic platform for nurturing low-carbon technology companies across China. We expect these centers to create globally competitive companies targeting the low-carbon economy."

In India work is underway with Yes Bank to create a syndicate of financial institutions that will invest seed and follow-on capital in socially and environmentally oriented small and medium-sized enterprises. Mr. Rana Kapoor, Founder / Managing Director and CEO of Yes Bank, said, "Since inception we have focused on integrating sustainability within our business focus and I truly believe that this opportunity to associate with SCAF will enable us to further deliver value to all our stakeholders in accordance with our Responsible Banking philosophy."

Also in India SCAF is helping IndiaCo, a fund manager listed on the Mumbai stock exchange, set up a new fund targeting the energy efficiency sector.

Two regional funds are also in development with SCAF support: the Low-Carbon Accelerator Asia Fund and the E+Co Asia Fund.

In Africa the African Development Bank has added additional funds from its own resources to expand SCAF's reach on the continent. Several projects are under evaluation, with SCAF already engaged with the Evolution One Fund in South Africa to provide seed financing to wind farm developments along the Eastern Cape region.

According to wind farm developer Mark Tanton, "SCAF has empowered us to grow our business by providing access to scarce early stage financing and ensuring that meaningful skills transfer takes place within the country, a critical ingredient for the long term growth and sustainability of our business."


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SCAF IN DETAIL

The two biggest challenges that investors face in providing seed capital financing to early stage projects and companies are the higher transaction costs and insufficient returns offered by these small, less mature and more risky ventures. SCAF is designed to address these two issues, offering investment fund managers two types of cost-sharing support for those willing to include a seed investment window within their overall investment strategy.

SCAF's enterprise development support shares costs associated with sourcing deals, enterprise development services and seed scale investment transactions. As part of this arrangement, the fund manager commits to providing enterprise development services to qualified local entrepreneurs to identify and develop a pipeline of early stage clean energy investment opportunities.

SCAF also offers seed capital support to offset the hurdle of higher perceived risks and lower expected returns when dealing with early stage clean energy project and enterprise developments. SCAF support ranges from10% to 20 per cent of each seed capital investment and is used to cover some of the elevated project development costs that normally are financed by the project developer, such as technical assessments, environmental impact analyses and other aspects of the permitting process.

More information on SCAF is available at **www.scaf-energy.org**

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UNEP – Making a difference

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A new global programme – launched this April - will harness the power of the trillions of dollars that governments spend on public procurement each year towards a shift to a more resource-efficient world.

The Sustainable Public Procurement (SPP) Programme - the first action to get underway as part of the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP) - will assist governments to redirect public spending into goods and services that bring significant environmental and social benefits.

"The Organization of Economic Co-operation and Development nations spent an average 13 per cent of Gross Domestic Product on public procurement in 2011, while in some developing nations this can hit 20 per cent. This adds up to trillions of dollars globally, demonstrating the scale of the opportunity ahead," said Achim Steiner, United Nations Under-Secretary-General and UNEP Executive Director. "Governments can use this potential to lead markets onto a sustainable path by demanding goods and services that conserve natural resources, create decent green jobs, and improve livelihoods around the globe."

The SPP Programme - co-led by the UN Environment Programme (UNEP), ICLEI - Local Governments for Sustainability, and the Korea Environmental Industry and Technology Institute (KEITI) - will enable this shift by improving knowledge of sustainable procurement's benefits and supporting implementation through access to experts and tools.

The launch comes just a few months ahead of the first United Nations Environment Assembly, when the world's environment ministers will meet to discuss the post-2015 Sustainable Development Agenda, with a special focus on sustainable consumption and production.

"A rapid transformation, which will support the post-2015 Sustainable Development Agenda, is eminently possible," said Mr. Steiner. "Governments from across the globe signed up to the UNEP-led Sustainable Public Procurement Initiative at Rio+20, and are backing this commitment with action. This demonstrates that the political will is already in place."

The programme is also supported by the European Commission, the Swiss Federal Office for the Environment, the China Ministry of Environmental Protection, the Republic of Korea, ISEAL Alliance, the Organization for Economic Co-operation and Development, the Swedish Ministry of the Environment, and the United States Environmental Protection Agency.

About the 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP)

The 10YFP is a global framework for action that enhances international cooperation to develop, replicate and scale up Sustainable Consumption and Production (SCP) and resource efficiency initiatives around the world. It was established after Heads of State at Rio+20 agreed that SCP is a cornerstone of sustainable development, and an important contributor to poverty alleviation and the transition to low-carbon and green economies.

The SPP Programme is the first of an initial suite of programmes to be launched under the 10YFP. Other programmes on consumer information, sustainable lifestyles and education, sustainable buildings and construction, and sustainable tourism are expected to be launched in 2014. UNEP hosts the Secretariat of the 10YFP. *For more information, please visit*

www.unep.org/10yfp

Renewables: Increasing Market Share

Renewable energy's share of world electricity generation continued its steady climb last year despite a 14 per cent drop in investments to US$214.4 billion, according to *Global Trends in Renewable Energy Investment 2014* – produced by the Frankfurt School-UNEP Collaborating Centre for Climate & Sustainable Energy Finance, the United Nations Environment Programme (UNEP) and Bloomberg New Energy Finance.

In recent years, *Global Trends in Renewable Energy Investment* has become the standard reference for global renewable energy investment figures. The 2014 edition was showcased at the Bloomberg New Finance Initiative "Future of Energy Summit" in New York from 7-9 April 2014.

According to the report, the investment drop of $US35.1 billion was partly due to the falling cost of solar power systems. Globally, renewables excluding large hydro accounted for 43.6 per cent of newly installed generating capacity in 2013.

Were it not for renewables, world energy-related CO_2 emissions would have been an estimated 1.2 gigatonnes higher in 2013. This staggering number would have contributed substantially to global warming and further reduced the chances of keeping the world on track to reach its climate goals. It is notable that installed solar power jumped 26 per cent – from 31 Gigawatts in 2012 to a record 39 GW in 2013 – even as investment in solar capacity decreased 23 per cent over the same period. Finally, the report also points to the end of a four-and-a-half year decline in clean energy stocks, which bottomed out in July 2012 and then gained 54 per cent in 2013.

The en.lighten initiative

The United Nations Environment Programme (UNEP) - Global Environment Facility (GEF) en.lighten is a public-private partnership created to accelerate a global market transformation to environmentally sustainable lighting technologies.

> An equivalent to over ***US $108 billion*** in avoided electricity bills

en.lighten has developed a coordinated global strategy for the phase-out of inefficient lighting with a focus on providing technical and policy support to developing countries. In doing so, it aims to strengthening capacities among governments, private sector and civil society to lead successful lighting market transformation programmes.

Currently, the en.lighten initiative is focusing on the phase-out of inefficient incandescent lighting in the residential sector. The expansion into other sectors with other lighting technologies, such as innovative light emitting diodes (LEDs) and controls, would significantly cut electricity bills, improve grid and system reliability, reduce fuel imports, improve end-user welfare, and mitigate CO_2 emissions.

UNEP's Executive Director Achim Steiner has pin-pointed it as a good example of public-private cooperation to meet environmental challenges: "The transition to energy efficient lighting is one of the most straightforward and cost-effective approaches to significantly reduce the threat of global climate change."

UNEP estimates that replacing all the inefficient on-grid lighting globally today would result in 957 terawatt hours (TWh) of electricity savings annually, which is equivalent to over US $108 billion in avoided electricity bills and close to 500 million tonnes of CO_2 savings annually.

The transition would also save over US $128.7 billion in avoided investment in 257 large coal-fired power plants.

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"How can **nine billion** *people live well and within the boundaries of the planet?"*

PETER BAKKER
CEO, World Business Council for Sustainable Development

Everyone's business

This year's World Economic Forum meeting in Davos began a renewed drive towards tackling climate change and addressing environmental issues. It thus provided the ideal backdrop for launching the world's largest corporate sustainability road map. Action2020 is truly global in both scope and geographic reach and will be the priority-setting framework for corporate sustainability engagement over the next decade.

It stands apart from other sustainability plans, since it has been created by business for business. Led by the World Business Council for Sustainable Development (WBCSD) – whose 200 members include some of the world's biggest companies – it puts commercial insight very much at the forefront.

At Davos we addressed an audience of the world's most influential business and political players on the initiative, and found them particularly receptive. There is a growing realisation among corporations that being green makes good business sense.

The launch of Action2020 marks the end of one journey, and the beginning of another. The WBCSD started with a simple question: how can nine billion people live well and within the boundaries of the planet? It and the CEOs of its member companies, led an intensive 18-month study of environmental, demographic and development trends, in partnership with the Stockholm Resilience Centre and the World Resources Institute, to find the answer.

The result was Vision2050, a wide-reaching report on the priorities for business and sustainability that must be addressed by mid-century. It found that business has a huge role to play in moderating the negative environmental effects of human

"The ultimate goal for a population of nine billion to live comfortably within the confines of the planet is ambitious, but achievable if businesses follow the ***initiative's innovative and scalable business solutions****. They include leveraging forests as carbon sinks, electrifying cities towards zero emissions and bringing more renewables to the energy mix."*

activity and in improving society and wellbeing. Vision2050's long-term perspective frames the importance of these issues. But, if they are to make an impact on the future, leaders need to act today.

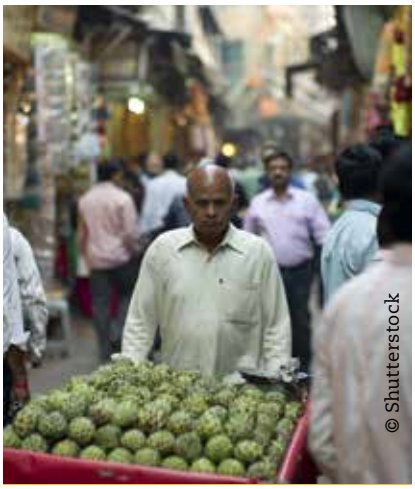
Not many company boards are interested in spending time thinking about 2050. So we decided we needed to make the vision more actionable. Action2020 focuses on strategic solutions that meet targets over the next few years – a time horizon that business and political leaders can readily embrace. It identifies the targets we need to achieve by 2020 to be on track for the longer-term 2050 goal, and the actions businesses can take to reach them.

WBCSD then embarked on an ambitious programme to reach out to as many of its 200 members as possible to make the case for the initiative. Last year I visited member CEOs and representatives in Japan, US, France, Spain, India, China, Norway, Brazil, Netherlands, UK, Switzerland and Turkey – emphasising the role businesses can play in meeting Action2020's overarching objective and encouraging them to back the strategy.

The ultimate goal for a population of nine billion to live comfortably within the confines of the planet is ambitious, but achievable if businesses follow the initiative's innovative and scalable business solutions. They include leveraging forests as carbon sinks, electrifying cities towards zero emissions and bringing more renewables to the energy mix.

These solutions will have a measurable impact on goals that address social and environmental priorities identified by the scientific community. They stem from nine broader priority areas for the sustainable development of our planet and its societies: climate change; release of nutrient elements; ecosystems; exposure to harmful substances; water; basic needs and rights; skills and employment; sustainable lifestyles; and food, fuel, fibre and biofuels.

A societal "must-have" target is set for each policy area, based on scientific fact. These include halting and reversing damage of land and marine ecosystems; addressing rising CO_2 and other greenhouse gas emissions; and ensuring societies move toward environmentally and socially sustainable agricultural systems. They are the targets we need to meet if our planet's systems are to return to a sustainable track over the coming decades.



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So far 44 companies – representing 15 million employees and US$ 7 trillion of revenues – have signed up to Action2020 and more companies are joining following the Davos launch. These global companies, leaders in their sectors, are already collaborating on the pioneering and impactful business solutions under development and on others in the pipeline, to address the urgent needs of the planet and its people.

I am particularly looking forward to the rest of 2014 as we continue to roll out Action2020 across our member companies. To ensure members can have a real impact on global challenges, we will be shaping our activities around the nine priority areas and will be providing support for local implementation of the business solutions.

I hope to see governments across the world take the action needed to ensure these solutions reach their full potential. WBCSD will be supporting an on-going dialogue with policymakers and others to help bring them to scale and ensure that the greater goals of Vision2050 are realised before it is too late.

JOSÉ LUCIANO PENIDO
Chairman, Fibria, Brazil

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Forests of solutions

The growing proportion of humanity that is being brought up and educated in cities, particularly in the large urban centres, tends to see the forest as an environment that is primitive, inhospitable and even uninhabitable – although usually shrouded in magic and mystery.

After all, besides the wonders of fauna and flora – many of which are sadly endangered – that so enchant everyone around the world, the peoples of the forest also live there, often precariously. These communities have striven to preserve the valuble knowledge and wisdom which they have acquired through their intimate contact with nature and which are now coveted for their scientific and commercial value.

They are often manipulated by unscrupulous adventurers and entrepreneurs, who enrich themselves through extracting timber and other products from this rich biodiversity, destroying much of the vegetation in the process and bringing about changes in land use for extensive livestock farming and prospecting for mineral resources, among other consequences.

For these and other reasons, public opinion around the world has great sympathy for those seen as defenders of the forests and their peoples. They admire characters like Kayapo chief Raoni – one of the few who still use a large labret, an Amazonian mahogany disc, embedded in his lower lip – who travelled the world with pop star Sting to encourage the protection of natural habitats, and supported the filmmaker James Cameron in his efforts to block the construction of large dams in the Amazon, such as in Belo Monte. Some of these causes, despite their good intentions, are rooted in romantic visions that overlook both increasingly important aspects of our dependence on the planet's natural resources and the vital role that forests, exploited

with intelligence and responsibility, can play in such a context.

Putting aside differences of opinion regarding what the ideal relationship of humanity with nature should be – differences all too frequently polarized between strictly pragmatic and overly idealistic views – there is one fact that we cannot ignore. In pursuit of comfort, hygiene and well-being, the vast majority of urban people both in developed and in developing countries – adopt lifestyles that require a vast amount of resources, far more than our planet can provide over the long term.

The Stockholm Resilience Centre has identified nine Planetary Boundaries that must not be crossed if we are to keep humanity safe. The bad news is that two of these limits – relating to loss of biodiversity and the nitrogen biogeochemical cycle – have already been exceeded. There are ongoing concerns and discussions about the climate change that is already making itself felt while the world's leaders fail to reach the necessary agreement to implement a strategy to avoid the dramatic climate legacy we are in danger of passing on to our grandchildren.

Another of the planet's limits relates to fresh water: two-thirds of the world's population already lives with some kind of restriction on access to it. In the not-too-distant future, water could be the cause of significant migration, even conflicts and wars. Another planetary boundary concerns land use changes: no more than 15 per cent of the Earth's ice-free land surface should be used for agriculture.

Almost all the solutions for keeping within those nine planetary boundaries lie in the forests. The forest products industry is undergoing a remarkable transition. This is based on three pillars: sustainable development of renewable raw materials found in native forests and plantations; new processes and technologies; and new bio-engineered products for the consumer market.

It will be good for the planet if we use more renewable and recyclable forest products, provided that forests and plantations are managed sustainably. Forest products leave a smaller ecological footprint than alternative mineral or fossil-based materials, which are only renewable over geological periods of time. Forests represent the best investment option for the large-scale carbon deposits needed to mitigate climate change as well as for reversing the loss of biodiversity, preserving natural water cycles and providing the resources that society demands for its well-being.

It is within our reach to keep 30 per cent of the planet's surface covered with forests (the proportion was 27 per cent in 2010). WWF has set a global target of Zero Net Deforestation and Degradation to be achieved by 2020. This is perfectly possible and fully supported by the forest-based industry.

Between 2020 and 2050 we can carry out a major commercial planting and reforestation programme, amounting to around 400 million hectares of new forests, providing the materials that industry needs and resulting in the sequestration of 65 billion tons of carbon. That would be a considerable benefit, given that the existing forests currently store 652 billion tons of it.

Such a rate of increase in planted forests would mean that five million hectares of natural forests, no longer needing to be managed, could be returned to preservation purposes each year. Harvesting could be transferred to plantations yielding higher productivity and quality due to classical techniques of genetic improvement and advanced forest management practices.

New technologies are radically transforming the forest products industry. At the very least, they are carbon-neutral, since photosynthesis is at the basis of biomass formation. And such new products as biomaterials, nanofinishings, biofuels and biochemicals, are increasingly present in consumers' daily lives, bringing their modern lifestyles into closer alignment with a low-carbon economy. Meanwhile young talent can be attracted into careers in the high-tech agroforestry business and in managing the ecosystem services that the forests provide.

Chief Raoni, you, me and our grandchildren can be hopeful for the future: the solutions are in the forests, and increasingly within the reach of us all.

"The forest products industry is undergoing a remarkable transition. This is based on three pillars: sustainable development of renewable raw materials found in native forests and plantations; new processes and technologies; and new bio-engineered products for the consumer market."

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Concrete commitments

BERNARD FONTANA
CEO, Holcim

Biodiversity is important for business. That is well documented and increasingly accepted. What is less clear is what business can – and should – tangibly do about it. For me, it is clear that an organisation needs to properly understand the relevance of this very complex topic both broadly and more specifically within the context of its business. There are a number of aspects it needs to consider. Let me expand on some of these.

First of all, a company should determine the relevance of the challenge and the extent to which its operations impact on biodiversity and its dependence on the services – and resources – ecosystems provide. This, in turn, will allow it to ascertain the materiality of the topic and to understand the magnitude of the consequences of not managing the impacts effectively. In Holcim's case, these could include difficulties in obtaining and renewing extraction permits, restrictions on our freedom to operate, and loss of reputation. Of course, it is equally important to understand the reverse side of the coin – the opportunities that can be leveraged.

Once the potential impacts and opportunities are understood, a company needs to determine what can realistically be achieved and what actions can be taken to reduce risks and leverage opportunities. Solutions need to be developed so as to conduct business while maintaining and enhancing biodiversity. Commitments need to be set to align the organisation and roadmaps need to be developed to ensure they are honoured. This is not a simple exercise. Biodiversity is a complex topic, and we recognize that we need the help of experts. Working with credible experts from IUCN has been essential in helping Holcim develop our biodiversity programme with the confidence that while we may not yet have all the answers, we are at least asking the right questions and working with those that can help us find them. This has resulted in us working together to embed biodiversity considerations into our decision making and site management, so as to manage our impacts appropriately.

Companies do not operate in a vacuum. Even if businesses are proactive and want to implement a robust system, they cannot solve the biodiversity challenge alone. It is clear that governments and policy makers also have a role to play. They must provide the enabling framework and

ensure that requirements placed on companies contribute meaningfully to biodiversity.

In short, "smart" legislation is important in scaling up good practices by holding everyone to the same high standards and requirements. Without this, the good work done by responsible companies can be undermined, or even negated, by less responsible players. Policies that reward proactive companies and encourage laggards can increase the pace of biodiversity stewardship.

Working with the IUCN and an appointed Independent Expert Panel (IEP), Holcim has implemented a Biodiversity Management System that helps us understand the importance of biodiversity on our sites. It further helps us identify the level of risk based upon the potential impact and to know which sites are sensitive. This helps prioritise efforts and allows us to focus them and resources into developing Biodiversity Action Plans where these are needed and appropriate.

Implementing the Biodiversity Management System is supported by a company-wide directive, which lays out our expectations of how our Group companies must manage biodiversity. We monitor the level of development of biodiversity action plans at sensitive sites each year. Twenty per cent of our about 440 active extraction sites are currently classified as "sensitive" – and 90 per cent of these have implemented Biodiversity Action Plans. Overall, about half of all our sites have such Plans in place. We continue to work to ensure we understand the biodiversity risks at all our sites in order to address them adequately.

However, having a system in place is not enough in itself. What is also required is a simple and standardized way to monitor the effectiveness of our actions at all our sites, so as to be able to demonstrate to ourselves and interested stakeholders that we are indeed making a difference.

"'smart' legislation is important in scaling up good practices by holding everyone to the same high standards and requirements."

With this in mind, the IEP has been working with Holcim over the last three years to develop an indicator system to ascertain the condition of biodiversity on our sites and to measure how it is changing over time.

The data gathered in these Biodiversity Condition Indices can be nationally, regionally and globally collated, allowing us to establish robust benchmarks and to set meaningful targets and monitor progress over time. We aim to be responsible stewards of the land under our responsibility, and now we have a tool to measure the effectiveness of our biodiversity management.

Biodiversity is simply too important a subject to manage in isolation. Holcim is happy to learn from others and to share our own knowledge and tools. We continuously engage with other companies in our own, and other, sectors, as well as with regulators to promote effective biodiversity management.

Drawing from its experience with Holcim, IUCN has published a series of guidelines and recommendations to scale up biodiversity management in the building materials sector which targets both companies and policy makers.

In starting to address our biodiversity impacts and challenges, Holcim has undertaken a journey. We have reached some important landmarks, but are aware that there is still a long way to go.

We will continue working with the IEP to help us pilot, and then implement, the biodiversity indicators system throughout the Group. Holcim is determined to demonstrate its commitment to good biodiversity stewardship further by means of medium and long term biodiversity targets and aspirations.

People

Ligia Noronha

Dr Ligia Noronha was appointed as **Director of UNEP's Division of Technology, Industry and Economics (DTIE)** in early 2014. Prior to this appointment, she was the Executive Director of Research Coordination at the Energy and Resources Institute (TERI) and Director of the Resources, Regulation and Global Security Division.

Among other distinguished positions, she has acted as Secretary of the Asian Energy Institute and has held the Michael Hintze Energy Security Visiting Senior Fellowship at the Centre for International Security Studies (CISS), University of Sydney, Australia. She has also acted as Team Leader of Ecosystem approaches to Human Health at the International Development Research Centre of Canada.

Dr. Noronha serves on the National Security Advisory Board of the Government of India; is Member of the Global Agenda Council on Responsible Management of Natural Resources, World Economic Forum; and is a Member of the "Good Governance of Extractive and Land Resources" thematic group of the UN Sustainable Development Solutions Network, among other key positions.

Her main interests include resource security and efficiency; regulation and governance of energy, minerals, and the environment; South-South Cooperation with Africa; sustainable consumption and production; and global issues around trade, environment and sustainable development.

Jacqueline McGlade

Professor Jacqueline McGlade was appointed as **UNEP's Chief Scientist** – the lead advisor to the Executive Director on matters of science and research – in early 2014.

She first joined UNEP in September 2013 as Special Advisor to the Executive Director on knowledge management and science. Prior to this post, she was Executive Director of the European Environment Agency from 2003-2013 and held a number of academic positions.

Among other posts, she has also acted as Director of the Centre for Coastal and Marine Sciences of the UK Natural Environment Research Council and as Senior Scientist at the Bedford Institute of Oceanography in the Federal Government of Canada. She has also held a number of key participatory and advisory roles at both the national and international levels.

Professor McGlade's activities continue to focus on participatory knowledge systems and citizen science, the dynamics of ecosystems and planetary systems, sustainable development and the governance of natural resources and environmental informatics. She has over 200 peer-reviewed papers, articles and other resources. In addition, she is the founder of her own software company, has produced and presented award-winning feature films, TV and radio series, and has received numerous international awards.

Alou Keita

Director General of CAMIDE, Opening doors to Micro-finance

Alou has created one of the most successful of Mali's **community managed village banking networks**, providing savings, credit and banking facilities for village communities. Unique among other village finance offices, the input of capital from migrant workers in France allows the banks to strengthen villages which have been weakened by emigration and the ripple effects of rural poverty.

Wang Shi

Chairman and Founder
China Vanke Co., Ltd.

Wang Shi is the **Chairman and Founder** of China Vanke Co., Ltd. Under his leadership, Vanke has grown into the world's largest residential home developer by sales revenue and China's pioneer in green home construction.

In recent years, Wang Shi led environmental initiatives among Chinese private sector companies particularly in the areas of natural habitat conservation, garbage recycling, and forest conservation. In 2004, he co-founded Society of Entrepreneurs and Ecology, China's largest environmental networks involving 200 private sector entrepreneurs. He is currently the Executive Director of the One Foundation and Shenzhen Mangrove Wetlands Conservation Foundation, which are China's first public foundations. He was elected Chairman of China Entrepreneurs Forum in July 2012.

As a passionate mountaineer, Mr. Wang reached the peak of Mount Everest from North and South faces in 2003 and 2010 respectively. He is the 11th person in the world to accomplish "7+2" – reaching the Seven Summits in 2004 and North and South Poles in 2005. With a global vision of environmental sustainability, he sits on the World Economic Forum Global Agenda Council on Governance for Sustainability, with particular focus on forest, biodiversity, and climate change. Wang Shi is now a visiting fellow at Harvard University specializing in business value and ethics. He has teaching roles at prestigious universities around the world such as Harvard University, Columbia University, MIT, National University of Singapore, Peking University.

One of Alou's key innovations is a money transfer service for those living abroad which offers an effective response to the challenge of sending money home to remote villages. Alou's village banks (officially known as village finance offices or "caisses") differ from many other microfinance establishments. They are the only financial institutions in the region of Kayes, Mali, that are completely managed by villagers and do not require a minimum amount of savings in order to qualify for credit.

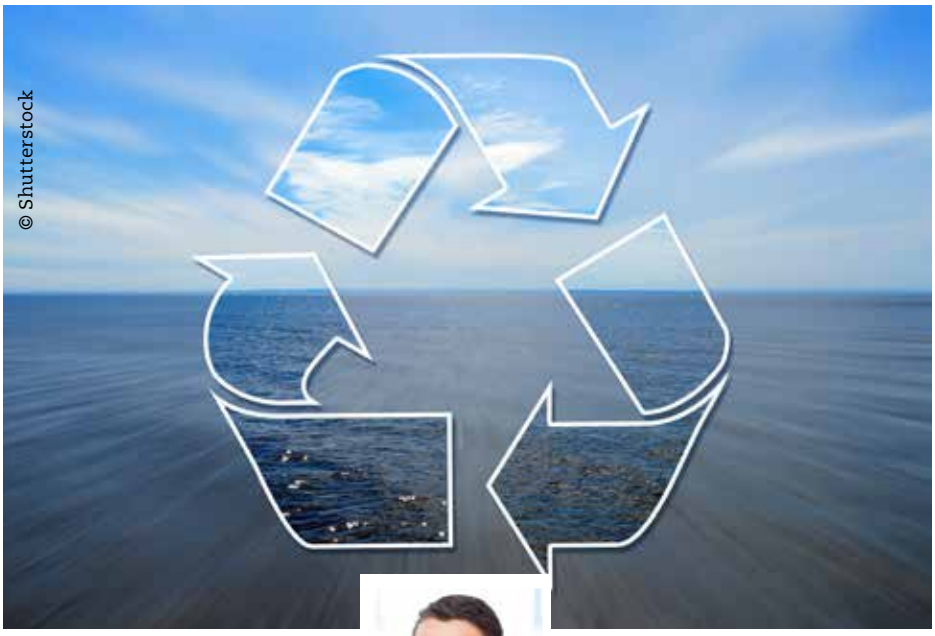
Alou's Programme for Self-managed Savings and Credit Systems (PASECA) is a banking system that preserves traditional elements of village life, such as participatory decision-making through village general assembly meetings and the honor system to aid in loan repayments.

The banks also have a built-in community improvement mechanism and mandatory representation of women on their boards. One group of village banks, the first of its kind in Mali, is completely run and managed by women. Each bank is adapted to the needs of the particular community after basic training by Alou's organization. Poverty, drought, famine and unemployment have long made human capital the Sahel region's main export.

The region of Kayes (where Alou's pilot is situated) has over 40,000 migrant workers in France, out of a total adult male population of some 100,000. The result of migration has meant that many Malian villages, especially in Kayes, are left without the labor and capital needed for economic growth.

Over 80 per cent of Malians live in rural areas, while commercial banks do not operate outside larger towns due to the lack of infrastructure (electricity, viable roads, and so on) and the relatively high cost of handling small loans or small sum bank accounts that rural villagers are most likely to open.

More than 60 per cent of money transferred to Mali from overseas is done in this way. There have been reports of travellers being mugged or even killed, as criminals often target returning travellers known to carry large sums of money.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KASPER RORSTED
Chief Executive Officer, Henkel

Achieving more with less

Access to clean water is one of the biggest current and future challenges facing the world. Society's thirst for freshwater already outpaces supply in some regions. And as the global population increases, living conditions improve and economies grow, the demand for water will only rise further. According to the 2030 Water Resources Group, the demand is expected to exceed the available supply in China by 20 per cent, and in India by 50 per cent, by 2030. This poses a significant threat to our future, as water scarcity, poor water quality and inadequate sanitation can impact food and energy security and the health and livelihoods of poor families and children around the world.

At Henkel, we share and endorse the World Business Council for Sustainable Development's vision of nine billion people living well within the resource limits of the planet by 2050: so we recognize the need for industry to act. Access to clean water is an integral part of what it means to live well: so we must manage our resources carefully and make sustainable water use a priority.

Henkel has a clear sustainability strategy: to achieve more with less. By 2030 we aim to triple the value we create for the footprint made by our operations, products and services. We see our commitment to sustainability as part of our social responsibility and a critical factor in the long-term success of our business. As part of our ambition, we have identified six focal areas, and measure our progress in each against five-year targets established in 2011. We selected water and wastewater as one of these focal areas and set out to reduce our water consumption per production unit by 15 per cent by 2015.

To achieve our goal, we have set targets for our own operations and developed an ambition to manage water resources better across our entire value chain. This means finding ways to reduce both water consumption and wastewater volumes through our products, our partners and our people.

We can directly make a difference in our own business by providing leading sustainable products and technologies. We are working to develop and reformulate products that require less water in both production and use. In 2011, for example, our Beauty Care business introduced *got2b Powder'ful*, a new styling powder that consumers can apply directly to their hair when dry. Thanks to a unique powder formulation, we were able to reduce the amount of water required and cut the overall carbon footprint by 90

per cent. Similarly, we have improved the formula of other products to make them more sustainable. We reformulated our Fa body wash, so that consumers require less water when rinsing. And we have increased the proportion of readily biodegradable ingredients in soaps, shower gels and shampoos to 90 per cent in order to reduce wastewater pollution.

Besides designing smarter, more efficient, products, we are constantly improving our production and logistics processes. In 2013 our Adhesives Technologies business opened the world's largest adhesives plant in Shanghai, cutting water consumption in half, compared with a traditional adhesives plant, by reusing condensed water from steam. Similarly. our adhesives plant in South Africa introduced a new ultra-filter technology for treating wastewater: as a result, its quality now significantly exceeds the local legal standard.

Improving our products alone will not be sufficient. We work with our value-chain partners – suppliers and business partners – to ensure that they understand and share our vision of achieving more with less. In 2011, Henkel and five other chemical companies founded Together for Sustainability, a global supplier engagement programme to assess, improve and audit our suppliers' sustainability standards and practices.

Furthermore, we are partnering with leading global retailers to inform consumers about sustainable products and how to use them in an environmentally responsible way. We have also developed online Resource Calculators to educate consumers on how they can save water when showering, brushing their teeth or washing their hands.

Finally, we encourage our employees to act sustainably. In 2012 Henkel started training employees as "Sustainability Ambassadors" so that they can share their passion and commitment to sustainability with co-workers, suppliers, customers and consumers and other stakeholders. Certified Ambassadors visit local primary schools and explain to the students how everyone can contribute to a more sustainable future, such as by saving water. By the end of 2013 more than 1,500 such Ambassadors had shared their insights with around 15,000 children in more than 25 countries worldwide.

Henkel is making very good progress on its sustainability strategy. Thanks to all the above efforts, we have reduced our water consumption by 51 per cent per tonne of output over the last ten years. We recognize, however, that the work is not done. We must become five times more efficient if we are to live within the planet's resource constraints by 2050. We must achieve more with less – both as a company and a society.


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*"We must become **five times** more efficient if we are to live within the planet's resource constraints by 2050."*

ANNISE PARKER
Mayor, City of Houston

Greening energy's capital city

You can't manage what you don't measure. It is an old adage that remains true today. Unless you measure critical success factors you cannot know if your plans and programmes are getting better or worse.

The City of Houston looks at three areas very closely when we are evaluating progress in reducing greenhouse gases (GHGs): energy use, transportation and waste. Our 2007 Community GHG emissions inventory showed that 58 per cent of GHG emissions came from the building and industrial energy sector, 32 per cent from the transportation sector and 10 per cent from the waste sector.

We have focused on those three areas to reduce our emissions, and with good success. The City's municipal operations emissions have realized a 26 per cent decrease from the 2007 inventory. We are very proud of that, and at the C40 Cities Climate Leadership Group Mayors Summit in Johannesburg, South Africa, I announced that the City of Houston will commit to a five per cent GHG reduction in 2014 and 2015 for a 10 per cent total reduction by 2016.

We will get there by continuing energy efficiency retrofits and LEED certification in municipal buildings – just this year we committed to another $10 million project in our libraries – and we will work to increase the purchase of renewable power for them. We will utilize new technologies, such as LED streetlights and/or smart energy tools, to reduce energy usage. And we will continue to expand the use of hybrid, electric and CNG powered vehicles.

How did we achieve our 26 per cent decrease?

ENERGY

The City has retrofitted six million square feet of buildings and invested $60 million in energy efficiency since 2008. As a result, we are saving over 22 million kWh of electricity every year: our simple payback is less than 10 years. The City buys 623,000 MWh of green power per year, meeting half its annual electricity demand, and making Houston the number one municipal purchaser of renewable energy in the U.S. And we have replaced the incandescent lamps at all of our 2,450 traffic signalized intersections with LEDs, saving over $3.6 million and reducing energy usage by 9,821,496 KWh per year.

We have benchmarked over 300 city facilities and are monitoring their energy use intensity. And we have completed 23 LEED certified building projects, with another four projects in the pipeline for 2014.

TRANSPORT

We are expanding our light-rail infrastructure, adding three new lines – an investment of $4 billion: late last year, a 5.3 mile extension of the existing Main Street Line

opened to the public. Once all the new lines are open, Houston's rail will expand from 7.5 miles to 39 miles. The expanded system will be an essential element of the city's plans to meet present and future transportation and environmental challenges. We operate 400 diesel-hybrid electric buses, accounting for one-third of our fleet. Hybrids also now constitute more than 50 per cent of the light-duty fleet, giving us the third largest municipal hybrid fleet in the U.S.

We have converted 15 Toyota Prius hybrids to plug-in hybrid electric vehicles. Most recently, we bought 27 Nissan LEAF battery electric vehicles, and are purchasing another 10 in 2014. Each of these vehicles is estimated to save the city $7,000 in fuel and maintenance over a three year period. Just the current 27-strong fleet will accrue $110,000 in annual savings compared to the cost of running internal combustion engine vehicles.

The City has also created an online "green" car sharing programme for municipal vehicles. Houston FleetShare is a motor pool using electric vehicles and hybrids, and has brought about a 34 per cent decrease in the size of the City fleet, 35,000 gallons of fuel savings, and reduced emissions. Last year we started a bike share programme with over 250 bikes and 30 kiosks throughout downtown and adjacent neighborhoods. Houston B-cycle has had over 55,000 checkouts and 180,000 miles have been ridden in the first nine months.And our Bayou Greenways 2020 programme will add 1500 acres of new and equitably distributed green spaces that can also serve as flood control and storm water quality enhancement.

"The City buys ***623,000 MWh of green power per year,*** *meeting half its annual electricity demand, and making Houston the number one municipal purchaser of renewable energy in the U.S"*

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The programme will complete 150 miles of continuous all-weather hike and bike trails meandering through those greenways, greatly enhancing quality of life and reducing vehicle miles travelled.

WASTE

In 2008 the City's recycling rate was a very low 2.6 per cent, for a number of reasons, unique in some respects to Houston. Our current rate has now grown to eight per cent – and we are also now composting garden and tree waste, thus increasing our overall diversion rate to 22 per cent. And in the past year we have expanded single stream recycling to 70 per cent of residents. Yet we are still not satisfied and so are actively engaged in the procurement process to seek a better, more innovative approach.

We are working with the private sector and Bloomberg Philanthropies on an innovative co-mingled waste programme, utilizing new technologies, that could divert 75 per cent of the mixed municipal solid waste to reuse/recycling, composting and clean fuel processes. Assuming we are successful in securing a feasible approach, we will achieve reductions of 3.72 metric tons of carbon equivalent per ton of municipal solid waste diverted, not including significant reductions from vehicle miles traveled as a result of optimizing routes.

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The City has committed to, and invested in, many programmes that reduce cost, improve efficiencies, and decrease greenhouse gas emissions. And we are more energized than ever to continue our work to become more resilient and prepare for changes to our climate.

Indeed, Houston has proved that it can maintain its title as the energy capital of the world while pursuing green policies that lift our reputation as a world leader in sustainability.

Products

Eco Friendly Products

Green living is a great way to improve your overall life, save money and help create a more eco-friendly environment. Now more than ever, it is important for people to take **action** and begin **preserving** the environment. Implement-Recycled-Goods

Choosing products created with **recycled** items is a great way to **lower** your **carbon footprint**. Several companies produce a wide array of products made from used items and goods. These companies transform what some would call garbage — such as paper, textiles, fabrics, tires and tubes — into **stunning rugs, baskets, purses, decorations, articles of clothing and table covers**.

Use-Organic-Cotton

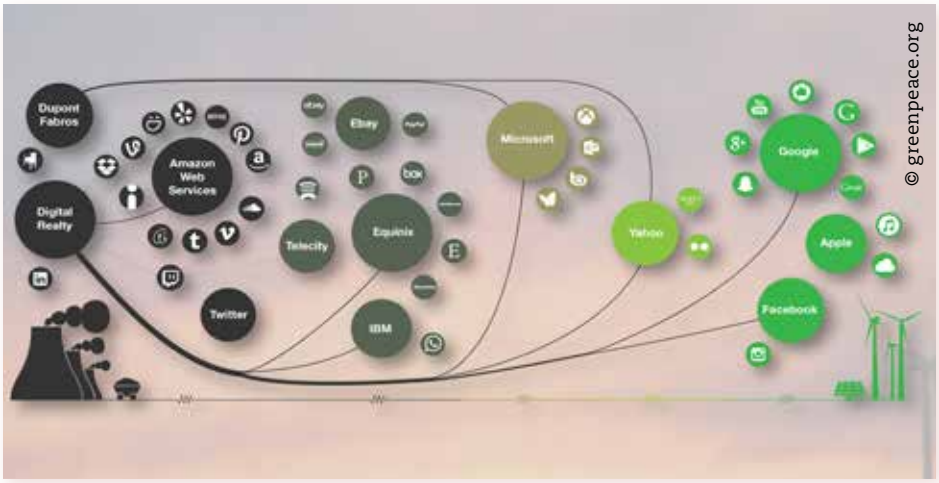
The use of organic cotton is on the rise for both eco-friendly shops and **fashion designers.** Grocery bags, carry bags, cotton clothing, **designer bags**, twines and yarns are a few of the items you can buy that are made from organic cotton.

Bamboo clothing

The longest grass in the world, bamboo has various benefits that make it ideal for eco-friendly clothing. Fashion designers have recently started using bamboo in their apparel and accessories. Clothing created from bamboo is generally silky soft, durable and less expensive than silk.

Innovation

Apple, Facebook, Google Lead Tech Firms on Renewables, Greenpeace Says



© greenpeace.org

Apple, Facebook, and **Google** are leading a growing number of technology companies working to power the internet with **100 per cent renewable energy**, signaling a major shift in the sector over the past two years, and leaving Amazon Web Services behind, according to Greenpeace research.

Amazon Web Services, which hosts the data for many of the internet's most popular services, powers its infrastructure with polluting energy sources that contribute to global warming, according to Clicking Clean: How Companies are Creating the Green Internet.

Greenpeace evaluated the energy choices of 19 leading internet companies, surveying the electricity supply chains of over 300 data centers. Five of those companies have committed to a goal of powering their operations with 100 per cent renewable energy.

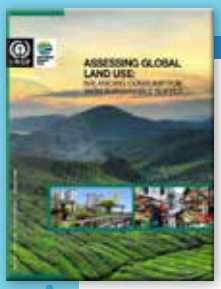
Apple became the first company to achieve 100 per cent renewable energy goal to power its **iCloud**. It is operating the largest privately owned solar installation in the US at its North Carolina data center. Apple led the companies evaluated, with a Clean Energy Index of 100 per cent, according to the report.

Facebook flexed its muscles to push its utility in Iowa, MidAmerican Energy, to power its data center there with **wind energy**. MidAmerican responded by investing $1.9 billion in wind power generation, placing the world's largest-ever order of onshore wind turbines, in part to meet the social network's demands.

Greenpeace claims that technology companies have "immense power" either to drive a renewable energy revolution, or to tie the new digital economy to polluting sources of power. If the internet were a country, its electricity demand would currently rank sixth, the report says. Estimates from the industry say internet data will triple from 2012 to 2017.

Books

www.unep.org/publications



Assessing global land use: Balancing consumption with sustainable supply 2014

This report explores how the management of land-based biomass production and consumption can be developed towards a higher degree of sustainability across different scales: from the sustainable management of soils on the field to the sustainable management of global land use as a whole.

Sustainable public procurement: A global review

This report examines the state of sustainable public procurement policies and practices being undertaken by national governments worldwide in the last five years. The research included a comprehensive literature and desktop review, 19 interviews, six country case studies and a survey of 273 SPP experts worldwide. The objective was to create a baseline analysis that examines the evolving field of SPP and the drivers, barriers, needs and opportunities in SPP.

Drawing down N2O to protect climate and the ozone layer: A UNEP synthesis report

This report addresses the benefits of drawing down nitrous oxide (N_2O) emissions. N_2O is now the most significant ozone-depleting substance emission and the third most important greenhouse gas released into the atmosphere. Global anthropogenic N_2O emissions are rapidly increasing and are expected to almost double by 2050 unless mitigation action is accelerated. The continued build-up of N_2O in the atmosphere will continue to deplete the stratospheric ozone layer and in so doing will to a degree undermine the achievements of the Montreal Protocol. The build-up of N_2O will also make it more difficult to achieve climate targets.

UNEP 2013 Annual Report

The 2013 Annual Report lays out the highlights of UNEP's work in 2013, a year in which the organization's Governing Council met under Universal Membership for the first time and the strengthening process agreed the previous year began in earnest. The report focuses on UNEP's achievement in the key focus areas of Climate Change; Disasters and Conflicts; Ecosystem Management; Environmental Governance; Harmful Substances and Hazardous Waste; Resource Efficiency; and Sustainable Consumption and Production. It also highlights the key role UNEP plays in providing environmental leadership to the UN system and the international community: for example, in 2013, nations adopted the Minamata Convention on Mercury, the first new global multilateral environmental agreement in almost a decade.

The emissions gap report 2013: a UNEP synthesis report

The emissions gap in 2020 is the difference between emission levels in 2020 consistent with meeting climate targets, and levels expected in that year if country pledges and commitments are met. As it becomes less and less likely that the emissions gap will be closed by 2020, the world will have to rely on more difficult, costlier and riskier means after 2020 of keeping the global average temperature increase below 2° C. If the emissions gap is not closed, or significantly narrowed, by 2020, the door to many options limiting the temperature increase to 1.5° C at the end of this century will be closed.

Guidance manual on value transfer methods for ecosystem services

The purpose of this guidance manual is to show how the value of ecosystem services can be estimated and incorporated into decision making. Specifically, it is designed to help a broad audience of conservation managers, government officials, private sector managers, NGOs, and statisticians to understand the available information on the values of ecosystem services and how this information can be transferred to inform the decisions that they make.

YAO MING

"In 2012, with the momentum in public opinion set in motion by Yao's campaigns, the Chinese government banned shark fin from being served at all official meals."

When shark fin traders in Guangzhou were surveyed about reasons for the recent sharp drop of up to 50 per cent in the price of shark fins, one of their first responses was because of "those Yao Ming ads."

Through his long partnership with the organization WildAid, Yao Ming's campaigning helped curb a spike in China's consumption of shark fin soup into a controversial – and now declining – product.

Yao Ming was the first Chinese player to truly thrive in the National Basketball Association, where he played from 2002 to 2011 and became a household name both at home in China and abroad. It was during the height of his popularity in 2005 when he joined WildAid's campaigns to reduce demand for wildlife products, becoming their most prominent celebrity ambassador.

A booming economy was bringing new found wealth to an enormous number of Chinese people, rekindling traditions of consuming wildlife products, once limited to a small few, but now affordable to millions. One of the most notable of these products is shark fin, dried and served in soup that often fetches $100 per serving. It is estimated that over 73 million sharks are killed each year to satisfy the demand for shark fin soup, with sharks often finned at sea, cutting off just their fins and tossing the still-alive shark back into the ocean to sink and drown.

When approached, Yao Ming was listed as the most influential celebrity in China, and he agreed to use this star power to address the rapid rise in consumption of wildlife products such as elephant ivory and shark fin. Over 300 media outlets attended Yao Ming's first press conference for these new wildlife campaigns in 2006. He quickly began starring in television public service announcements (PSAs), blocking bullets aimed at elephants and pushing away a bowl of shark fin soup while telling the audience to do the same.

These PSAs were broadcast thousands of times each year on many of China's biggest TV networks and outdoor billboard screens, with the message "when the buying stops, the killing can too" becoming synonymous with Yao Ming.

As one of the first celebrities to speak out against shark fin, many others followed in Yao Ming's footsteps, including some of China's best known business elite, and over the span of just a few years shark fin soup went from being de rigueur at important business meals to what influential real-estate tycoon Wang Shi (see People section) calls "out of style to order."

Later in 2012, with the momentum in public opinion set in motion by Yao's campaigns the Chinese government banned shark fin from being served at all official meals as part of an effort to limit government waste and corruption,. Official figures on shark fin imports and consumption are hard to come by, but a recent reduction in shark fin consumption in China, Hong Kong, and Macau has been shown by significant reported declines in fin prices and changes in consumer behavior. Shark fin traders interviewed Guangzhou in November 2013 reported a 30-50 per cent drop in price over the past two years, claiming "shark fin is the same price as squid now."

A WildAid survey in August 2013 revealed that 85 per cent of 1,568 respondents in Beijing, Shanghai, Guangzhou, and Chengdu said they stopped eating shark fin soup in the last three years and 65 per cent of those said awareness campaigns were a reason why they stopped.

In 2013, the government of China implemented its ban of shark fin from state banquets and Hong Kong announced a similar ban. In June 2013, Brunei became the first Asian country to adopt a nationwide ban on the catch and landings of all shark species, thus ending the sale of any shark products in the domestic market.

After establishing the Yao Ming Foundation in 2008 to improve education for children, Yao also continues to campaign for wildlife, figuring in recent broad-based campaigns to reduce the demand for ivory and rhino horn. He has filmed a number of new PSAs and even a documentary to be aired on China's CCTV this year about his trip to Africa where he witnessed the impacts of elephant and rhino poaching first hand.

Yao's basketball career is now behind him, but his efforts to protect wildlife continue to gain strength. In March, Yao delivered a petition during the opening session of the National People's Congress (NPC) asking China's government to ban sales of ivory. He once told the press: "When people in China know what is happening to the ivory trade, they will say no to these products."

"when the buying stops, the killing can too."

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