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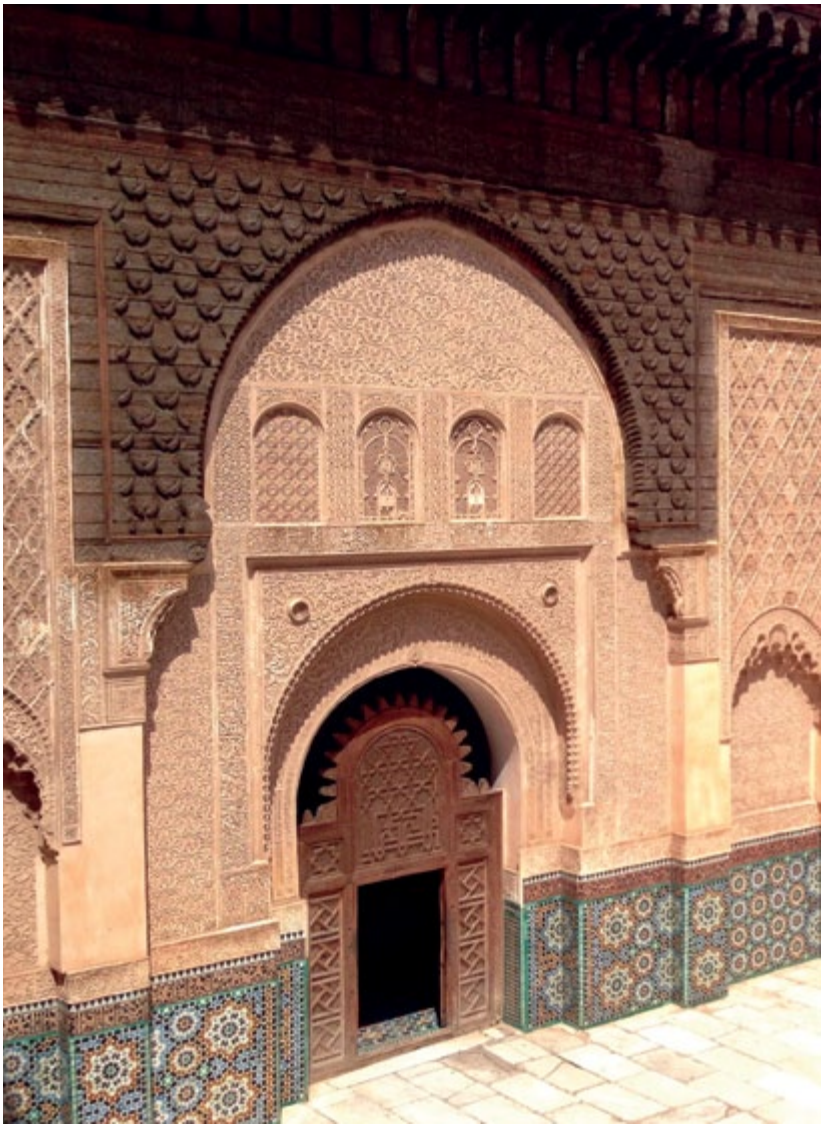

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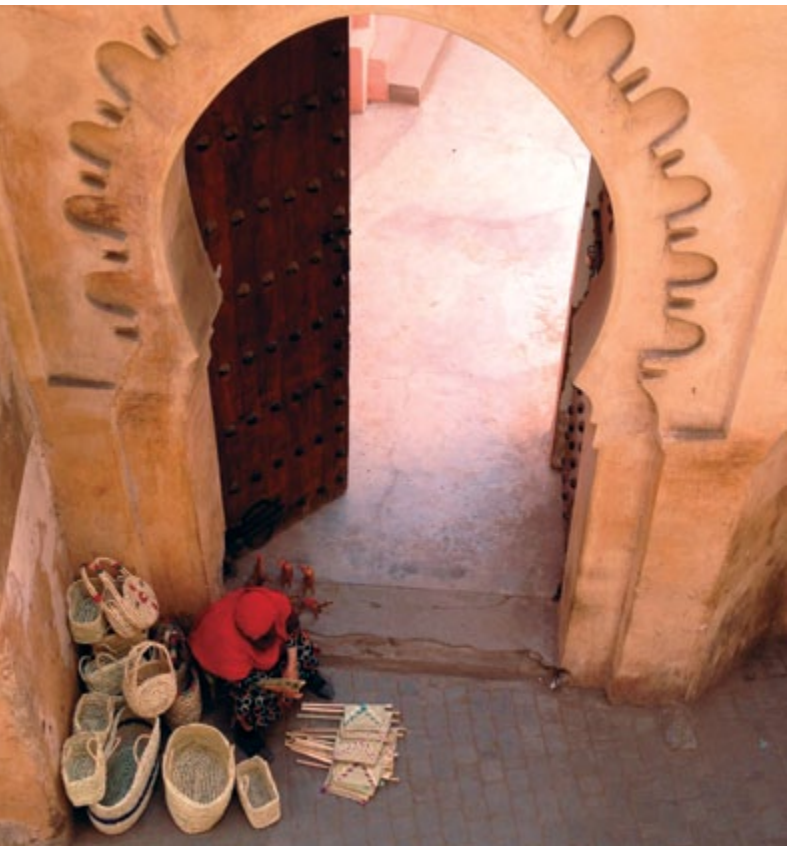

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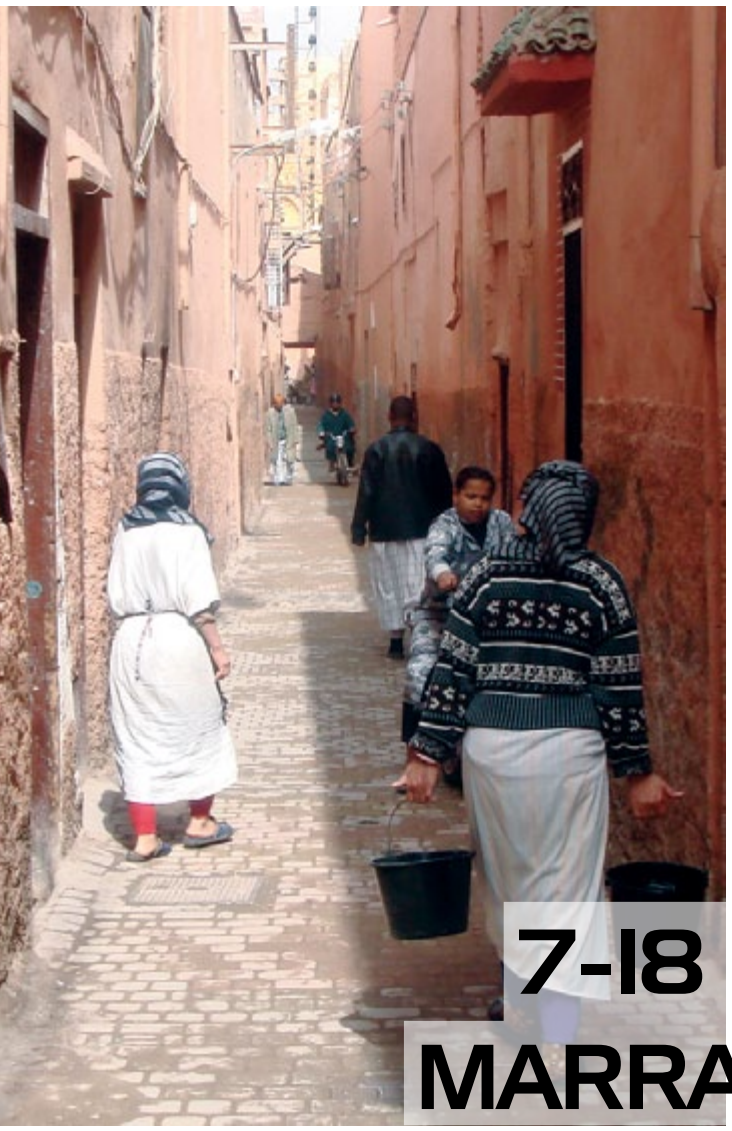

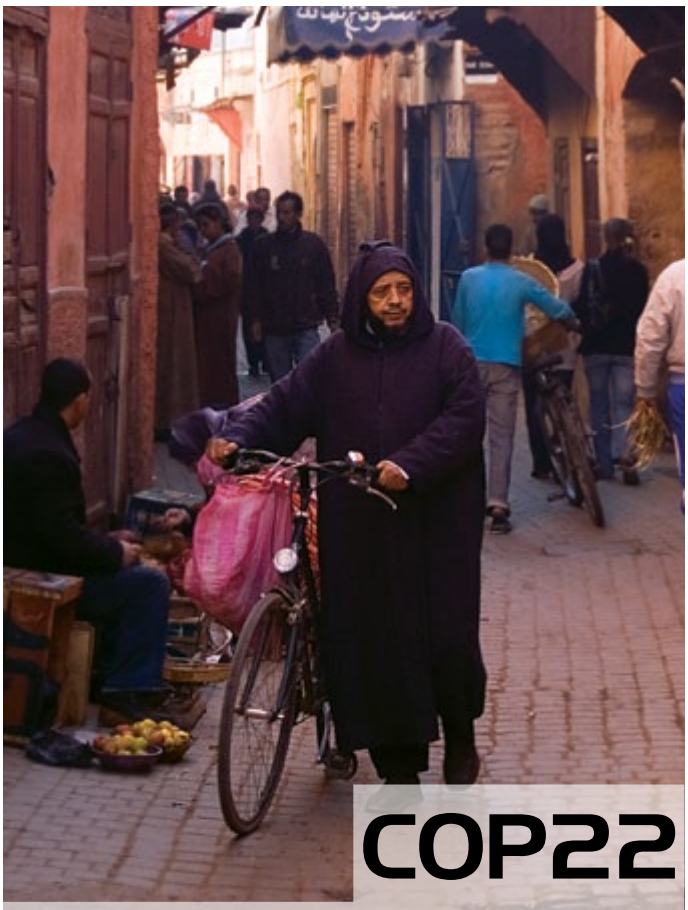

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- Projects must provide long-term benefits to the communities that undertake them, such as job creation and the conservation of natural resources.
- Projects must undergo third party validation and verification – to show that the carbon reductions are real and permanent.

Carbon Clear is proud to have offset the emissions associated with production and distribution of this project.

www.carbon-clear.com

INSIDE

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CHRISTIANA FIGUERES,
UNFCCC Executive Secretary

I have been pellucidly clear that the agreement in Paris is not going to reach a 2 degree limit on temperature rise as though that were something we can take off a magical shelf and put on the table. I have been equally clear that getting us on to the 2 degree pathway is entirely possible. This is why the Paris agreement will have two very important components with regard to emission reductions: First, it will harness all the national climate change plans which as a group, if fully implemented, already substantially reduce the business as usual growth in emissions. Second, in recognition that this first set of INDCs (the national climate action plans) is a departure point and not a destination, the Paris agreement will construct a path of ever-increasing emission reductions with periodic checkpoints of progress until we get to the 2 degree pathway.

Christiana Figueres, November 2015, UNFCCC Executive Secretary

Photo: © United Nations

PARIS WILL NOT BE THE END, BUT THE END OF THE BEGINNING

Our goal is to arrive at a 'Paris Alliance' comprising four objectives, four pillars… the first pillar must be the agreement itself, one that is universal and legally binding. That agreement must be fair, by which I mean that it must provide for efforts that are differentiated according to country, go hand in hand with financial and technological solidarity for the poorest countries, and take greater account of the effects of climate change.

The agreement must be sustainable, and must neither ignore the period up to 2020 nor stop suddenly in 2030; it must include immediate action and be open to extension because it is not possible for us to renegotiate the common rules and principles every ten years. It will need therefore to include a "review mechanism" that regularly invites States to assess the initial commitments and upgrade them. Indeed, a sustainable agreement is a necessary condition for an ambitious agreement: COP21 must be more than simply an achievement; it must also and above all be a point of departure for a further period and a renewed effort.

The second objective is the presentation by all countries, before the COP even takes place, of their "intended nationally determined contributions", or INDCs. For the first time in the history of climate negotiations, all States have undertaken to give commitments on the reduction of their greenhouse gas emissions.

The third pillar is formed by those actions that require financial and technological resources… where the climate is concerned – the two domains are not unconnected – we need to guarantee fulfilment of the commitment given in Copenhagen in 2009 to raise every year over the period to 2020, as a priority for the benefit of the poorest and most vulnerable countries, 100 billion dollars in public and private finance – part of which will be channelled through the Green Climate Fund.

More generally, we must put in place the rules and incentives for a radical redirection of public and private financial flows towards a low-carbon economy. Positive signs do exist but once again they need to be amplified further. At a time when rating agencies are beginning to take the financial aspects of "climate risk" into consideration, when major investment funds are deciding to divest from coal, when increasing numbers of leaders are considering practical ways to ensure more funding for innovation, when certain groups in the oil industry are themselves asking for a carbon price to be set, when more and more countries are reducing their subsidies to fossil fuels, this means that things are moving positively in that direction.

The fourth and last pillar – and this is a novelty in climate negotiations – is the mobilization of non-State actors: local government, private enterprise, non-profit associations, civil society. What we have termed the "Agenda of Solutions". Since the New York Summit held in September 2014 by the United Nations Secretary General, more and more actors are developing "exemplary" climate initiatives. COP20 in Lima last December put forward a "Lima-Paris Action Agenda".

Photo: © Foreign and Commonwealth Office

LAURENT FABIUS,

French Foreign Minister, COP21 President

CONNECTED LIGHTING: A TIPPING POINT IN THE FUTURE OF SUSTAINABLE CITIES

A universal switch across the world to LEDs would slash the amount of electricity used for lighting from 19% to 11%, cutting energy costs and freeing up funds that could be spent in other areas.

By Harry Verhaar

Hindsight is a wonderful thing. How many of the world's problems could have been avoided had those with power and influence yesterday known what we do today?

The ignorance of our forebears makes their errors easier for us to stomach. But the judgment of future generations will not be as kind if they discover that our inaction in tackling many of the greatest threats to the planet stemmed from negligence.

When it comes to energy and climate change, the world faces a perfect storm – a storm that can be diffused, at least in part, by technologies that already exist. And yet, in spite of these solutions, the world is not acting fast enough, and so risks sleepwalking towards disaster.

Cities today account for 54% of the global population and consume more than 70% of the world's energy supply. With urban population predicted to close to double by 2050, the impact of cities on energy consumption, natural resources and greenhouse gas emissions will rise further still. This means that we must focus on making cities more sustainable and grasp the solutions already at our disposal to increase energy efficiency.

Universal switch

Lighting is a case in point where huge savings – both in energy and money terms – can be made using existing technology, with tangible knock-on benefits for the environment, economy and society. Lighting accounts for 19% of all electricity used globally as we cling to outdated, inefficient systems.

Philips has renewed the street lighting system of Szczecin in Poland with connected LED technology. Photo: © Philips.

However, a universal switch across the world to LED lighting would slash this figure to 11%, drastically cutting energy costs and freeing up funds that could be spent in other areas – such as health and education – to stimulate economic growth and create jobs. It would also cut carbon emissions by 670 million tonnes.

While the contributions of every household can help make this a reality, the biggest gains hinge on the decisions of governments, policymakers, businesses, and other large organizations. And, given their scale, cities hold the key.

Street lighting is the obvious starting point. There are 290 million street lights around the world – most of them in cities – and yet only 10% are LEDs. Switching from conventional street lighting to LEDs can cut energy consumption by 40%.

Cost savings

Cities can go even further: by connecting LEDs to enable remote management – and provide light only on demand – energy savings of up to 70% can be achieved. Just 1% of the world's street lights are currently connected, yet this is where the real gains can be

made both in cutting energy consumption and costs, and in improving the way cities function.

Connected lighting systems allow each street light to be remotely monitored and controlled individually, meaning city managers can tailor the lighting to suit the specific needs of each location. From a cost-saving perspective, this means lights can be dimmed or switched off at times and in places when they are not required. It also lets city managers see in real time where there are faults, thus reducing maintenance costs and improving operational efficiency.

These attributes also help cities run more smoothly, as controllers are able to raise lighting to improve visibility on demand, such as in the event of road accidents, peak traffic periods, poor weather, or outdoor events. This not only empowers cities to make smarter use of their lighting infrastructure but also delivers a greater sense of safety and security to citizens walking the streets after sunset.

Global appeal

This technology is just as applicable to the growing number of megacities as it is to villages. Bustling metropolises such as Buenos Aires, mid-sized cities like Szeczin in Poland, and small hilltop towns like Città Sant'Angelo in Italy are all benefitting from upgrading to connected LED street lighting systems.

It's also possible for those cities that pioneered LED street lighting to unlock their full potential by making older LED fixtures connected. Los Angeles has just overcome this hurdle through mobile and cloud-based technologies from Philips, without the financial burden of upgrading to modern LEDs.

Adoption of these kind of technologies must become the norm rather than the exception, if cities are to make meaningful energy efficiency improvements. The environmental argument for taking action is the most compelling, and has been well documented. But the social and economic case is often overlooked and demonstrates that improving energy efficiency does not translate to austerity. Recent research suggests that roughly doubling the annual rate of energy efficiency improvement from 1.3% to 3% would create some 6 million new jobs by 2020 – 1.2 million of them in Europe. Furthermore, it would also cut the world's energy bill by more than £1.5 trillion by 2030.

Such ambitions need not be pipe dreams – especially when the solutions are there for the taking. As 25,000 delegates from governments, UN agencies and NGOs convene in Paris for COP 21, world leaders must put a stake in the ground to drive faster, decisive action to combat climate change. That means setting more ambitious goals for energy efficiency and implementing processes to achieve them. Government regulatory bodies must be prepared to set high but attainable energy standards for buildings and lighting in streets and other public places.

We have a responsibility to see these pledges through, and the clock is ticking. Every day, the global population has risen by close to 200,000 people; the same number have moved to a city; the world consumed 60 billion kWh of electricity; and 30 million tons of carbon dioxide were pumped into the atmosphere.

The time to act is now if we are to retain any shred of credibility among future generations. We have the benefit of both knowledge and technology to reverse these trends – it's now up to us to break the inertia and apply them for the collective good of the planet.

http://lighting.philips.com

Harry Verhaar is head of Global Public & Government Affairs for Philips Lighting.

PHILIPS

Back to the future. Philips has equipped three historic Italian towns with state-of-the-art connected LED street lighting. Città Sant'Angelo shown here. Photo: © Philips.

SOUTH AFRICA'S ROAD TO COP21 AND THE 2015 CLIMATE DEAL

Towards the development of the Intended Nationally Determined Contributions: an analysis of South Africa's evolution from understanding of climate change and policy development to transformation and implementation.

The Department of Environmental Affairs is mandated to ensure the protection of the environment and conservation of natural resources, balanced with sustainable development and the equitable distribution of the benefits derived from natural resources.

In its quest for better use and management of the natural environment, the Department of Environmental Affairs (DEA) is guided by its constitutional mandate, as contained in section 24 of the Constitution. DEA has a climate change branch that is aimed at improving air and atmospheric quality, lead and support, inform, monitor and report efficient and effective international, national and significant provincial and local responses to climate change.

Building resilience

The department's response to climate change is aimed at effectively managing inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.

In the international space South Africa is willing to make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

Policy evolution

In 2011 South Africa hosted the 17th Conference of the Parties (COP) to the UN climate convention. Held in Durban, the meeting was instrumental in building trust in the climate negotiations after Copenhagen in 2009.

It was at this conference that the Ad Hoc Group on the Durban Platform for Enhanced Action (ADP) decided to launch a process to develop a protocol, another legal instrument or an agreed outcome with legal

COP 17 Legacy project

Minister Molewa

force under the Convention applicable to all Parties.

In the same year South Africa developed a Climate Change Response White Paper, marking the beginning of the development of strategies to address adaptation and mitigation, as well as the establishment of monitoring and evaluation processes.

This White Paper presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society.

Implementation
In November 2014, the Department of Environmental Affairs organised a National Climate Change Response Dialogue. The Dialogue consolidated South Africa's vision and common purpose for an effective climate change response and a just transition to a climate resilient and low carbon economy and society.

It provided an opportunity to celebrate progress, and reflect on the achievements since 2011. Against the backdrop of the 5th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). The Dialogue further strengthened South Africa's position in the international arena with regards to preparation towards the Paris 2015 negotiations.

This was also a platform to initiate a broader public consultation on South Africa's Intended Nationally Determined Contributions that should be submitted before COP21 in Paris in December 2015.

South Africa's INDC
The Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) at the 2013 UN summit in Warsaw (COP 19) decided in decision 1/CP.19 paragraph 2 (b) to invite all Parties to initiate or intensify domestic preparations for their intended nationally determined contributions (INDC).

This was to be without prejudice to the legal nature of the contributions, in the context of adopting a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties towards achieving the objective of the Convention as set out in its Article 2 and to communicate them well in advance of the twenty-first session of the Conference of the Parties (by the first quarter of 2015 by those Parties ready to do so) in a manner that facilitates the clarity, transparency and understanding of the intended contributions, without prejudice to the legal nature of the contributions.

South Africa's commitment to addressing the challenge of climate change is based on science and equity and its national response considers both development and climate change. South Africa is acting in response of the findings of the Intergovernmental Panel on Climate Change (IPCC) that warming of the climate system is unequivocal, and understanding that further mitigation efforts by all are needed to avoid high to very high risk of severe, widespread and irreversible impacts globally.

Peak and decline
In this context, South Africa submits its intended nationally determined contribution (INDC) on adaptation, mitigation and support for both. South Africa's contribution to the collective challenge is framed by both its National Development Plan (NPC 2012) and its National Climate Change Response White Paper that reaffirm SA's "peak, plateau and decline" emissions trajectory for mitigation and adaptation needs in the context of agreed temperature goal that does not lead to dangerous anthropogenic interference.

Under mitigation South Africa reiterates that it will take nationally appropriate mitigation to enable a 34% deviation below the 'Business As Usual' emissions growth trajectory by 2020 and a 42% deviation below the 'Business As Usual' emissions growth trajectory by 2025. The action will be implemented depends on the provision of financial resources, the transfer of technology and capacity building support by developed countries.

South Africa's Minister of Environmental Affairs Edna Molewa and Ban Ki-moon. Photo © UN photos

South Africa Environmental Affairs Ministry

Introduction and background
The Department of Environmental Affairs is mandated to ensure the protection of the environment and conservation of natural resources, balanced with sustainable development and the equitable distribution of the benefits derived from natural resources. In its quest for better use and management of the natural environment, the Department of Environmental Affairs is guided by its constitutional mandate, as contained in section 24 of the Constitution.

The Department of Environmental Affairs fulfils its mandate through formulating, coordinating and monitoring the implementation of national environmental policies, programmes and legislation. In 2009 President Jacob Zuma announced the establishment of the new Department of Environmental Affairs from the former Department of Environmental Affairs and Tourism. The department is led by Minister of Environmental Affairs Edna Bomo Molewa, Deputy Minister Barbara Thomson and Director-General Nosipho Ngcaba.

Mandate and core business
The mandate and core business of the Department of Environmental Affairs is underpinned by the Constitution and all other relevant legislation and policies applicable to the government, including the Batho Pele White Paper. The Department's programmatic areas are:

Administration (Chief Operations Officer);
Air Quality and Climate Change,
Biodiversity and Conservation,
Chemicals and Waste Management
Environment Programmes (encompassing the Expanded Public Works Programmes),
Environmental Advisory Services.
Financial Management Services,
Legal Authorisations and Compliance, and
Oceans and Coastal Research.

Vision
A prosperous and equitable society living in harmony with our natural resources.

Mission
Providing leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the global community.

Values Statement
In 2011, DEA adopted its five new values, namely Passion, Pro-Active, People-centric, Integrity and Performance. Driven by our Passion as custodians and ambassadors of the environment we have to be Proactive and foster innovative thinking and solutions to environmental management premised on a People-centric approach that recognises the centrality of Batho Pele, for it is when we put our people first that we will serve with Integrity, an important ingredient in a high Performance driven organisation such as ours.

Entities reporting to the Minister are:
South African Nation Parks, South African Weather Service, South African National Biodiversity Institute & the iSimangaliso Wetland Park Authority.

www.environment.gov.za

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THE ROAD TO COP21 IN PARIS

A sense of global optimism has been fostered in the lead up to COP21. International climate negotiations are in much better shape than in the run-up to the Copenhagen conference, and this is mainly because there is less emphasis on a legally binding treaty. Chances of success at the Paris conference are higher than before with more active engagement from both the United States and China. Now, efforts need to be taken to strengthen the political will on climate change and find realistic approaches to resolve the political issues through dialogue. The Paris conference itself would then be about removing any obstacles and celebrating its success.

Four key elements are needed to increase the chances of a successful climate deal in Paris. The first is for all countries, whether rich or poor, large or small, to commit to clear action on climate change. The second is to ensure that they all pledge to incorporate their commitments into national law. The third is to regularly review all efforts to deliver on the Paris outcome, while the fourth is to agree on robust financing in support of developing countries' efforts. In Paris, countries are likely to make choices to act to tackle climate change based on their national interest. Unlike in Copenhagen where the talks focused on binding commitments, countries now volunteer targets to reduce pollution and deal with global warming. This is an encouraging sign of countries' shared commitment to achieve a positive outcome in Paris.

Compared to five to 10 years ago, we are putting the debate much more in the context of an economic model that works to address global challenges. This is important because the primary objective for many developing countries is economic growth and poverty eradication. The time when developing countries thought of environmental issues as something only the North needed and could afford to worry about is well behind us. A number of trends are driving this. Global issues, such as climate, energy, food, water, material prices and the impacts of aging, urbanization and wealth increase are all affecting the economic, social and environmental prospects of countries around the world.

One critical issue at COP21 will be climate finance for supporting developing and emerging countries, and investing and financing the new low-carbon technologies. First, developed countries need to take steps to show commitments to support developing countries through public finance. The role of the private sector is also critical. Greater emphasis needs to be placed on using public finance to leverage private capital and build policy incentives for directing private finance to developing countries. Second, increasing political commitment to environmental issues is essential. A lack of political interest is leading to budgetary and institutional limitations in the context of climate change. The contribution that green growth could make to strengthen economic growth and poverty eradication is not at the core of the high-level political debate in many countries. It is important for governments to realize that the transition to a green pathway is becoming financially viable and there is a need to provide frameworks for green growth that can lower policy barriers. Third, technology, at present, is not making its way into the market to effectively assist developing countries. This is partly because the costs are too high, the risks are too great or the markets are too small. These are a set of challenges faced by investors. Besides this, developing countries don't have an adequate understanding of the technologies that are available and how, and in what ways, those technologies could be applied to their countries. So it is essential to create a conducive regulatory environment for technology transfer and to build the necessary capacity to deploy it. Last, it is critical to develop bankable project proposals that translate environmental propositions into a comprehensible language for investors and take those proposals to the financial institutions that can finance project implementation.

Financial support for developing and emerging economies is important, and in line with an effort to increase their access to climate finance, international organizations and agencies, including ourselves at the Global Green Growth Institute, are helping to develop investment-ready projects. GGGI is conducting 37 programs in 22 countries to support developing nations mainstream the green growth agenda to the forefront of their economic development plans. GGGI also helps countries to develop green growth plans that are "bankable" - projects that meet investor criteria and that will be implemented.

The Paris agreement will not fully bring us to achieving the two degree target, but it will put us on track to begin the process to reach that goal. Therefore, it is essential for the global community to meet every three years or so to review progress on the promises, and if necessary agree on further actions. Back in 2009 in Copenhagen, expectations were too high and unclear. Six years on, there is more clarity on what the Paris conference should deliver, and when expectations are more within the realm of possibility, there's a better chance of achieving results.

Mr. Yvo de Boer is the Director-General of the Global Green Growth Institute (GGGI), a Seoul-based international organization. Established in 2010, GGGI is a member-based international organization founded to support developing and emerging countries in the transition to greener, sustainable and low-carbon economies. GGGI works with governments to help them achieve their growth goals of real inclusive and sustainable change for their people and the environment.

Photo: © www.iisd.ca

YVO DE BOER, *Director-General, Global Green Growth Institute*

JOSS GARMAN: WHAT DOES A SUCCESSFUL PARIS CLIMATE DEAL LOOK LIKE?

If governments do not agree what is necessary to stay below the 2C threshold, will the Paris summit have been a failure?

David Cameron's energy and climate change secretary Amber Rudd has identified the job at the Paris meeting as being 'to keep the global two degrees goal within reach'.

John Podesta – the architect of President Obama's climate reforms and the man now running Hillary Clinton's bid for the presidency – has similarly identified the task as being 'to give leadership and credibility to that effort'.

To this end, it can be argued that the UN climate process has already been a success. The road to Paris has already prompted promises from countries around the world that very probably would not otherwise have been made, and certainly not within this timeframe.

Establishing the confidence and conditions required to enable each country to do more than it would do otherwise is what climate diplomacy, and these talks, are all about. While the 'ambition gap' on emissions will not be closed altogether at the Paris summit, the result of the pledges made already is that the global carbon pollution curve should at least begin to bend in the right direction.

Over the last few months, as a consequence of these international talks, we've seen a stream of announcements from rich and poor countries – from Gabon and Andorra to China and the United States – putting in place new goals for cutting the output of greenhouse gases and moving onto a more sustainable development path.

These targets have often been made binding through national laws like the UK's Climate Change Act. Almost 500 climate laws have already been passed in 66 countries that together account for 88 per cent of global emissions.

Policy progress

Alongside these laws come new schemes to actually implement decarbonisation plans by driving change in the real economy. These are the means by which the headline carbon targets that politicians agree nationally and internationally will intersect with global capital flows and drive the shift away from fossil fuel use and towards the alternatives.

These mechanisms will take many forms, including clean energy subsidies, efficiency standards for cars and buildings, carbon taxes, and reductions in financial support to incumbent fossil fuel industries.

For example, following intensive talks with the US, the commitment that China has made through the UN process will require the country to deploy an additional 800–1,000 gigawatts of nuclear, wind, solar and other zero-emissions generation capacity by 2030.

This amount is equivalent to more than all the coal-fired power plants that exist in China today, and close to total current electricity generation capacity in the US. Beijing's pledge to peak China's national emissions before 2030 will also require new policies to ensure a structural shift away from burning coal.

Locked in?

Similarly, to meet the carbon target Obama announced, the US will need to continue its shift away from coal-fired power generation and improve the efficiency of the nation's cars and trucks.

The binding nature of America's new national carbon rules, the authorisation granted for them by the Supreme Court, and the effect that they're already having on state-level regulations and investment flows, together mean that the direction of investment towards cleaner and more efficient technologies is now established and likely to stick.

Even in the event that a sceptical Republican administration took control of the White House in 2016 and sought to deliberately slow the pace of the transition, Obama's reforms mean some climate progress is now locked in.

The varying political economies across, and even within, different countries and regions – typified by the opposition to climate policies from the US Congress, and the well-known power of the dominant industries within that country – partly explains why the Paris summit will never result in a global harmonised carbon-pricing regime of the kind many economists and some major energy companies have often advocated as their favoured response to the climate crisis.

Nor will governments agree a science-based global carbon budget that assigns top-down targets to countries and is wholly ratified in international law – something that has been the long-held wish of many campaigners.

The outcome of the multilateral process will instead be a patchwork of national and regional arrangements that are rooted in the realities

of what each government has deemed possible and favourable in their part of the world.

Financing change

So what remains to be decided? For the conclusions of the Paris talks to be seen as credible, at the very least leaders still need to clarify that their shared goal is to phase out unabated fossil fuel use entirely within the next century.

The gap between this extraordinarily challenging aim and what the world is likely to agree to in the short to medium term means that it will also be crucial that leaders decide upon a means by which collective ambition can be ramped up in future – until the job is done and climate safety is secured.

This will require new measures that will align international aid and private financial flows with these objectives, and stop investments into dirty energy infrastructure that could otherwise put these aspirations beyond reach.

The draft UN text for Paris contains the necessary clauses that, if agreed, could secure precisely this kind of package. G7 leaders recently supported a total phasing out of all unabated fossil fuel use over the course of this century. Some emerging economy leaders, such as President Rousseff of Brazil, have offered their support to this goal too.

If in Paris other world leaders were to sign up to this ultimate objective it would provide a landmark in the talks and set a benchmark against which all current and future policies could be judged.

Regular reviews

The US and many African and Latin American countries are advocating a mechanism that would require each party to the agreement to revisit and resubmit its national plans to the UN every five years. This could draw regular and worldwide attention to the climate ambition deficit.

As the cost of clean technologies continues to fall, and as technology improvements make deeper carbon reductions increasingly feasible and affordable, this sort of approach would provide a regular opportunity to capture this increased potential and ratchet up the international effort over time.

Of course, everybody also wants the agreement to give confidence that countries will deliver what they promise. The US won't do anything without China taking verifiable steps, and vice versa; similarly, climate policy advocates here in Britain will be all too familiar with those critics who have long argued that our efforts are pointless unless we can know that more is happening in the 'G2'.

For these reasons, clinching agreement on a stronger set of common rules for how to account for different kinds of greenhouse gas pollution and how to check that emission reductions are actually happening will be essential for the deal to have real integrity.

Without rules like these it could prove very difficult, even impossible, to compare one country's climate commitments to another's, or to compare the world's collective effort against what is required.

Market signal

Finally, if developing countries are to avoid the polluting growth pathway that industrialised countries have historically followed – a pathway based on deforestation and the burning of polluting fuels like oil coal and gas – then aid flows will need to support cleaner development opportunities, as well as adaptation activities such as the construction of sea walls and the hurricane-proofing of schools.

Photo: © Joe de Sousa I www.flickr.com

The Paris summit must also send a sufficiently strong market signal to businesses that the private sector more widely begins to align its investments into the kind of profitable projects that will complement rather than undermine the wider climate effort.

Given that addressing the carbon problem requires wholesale transformation of the global energy economy to shift trillions of pounds into less polluting energy and transport infrastructure, and into more sustainable forestry and agricultural practices, it is hardly surprising that it should take more than a couple of UN summits to realise.

As President Obama described in a recent interview in the New York Times: 'It's not going to happen as fast or as smoothly or as elegantly as we like, but, if we are persistent, we will make progress.'

The Paris summit should mark a milestone in that progress, but only insofar as the discussions and agreements made there will lay the foundations for what happens next.

Much more than the road to Paris, it is the road from Paris and the pace of the changes that are wrought in the real economy over the coming decades that will ultimately determine whether or not humanity manages to avoid the most dangerous impacts of our fossil fuel dependence.

Joss Garman is associate director for climate change, transport and energy at the left of centre UK think tank IPPR. Follow him on twitter @jossgarman

This article first appeared on the IPPR website.

TERRIFYING MATH: HOW CARBON TRACKER CHANGED THE CLIMATE DEBATE

For decades fossil fuels were seen as a safe bet – until one simple study by a team of fund managers in 2011.

By Ed King

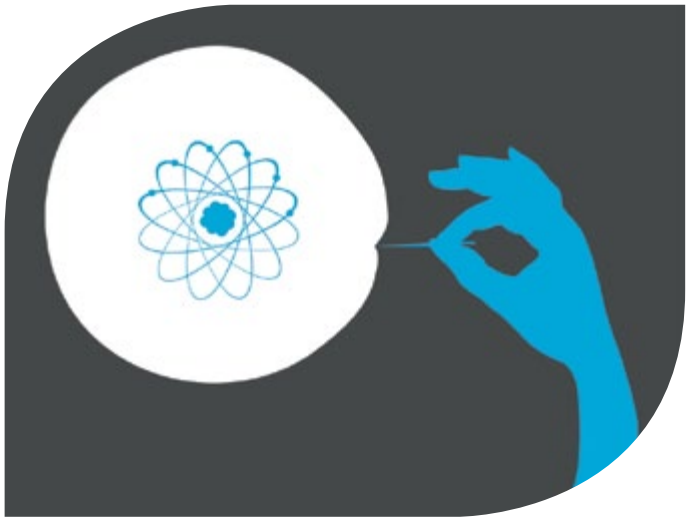
"I think it's a bollocks subject. I'm not interested in this kind of subject. I think this is complete hot air."

This was the fruity view of an oil and gas trader in 2011, when asked to comment by the FT on a study suggesting fossil fuel reserves could become stranded assets due to new climate laws.

Not so long ago the idea oil, gas and coal companies could be wildly overvalued and at risk from future greenhouse gas cutting regulations was greeted with scorn.

Roll on four years and the 'Unburnable Carbon' report by the Carbon Tracker Initiative – a group of ex-fund managers, oil analysts and lawyers – has big oil running scared.

These scions of capitalism were even embraced by anti-capitalist protestors, who carried a giant inflatable silver and black ball representing the 'carbon bubble' of assets that cannot be used through the streets of New York ahead of the 2014 UN climate summit.



In 2011, the Carbon Tracker Initiative launched its seminal 'Unburnable Carbon' study, warning many assets were over-valued.
Photo: © Carbon Tracker.

The bubble eventually burst in Wall Street, on the horns of the Merrill Lynch bull.

The world's top oil, gas and coal majors have long resisted pressure from environmentalists to take climate change seriously.

For years, many bankrolled climate denial campaigns, secretly lobbying governments to water down green laws while investing heavily in exploring new reserves across the planet.

"The [climate] models aren't that good," Exxon-Mobil chief executive Rex Tillerson told shareholders earlier this year. Peabody Energy CEO Greg Boyce spun a similar line to his investors.

The science is "flawed", he said. The supposed climate crisis was a mirage.

Historically generous dividends from fossil fuel investments once insulated chief executives like Tillerson and Boyce from criticism. Shareholders knew they were on a winner.

That confidence has started to wane, cracked by the collapse in global oil prices and the implosion of the US coal industry.

Amid the financial carnage, the Carbon Tracker Initiative (CTI), a small London-based NGO, started to create headlines the fossil fuel giants dreaded. The slump was not a one-off, it warned. Oil, gas and coal were no longer the safe bets of old.

Mark Campanale is not your typical tree hugger, favouring expensive suits over hessian shirts. After dabbling in green activism at York University in the early 1980s, the founder of CTI became a fund manager, working his way through Jupiter Asset Management, AMP Capital and Henderson Global Investors.

Few were interested in his theories about the risks associated with high carbon investments. But Campanale had tracked US coal stocks throughout the 1990s and early 2000s and was convinced they were overpriced.

He had at least one angry argument on the Henderson trading floor with a "very senior fund manager" who dismissed his concerns. This, he tells RTCC, was not unusual.

"The city is populated with people who… it's not that they can't get it – it's that they don't want to get it. My own experience of talking to mining and oil analysts at Henderson where I worked was their struggle with the idea you couldn't burn all the fossil fuels. That was incomprehensible."

Attempts to take his theory to other investor friends in the City were rebuffed. "Even some of the top sustainability folks would not sit down and discuss it. They just weren't interested in it."

The idea there is a finite amount of carbon dioxide that can be emitted was born off the back of the 2010 UN climate summit in Cancun, when countries formally committed to limiting warming to 2C above pre-industrial levels.

The Potsdam Climate Institute calculated that for a 20% chance of avoiding this ceiling, a maximum of 886 billion tonnes (GT) of carbon dioxide could be released by 2050.

That meant little to the general public, but the 'Unburnable Carbon' report spelt out its consequences for fossil fuel companies. It said only a fraction of the carbon in the world's fossil fuel reserves – 2860 GT CO2 – could be used if countries were serious about meeting the 2C goal.

In a stroke, the CTI rendered the majority of reserves held by the likes BP, Shell, Exxon, Chevron and Peabody unburnable, posing a direct challenge to their business models.

"We knew that when you have a cap there would be a catfight about who could burn fossil fuels and not everyone would be winners. That gave reason for fund managers all around the world – Australia, Canada, America, Europe and Scandanavia – to start challenging companies," says Campanale.

The tiny CTI research team thought the report would be the end of it. Campanale even missed the launch to take his kids to the Latitude music festival. Quite the opposite.

The 31-page report caused a stir across the city. An old friend in a law firm called to cancel an appearance at a mini-launch – its findings were toxic.

"The significance hadn't dawned until we tried to launch it at a few law and accounting firms and we faced huge resistance," says Campanale.

Instead, support came from a wholly unexpected angle, in the form of veteran climate activist Bill McKibben, founder of the 350.org NGO. He was sent the report by fellow campaigner and author Naomi Klein, who was stunned at its implications for the fossil fuel giants.

The CTI's number crunching proved the genesis for one of the most powerful climate essays in the last decade: Global Warming's Terrifying New Math, published in RollingStone magazine on 19 July 2012, authored by McKibben.

"I did base that article, and the subsequent divestment campaign, on CTI's numbers," he tells RTCC in an email.

"Those numbers have helped the world understand the contours of the greatest problem we've ever faced. Without their math we wouldn't understand the momentum we must somehow stop to have a chance with climate change."

Photo: © Bryan Elder l www.flickr.com

The article was the "most poetic, brilliant piece of writing I've ever read," says Campanale.

McKibben used it to unleash a new wave of activism at universities across the US in late 2012, encouraging students to demand their colleges ditch holdings in fossil fuels. By the end of 2013, there were 400 campaigns underway across the world.

By September 2014, the heirs of the Rockefeller oil fortune had offered support to a $50 billion divestment drive.

By December 2014, the UK's energy chief Ed Davey was in on the act, warning pension funds with high carbon assets were at risk. Shell UK's CEO complained about his comments.

It was too late – the genie had been unleashed.

As of August 2015, 349 institutions including the Norwegian Sovereign Wealth Fund, Stanford University and the Church of England have announced plans to ditch some or all of their fossil fuel holdings.

World Bank chief Jim Kim and the UN climate body have thrown their weight behind the movement.

Perhaps of equal significance, the CTI data encouraged the Guardian newspaper to launch its 'Keep it in the ground' campaign in March this year.

"There are trillions of dollars worth of fossil fuels currently underground which, for our safety, simply cannot be extracted and burned. All else is up for debate: that much is not," wrote editor Alan Rusbridger.

Faced with an innovative attack on their business model, oil companies got on the defensive.

War on bubble

In March 2014 Exxon wrote to shareholders denying there was any risk to its operations. "We are confident that none of our hydrocarbon reserves are now or will become stranded," the company said. Shell followed two months later with a similar note reassuring investors, stressing transformation "will inevitably take decades".

A July 2014 investigation by the Carbon Brief saw BP, Conoco Philips and Statoil line up to dismiss the threat of a carbon bubble, while US consultancy IHS ran a specially commissioned "deflating the bubble" series.

CTI chief executive Anthony Hobley was delighted with their response, even if he feels they failed to offer satisfactory answers to the core analysis. "It was huge. Whatever they say about you, they have to take you seriously, which shows your underlying analysis is sound. They can't ignore it."

Campanale agrees. "It was thrilling moment that Shell and Exxon took us seriously enough to produce 10 or 20 page letters to try and explain this," he said. A series of replies from CTI branded the oil majors analysis "complacent" and said they understated their risks.

CTI's analysis also exposed the lack of rigour at the heart of energy modelling in the City, Hobley adds. "The 2011 analysis connecting fossil fuel reserves and resources is fairly simple," he says.

"You have got to ask yourself why had this not been done by the major analysts – Goldman Sachs, JP Morgan, Merrill Lynch or analytical firms. To some degree they were lapping up what the energy companies were saying. They're the ones who do the forecasts."

What really gave the CTI credibility was not so much this war of words with Shell, BP and Exxon, but the ruinous state of the US coal industry. Tottering after years of tougher sulphur and nitrogen regulations, coal companies starting going under.

Big names like James River Coal and Patriot Coal Corporation filed for bankruptcy, two of 26 that had gone under in recent years.

"What happened to US coal was the eye opener," said Craig Mackenzie, senior investment strategist at Aberdeen Asset Management. "Suddenly you realised that the general constraint on fossil fuels could be much closer than we thought."

At the same time, oil prices were starting to nosedive from around $110 a barrel to their current level of just under $50, placing high cost plays like the Arctic and tar sands under pressure.

Even media groups frequently hostile to green regulations started to pile in against high carbon investments.

In the FT, Martin Wolff asked if high levels of oil, gas and coal investments could be a "disastrous waste of resources that could be better deployed elsewhere".

In the Daily Telegraph, Ambrose Evans-Pritchard said fossil fuel companies were throwing "good money after bad" and were "courting fate" by dismissing the prospects of a global climate deal in 2015. The Economist labelled the debate the "elephant in the atmosphere".

Enter Carney

What happened next stunned everyone – not least the CTI team. The Bank of England and then the Basel-based Financial Stability Board (FSB) signalled their fears that stranded assets could be more than a theory.

Climate change was one of the "top risks" facing the financial services industry, according to Bank of England governor Mark Carney, who commissioned the One Bank Research Agenda in February and faced down criticism from leading UK climate sceptics for doing so.

And the G20 group of nations seemed equally concerned, asking the FSB to present its findings at this year's summit in Turkey, which takes place two weeks before nearly 200 countries meet in Paris to sign off a long-planned UN climate deal.

The United States, China, India, Russia, Australia, and Saudi Arabia have all agreed to carry out internal stress tests, evaluating what the impact of new climate laws would be on the value of their fossil fuel reserves.

Abigail Herron, head of responsible investment engagement at Aviva Investors says the intervention of Carney signalled that stranded asset fears were now a reality. "It's now in the mainstream investment dictionary," she adds. "Three to four years ago I'd have to explain what stranded assets were and I don't have to do that anymore."

Mike Wilkins, managing director of Standard & Poor's ratings services agrees that its profile has ballooned. "Whether fund managers and others have changed investment decisions as a result of CTI's work is hard to say, but the issue of carbon risk is far more prominent now that it was just two years ago," he says.

Global agreement?

All eyes are now on Paris, venue of the 2015 UN climate talks where a new global deal to limit emissions is set to be signed off by nearly 200 countries.

If successful, that will broadly see leading developed governments agree to cut carbon pollution by around 30% over the next 15 years, and top emerging economies target a gradual slowdown of their emissions – a trajectory Campanale points out is not one forecast by the oil majors.

Already, there are signs of more of the CTI's predictions bearing fruit. Shell's CEO took major shareholders to the tennis at Wimbledon to reassure them their investments are safe, despite what many analysts believe is the company's high-risk Arctic venture.

Weeks later, it was revealed oil majors had written off $200 billion of new projects due to plummeting prices.

Elsewhere, Peabody coal posted $1 billion second quarter losses while Seaborne thermal coal giant Glencore looks set to announce a "calamitous" profit slump this week.

Mackenzie is full of praise for the quality of the analysis CTI has offered but is keen to observe the wide range of factors affecting fossil fuels – and particularly coal.

"It's not a pure carbon story. It's also a SOx, NOx and mercury story." Had they tried this 5 years ago "it probably wouldn't have worked," he argues.

Has the analysis changed the City? Mackenzie, Wilkins and Herron are unwilling to go that far, but all say in terms of awareness raising it has propelled stranded assets into boardrooms previously deaf to these concerns.

Developing focus

Still, it's easy to get carried away with a few quarterly results. Coal use is growing fast in non-OECD countries, rising by nearly 400% since 1990.

Demand may be falling in Europe and the US due to tightening environmental and emission standards but in China, India, Indonesia and the Philippines there are plans for hundreds more coal plants.

That does not invalidate the stranded assets theory, but it does highlight the urgency for developing countries to receive help sourcing cleaner forms of energy over the next decade.

New copies of the CTI's work are to be published in several languages – including Chinese and Japanese – in a bid to widen the debate to South East Asia and the Far East.

Emerging economies with a lust for high growth may prove tougher nuts to crack, but Campanale's journey over the past two decades has demonstrated to him that provided with credible and clearly presented information, shareholders can move mountains.

"The divest movement has mobilised thousands of little endowments and charities to challenge fund managers who have to go back and ask questions of companies," he says.

"They have never come into the climate debate before but now they're coming in on the side of the right outcome… that being an orderly [low carbon] transition because it's the right thing for policyholders.

"There is no fiduciary duty to make the planet uninhabitable."

Photo: © Annette Bernhardt | www.flickr.com

WORKING TOGETHER TO ACHIEVE OUR SHARED GOAL

Philip Morris International Inc.'s (PMI) Head of Environmental Sustainability, Andrew Harrop, talks about the UN Framework Convention on Climate Change COP21 meeting and what it means for PMI.

Global leaders are meeting in Paris to work on an ambitious but necessary agreement to tackle climate change. While differences may exist on how to achieve our shared goal, there is converging alignment on what needs to be done: a substantial and sustained reduction in greenhouse gas emissions to keep global temperature rise to under 2°C from pre-industrial levels.

Playing our part
As the leading international tobacco company and a Fortune 500 business, at PMI, environmental sustainability has always been a key part of how we operate and our culture.

Climate change is a huge global challenge and we understand the need to collaborate with stakeholders and peer organizations to better face this societal issue together. With PMI brands sold in more than 180 countries worldwide and a global workforce of more than 82,000 employees, we are cognizant of our corporate footprint and are stepping up to take action, seizing the opportunities that come with the size and scale of our value chain.

From the fields of half a million tobacco farmers in more than 30 countries, to our 50 factories worldwide, right up to the distribution and logistics, to retailers, and our consumers, environmental sustainability is core to their path, and ours, for long term success.

Putting our house in good order
PMI has established ambitious emission reduction targets which include a long-term commitment to a 20% reduction in fossil-fuel related energy and CO2 emissions from our factories by the end of 2015, and a 30% reduction in our carbon footprint across our whole value chain by 2020.

In 2014, through the use of greener energy in our EU-based factories, we reduced the annual carbon emissions from our operations by 10%, or 80,000 metric tonnes, the company's single largest annual reduction achieved to date and putting us in a strong position to achieve our 2015 target.

Reporting on progress
We regularly report on our progress via CDP, an international NGO committed to promoting public disclosure of organizational carbon reduction and management. The CDP ratings provide a tool for institutional investors and stakeholders to assess corporate efforts to mitigate climate

** Against a 2010 baseline, per million units of product equivalent.*

Philip Morris International Inc. (PMI) is the leading international tobacco company, with six of the world's top 15 international brands, including Marlboro, the world's best-selling cigarette brand, and with international and local brands sold in more than 180 markets. PMI's goal is to provide high quality, innovative products to adult smokers. We aim to reduce the harm caused by smoking by supporting effective evidence-based regulation of tobacco products and through our investment in developing products with the potential to reduce the risk of tobacco-related disease.

change. In 2015, PMI was awarded climate 'A List' status in CDP's Climate Performance Leadership Index and received top marks with 100% for Carbon Disclosure.

Broader sustainability and value chain cooperation

Our sustainability efforts include working closely with partners across our value chain to achieve our goals. Following an internal assessment of our entire carbon footprint, we found that more than 70% of our carbon emissions come from our supply chain, including up to 40% from tobacco agriculture. As a result, a key part of our carbon emission reduction strategy is to support farmers on improving Good Agricultural Practices[1].

It's not only on carbon reduction that we take bold action. We have also set a target of 20% reduction of our water consumption in our factories, and engage our agricultural supply chain on water stewardship. And, we're working to further reduce waste from our operations having achieved a recycling rate of 85% in 2014[2], with efforts now focused on minimizing waste to landfill.

A critical time: let's work together

We believe that an ambitious deal at the outcome of COP21 is critical to limiting the impact of climate change on the

1 For more information on our Good Agricultural Practices, please visit: http://www.pmi.com/eng/sustainability/good_agricultural_practices/pages/good_agricultural_practices.aspx
2 Read more about our broader environmental sustainability work at: http://www.pmi.com/eng/sustainability/pages/environmental_performance.aspx
3 To read the CDP "Road to Paris" Manifesto click https://www.cdp.net/en-US/Pages/commit-to-action.aspx and "We Mean Business" Coalition, visit: http://www.wemeanbusinesscoalition.org/

planet, and we support an international agreement between governments to achieve that.

Following our good progress on carbon reduction, we are now setting our own science-based targets and support the CDP "Road to Paris" and "We Mean Business Coalition"[3] as part of these efforts.

We know that success depends on many groups of stakeholders working together - businesses, organizations, governments, and individuals. We recognize our responsibility to "do well by doing good" – the so-called "shared value" concept. PMI remains strongly committed to playing our part to achieve long-term sustainable business growth.

www.pmi.com

PHILIP MORRIS INTERNATIONAL

MEET THE CLIMATE SCIENTISTS RUNNING AND CYCLING TO PARIS

Daniel Price and Erlend Knudsen are travelling from the ends of the Earth to spread awareness of climate change ahead of critical COP21 summit.

By Megan Darby

For Daniel Price, the toughest stretch was cycling across the Gobi Desert. For Erlend Knudsen, it was running through a two-day snowstorm in the mountains outside Bergen, Norway.

Their journeys are not over. These two polar researchers have swapped physical science for physical exertion, on a mission to spread awareness of climate change.

They are on twin odysseys from the Arctic and Antarctic to Paris, France, where diplomats meet to strike a global climate deal in December.

"Following the discourse on climate change becomes increasingly frustrating when you are a scientist," Price tells Climate Home from Salzburg, Austria.

"There is this huge segment of society that doesn't care or understand. I realised my parents didn't even know what COP21 [the 21st Conference of the Parties in Paris] was and my friends really didn't understand the urgency of it either.

"That was the motivation to communicate the problem in a new way."

Price finished his doctorate studying Antarctic sea ice last year and thought of breaking out of the academic bubble.

He Skyped his friend Knudsen, who was in a similar situation on the other side of the world. The pair had met at a summer school in Svalbard, a rugged Norwegian outpost in the Arctic Ocean, four years ago.

Knudsen says: "As we got to the end of our PhDs, we both felt we were spending too much time in our offices and not enough time communicating our research. Independent of each other, we both had the same kind of mindset about that."

It is a common gripe among climate scientists that their warnings about the gravity of the problem are not translating into urgent action.

Between 90 and 97% of relevant experts agree human activity is the main driver of global warming, various studies have found. Yet most

lay people are either unaware of climate change or misjudge the level of consensus.

In developing countries like India, Bangladesh and Egypt, some two thirds of people have never heard of the problem, according to Gallup data.

In the rich world awareness is higher, but citizens perceive the evidence as more uncertain than it is. Only 57% of US adults think scientists "generally agree" people are making the world hotter, a recent Pew survey found.

Some of the most significant climate impacts are found at the North and South Poles, which are warming faster than the global average.

Melting ice sheets are causing sea levels to rise, posing a threat to hundreds of millions of people living in coastal regions worldwide.

Scholars like Price and Knudsen brave harsh, icy conditions to gather data and sharpen up predictions on the rate of change. Fresh from the frontiers of climate science, they wanted to share that experience with others.

Price would cycle from the South Pole and Knudsen run from the North – or as near as possible – giving talks along the way.

They had a "lucky break" at the start, says Price, when the UN Development Programme (UNDP) signed up as a partner.

"I was coming through all the developing countries. We would put together local stories on climate change issues."

He met government officials in Indonesia to talk about renewable energy and shot a documentary on sea level rise in low-lying Bangladesh.

All along the route, cycling was a hook to get people interested, with 500 bikers joining a demo in Jakarta.

Pole to Paris – spreading the message through the streets of Jakarta. Photo: © Dr. Daniel Price.

Erlend Knudsen runs last stretch to Bergen. Photo: © Oda Eiken / Uni Bjerknes Centre.

"It gives a fantastic platform," says Price. "When I started the project, I thought this journey would work, but I didn't really think how effective it would be with the media."

He hasn't quite cycled the whole way. Rather than skid across the McMurdo ice shelf where he did his fieldwork, Price pedalled off from New Zealand in April.

Russia would only grant a transit visa, allowing enough time to catch the Trans-Siberian Express but not to make it across under his own steam.

And the UNDP collaboration involved some travel back and forth. The pair promised to offset the emissions of unavoidable flights using myclimate.

Those detours aside, Price will have cycled 10,000km by the time he arrives in Paris, covering Australia, Indonesia, Singapore, Malaysia, Thailand, Bangladesh, China, Mongolia and Europe.

Equipped with a British-made Brooks saddle – "a godsend" – he has managed to avoid saddle sores, despite a gruelling schedule.

His longest day was a 250km stretch in the Gobi Desert. Joined by a friend, he covered Beijing to Ulan Bator in nine days.

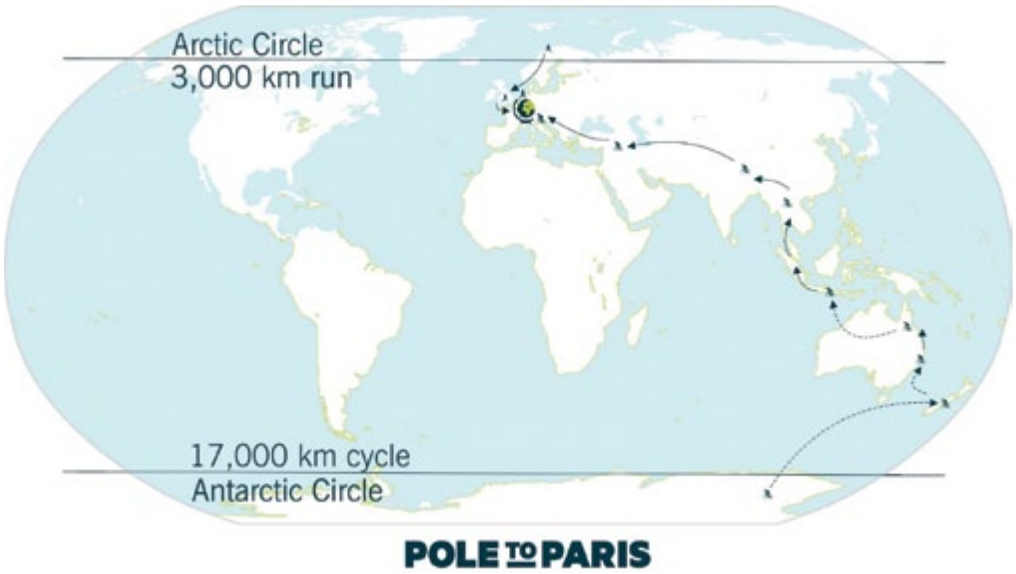
"Now I am thinking it was a little bit insane," Price admits. "We would stop for lunch and set up a tent just to get out of the sun, it was so hot.

"We met nomadic herders with big herds of wild horses. It was brilliant… in that region climate change is pretty apparent, they are struggling with desertification."

In Norway, Knudsen had cold, not heat, to contend with. Setting off from Tromso in August, conditions were summery enough, but he ran into a blizzard outside the southerly city of Bergen a month later.

"That was a bit sketchy," says Knudsen. "It was really slippery, really cold with no visibility. There was no-one else there."

Determined not to use a back-up car, he ran carrying 12-15kg of gear in a pack.



"The toughest thing is the mind part. The thing that made it worth it was the people I met along the way. People took me in and gave me shelter for the night."

Exhausted from the 1,900km stretch, Knudsen passed the baton to friends in the UK, who are running Edinburgh to Cambridge as a relay.

Recruiting volunteers showed some of the limitations of outreach. "It is easier to get people interested in climate change issues to run rather than get runners to run for something other than themselves," he observes.

Knudsen is speaking at schools, universities and conferences in the meantime, before pounding a path from Cambridge to London, then Brussels to Paris.

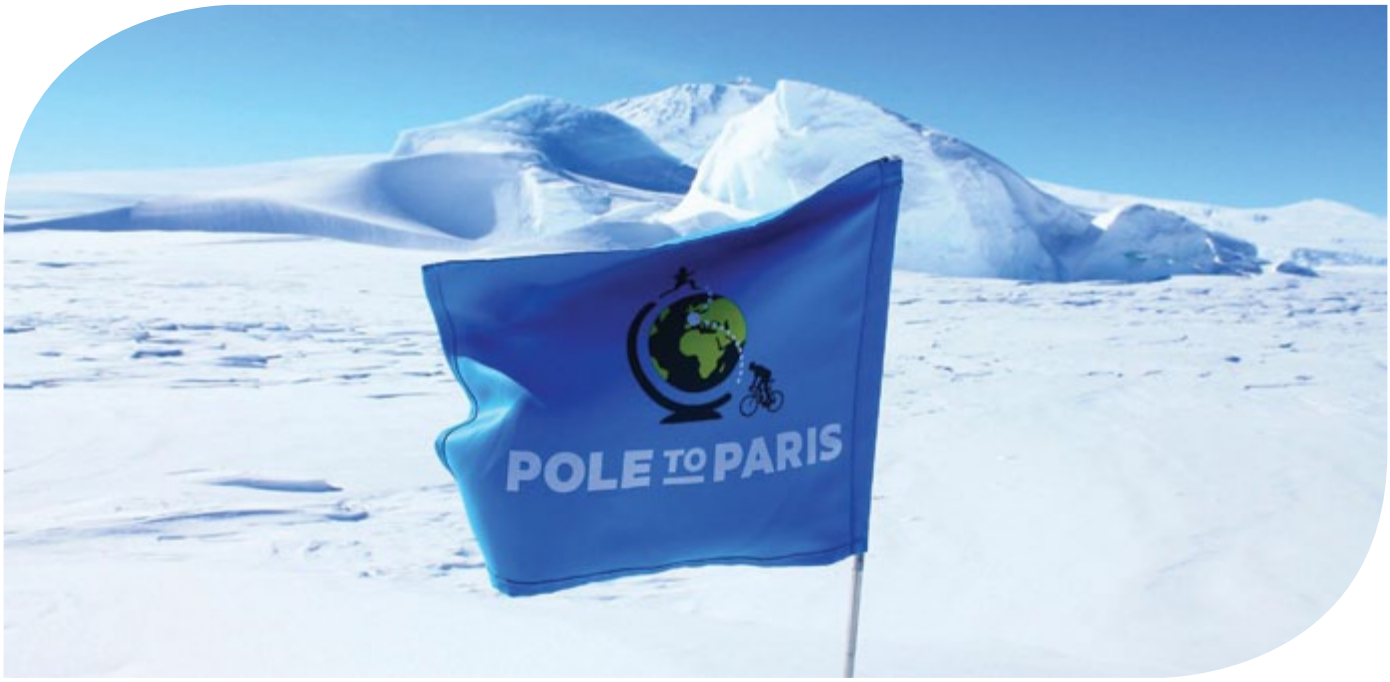
When they get to the French capital, Price and Knudsen plan to hold a side event at the critical climate summit.

For all the alarming implications of their own research, they aim to focus on opportunities to tackle burgeoning emissions.

"We want a positive vibe," says Price, mentioning renewable energy and Tesla's innovations in battery storage.

Knudsen agrees: "We have so many tools already when it comes to charting a path to a sustainable future. We just need to start using them…

"The climate conference in Paris will potentially be a big step in the right direction and a very, very important and needed step. We have waited so long."



THALES: OUR COMMITMENT TO FUTURE GENERATIONS

2015 will likely be a decisive moment in the history of our planet, and the implementation of measures to attenuate the risks entailed by climate change. It will also open new prospects for tomorrow's key space missions that will examine this phenomenon.

A real community has formed around the challenges of climate change, bringing together scientists, government agencies and industry. We have long shared our thoughts and analyses to design increasingly accurate instruments and satellites to measure all essential climate variables as defined in the World Climate Research Program, and give decision-makers the increasingly reliable data they need.

But our engagement in industry goes well beyond this framework, and this collaboration has quickly become a passionate and deeply human story, one to which we seek to contribute the full sum of our skills and expertise.

Three satellites

We are all fully aware today that we must continue to refine our understanding of the Earth's climate, a task that depends on observational continuity and precision long-term models.

In the history of humanity, climate science is still a very young discipline, and while it allows no doubts to linger about the unprecedented disturbance in our climate, there are still a number of uncertainties about climate change. For example, it is important to quickly launch European programs that will measure greenhouse gases, carbon dioxide and methane.

For Thales Alenia Space, 2015 is also a symbolic year,

Sentinel 3. Photo: © NASASpaceFlight.com

ABOUT THALES

Thales Alenia Space, a joint venture between Thales (67%) and Finmeccanica (33%), is a key European player in space telecommunications, navigation, Earth observation, exploration and orbital infrastructures. Thales Alenia Space and Telespazio form the two parent companies' "Space Alliance", which offers a complete range of services and solutions.

Because of its unrivaled expertise in dual (civil/military) missions, constellations, flexible payloads, altimetry, meteorology and high-resolution optical and radar instruments, Thales Alenia Space is the natural partner to countries that want to expand their space program. The company posted consolidated revenues in excess of 2 billion euros in 2014, and has 7,500 employees in eight countries.

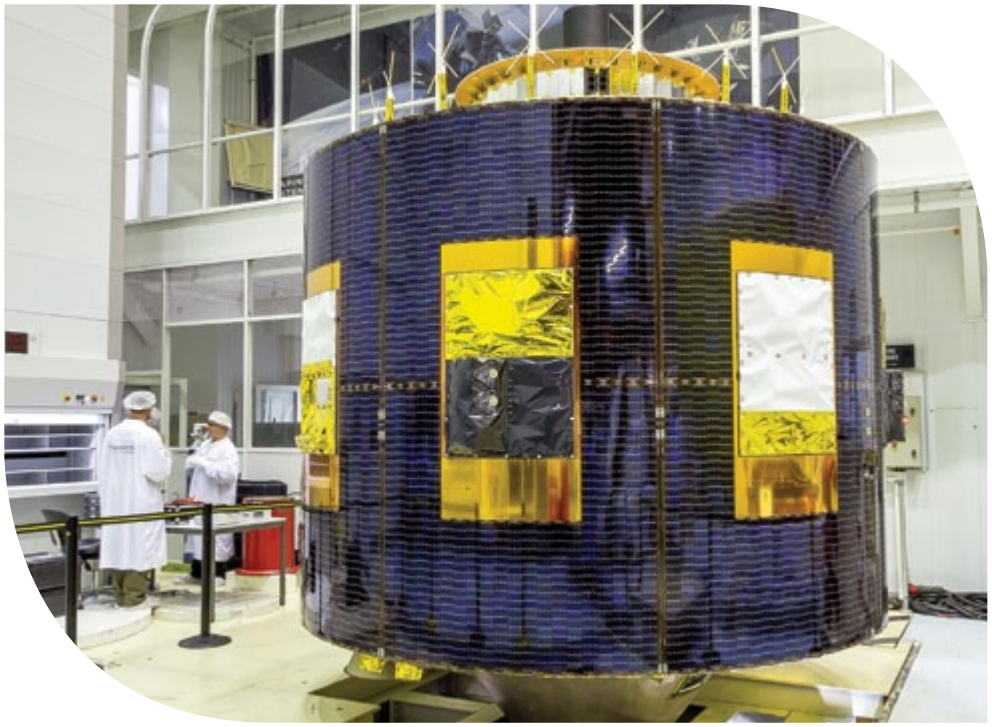
because three satellites dedicated to the climate and the environment, all built by us as prime, will be launched, MSG-4, Jason 3 and Sentinel 3. In addition to these three launches, we are already looking ahead, by working on Meteosat Third Generation stellites and on the SWOT mission.

Leadership

The political choices made at the COP21 conference will impact the future of our children and our grandchildren, who inherit an environment that we are now unable to say if it will still be viable in 100 years.

It's up to our generation to ensure that the darkest scenarios presented by the Intergovernmental Panel on Climate Change do not see the light of day. We are firmly convinced that data from space borne systems will increasingly illuminate our climate and its long-term impact. This data will also help ensure that we can leave coming generations a world in which we can all take pride.

www.thalesaleniaspace.com



MSG-4. Photo: © Thales.

Jason 3

© CNES, 2013 - illustration David DUCROS

ESA: OBSERVING CLIMATE CHANGE FROM SPACE

Satellite observations of Earth provide essential, objective information on the magnitude and rate of climate change worldwide. Over the last 40 years this type of data has enabled crucial advances to be made in understanding the climate system and has been a key component of all five IPCC assessments.

Today Earth-observing satellites are an indispensable means of informing and motivating climate policy decisions. In coming decades they will serve both developing and developed nations as a practical tool for planning and assessing climate change mitigation and adaption actions at local, regional, national and global levels.

Continuous, long-term, global observation is of fundamental importance: Observations of declining arctic sea-ice extent made by space-borne microwave radiometers since the late 1970s have provided definitive evidence of on-going change in one of the most sensitive, but remote parts of the planet.

Global eye

Uninterrupted global measurements of the ocean surface, made by satellite-borne radar altimeters since 1992, have detected global average sea-level rise of some 3mm per year and revealed significant (Fig 1) regional variations in the rate of change.

Exhaustive analysis of satellite imagery of more than 170,000 glaciers worldwide, collected since the 1980s, has delivered the first complete global glacier inventory and documented a pattern of systematic retreat. Policy makers and citizens alike need to be sure that systems delivering such data are sustained as operational monitoring tools into the foreseeable future.

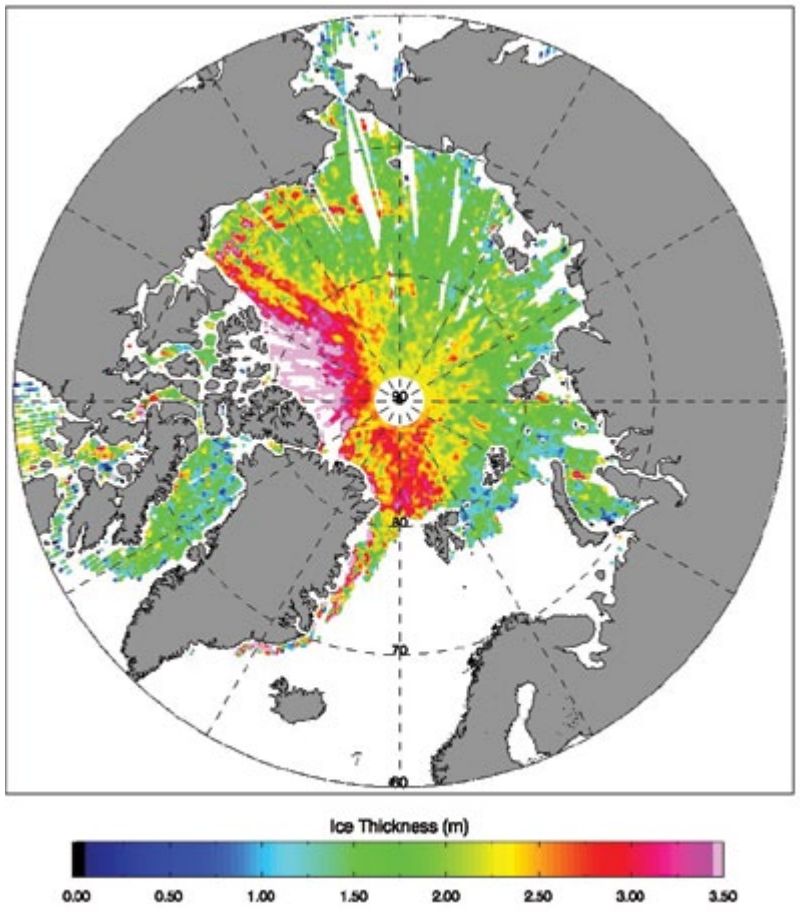
Research satellites introducing powerful new observing technologies are opening a global view of aspects of climate that were inadequately understood to date. New sensors launched during the last five years and measuring, for the first time, “essential climate variables” such as sea-ice thickness (Fig 1), ice sheet elevation changes, global soil moisture and ocean salinity from space, are yielding deep insights into the processes driving climate change.

Strategic investments

In doing so they are laying the basis for the improved climate models and prediction systems that governments and businesses will need to make informed policy, planning and investment decisions in the future.

Space Agencies worldwide are working together towards the delivery of a global

Figure 1.



observation system for climate. European countries are investing massively in a new generation of operational satellites to support climate action and ensure improved weather forecasting for the coming thirty years.

The European Space Agency (ESA) is now building the third generation Meteosat geostationary observing system and the second generation Metop polar-orbiting series, both to be operated by Eumetsat.

ESA and the European Union are together implementing "Copernicus", a major new global monitoring system, which over the next five years will deploy six constellations of "Sentinel" satellites and deliver continuous, long-term, high-quality observations of land, ocean, atmosphere, biosphere and cryosphere from a powerful suite of optical, microwave and infrared sensors.

Analysing variables

The first of these, Sentinel-1, was successfully launched in April 2014. Sentinel 2 A was successfully launched in June 2015 and Sentinel 3 A is planned to be launched at the end of the year.

ESA is also developing the Earth Explorer research missions, which will continue to introduce innovative space-borne capabilities to measure less well understood climate variables such as cloud and aerosol optical properties, atmospheric wind profiles, above-ground biomass and vegetation characteristics and global distributions of greenhouse gases.

Many of these experimental capabilities, when proven and perfected, will be integrated into next generation operational monitoring systems.

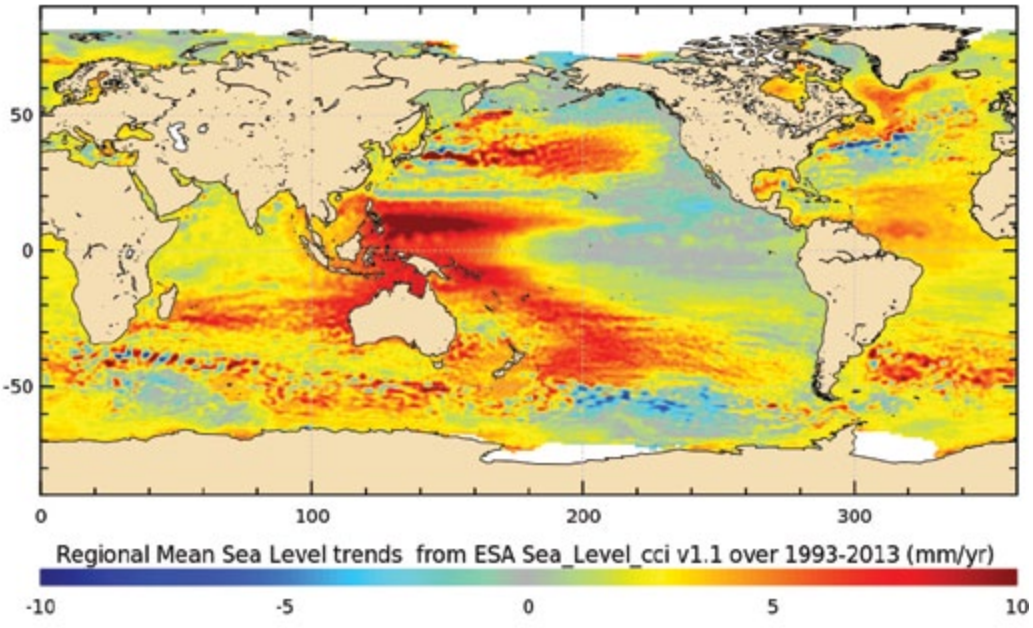
The Copernicus and Earth Explorer systems all operate under a free and open data policy. This signals the strong commitment of European countries to back up their climate and environment policies, by sharing access to this vital data with scientists, public and private sector organizations all over the world, thus ensuring the scientific integrity, transparency and traceability of information used in global decision-making.

Strengthened international cooperation, to establish, calibrate, validate, maintain and share access, to satellite and in-situ observations, for a global climate observing system, will be a key factor in the effectiveness of any concerted global action finally taken on climate change.

www.esa.int

esa
European Space Agency

Figure 2.



REC: A CALL FOR A SUNNY COMMITMENT

REC, the largest European brand of solar panels, outlines how clean, viable and cost competitive solar energy is today, and what policy action is needed from governments to maintain the momentum of solar for a safe climate.

The power sector is the biggest single contributor to global energy-related CO_2 emissions, accounting for a massive 40% worldwide.[1] It makes sense to focus on clean energy if we hope to drive down CO_2 emissions to keep the already-present climate change at an acceptable level. Yet with global energy appetites rising unabated, sources have to be affordable and efficient, as well as vast yet clean, in order to be compatible with economic growth.

Solar energy fits the bill. It's the cleanest energy around, with the lowest impact on the environment. Solar installations are also quicker to set up than any other renewable energy source – a vital consideration in regions such as Africa, where there are still more than 600 million people without grid access.

Grid parity

Cost is also decreasing. Of all the renewable energies, solar is getting cheaper the fastest. With photovoltaic systems now costing half what they did just six years ago, solar energy is achieving grid parity – the cost level at which solar is competitive with conventional sources of electricity – in more and more regions.

A recent Deutsche Bank report [2] found that solar has reached grid parity in roughly half of 60 countries studied, including large markets such as the USA, Japan and Germany, with China and India close behind. Deutsche Bank also noted that prices could fall up to 40% by 2020, giving solar even greater appeal. According to an analysis by IRENA, the generation costs (LCOE) of the most competitive solar utility are already at USD 0.08 per kWh. Germany's Fraunhofer Institute predicts solar will be the world's most common energy source by 2050, powering 40% of global electricity needs, at generation costs as low as 2-4 eurocents per kWh.

Policy stability

These numbers show there is a transition in progress from policy-driven to economics-driven decisions. Yet solar still needs stable and reliable targets, mechanisms and commitments by governments. Policy changes and reversals create uncertainty and slow investment.

Germany, formerly the undisputed leader in solar energy adoption, shows how grim the impact can be: owing to policy changes, new solar capacity in 2015 is predicted to be 35% lower than that of 2014. Germany will fall short of its climate targets and is losing its leadership role in the groundbreaking field of energy transition.

REC is the largest European brand of solar panels, with more than 15 million high-quality panels produced at the end of 2014. With integrated manufacturing from polysilicon to wafers, cells, panels and turnkey solar solutions, REC strives to help meet the world's growing energy needs. Founded in 1996, REC has headquarters in Norway, operational headquarters in Singapore and offices in USA, Europe, MEA, Japan, India and Thailand.

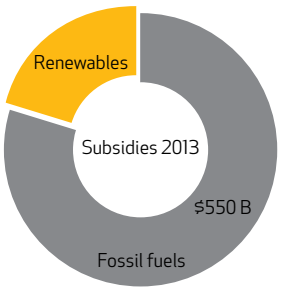
REC calls for the following policy actions:

- Reduce hidden subsidies for nuclear and fossil fuels. Fossil fuel industries received USD 550 billion in subsidies in 2013, four times more than renewables.[3]
- Establish a structural reform of the carbon market to ensure a real price for CO_2 emissions and consider climate costs of fossil fuel energy of up to USD 0.13 per kWh.[4]
- Commit to more ambitious targets for significantly increasing solar's share in the electricity mix. Otherwise we will fail on commitments to keep the global temperature rise below 2°C.
- Promote residential and commercial solar self-consumption more strongly. These green investments should be honored.

www.recgroup.com

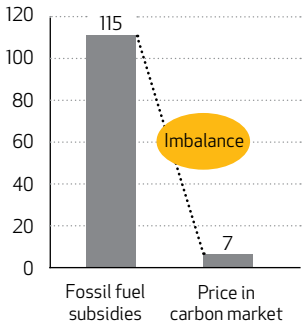
REC

Subsidies



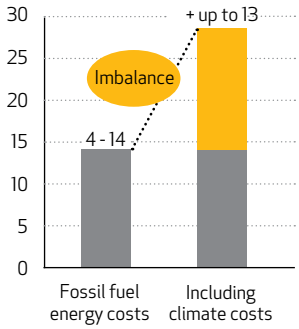
Carbon market

($/t CO_2)



Real climate costs

($ct/kWh)



1 International Energy Agency, Energy and Climate Change, 2015 www.iea.org/publications
2 Deutsche Bank Markets Research: Report on the solar industry, 27 February 2015 www.db.com/cr/en/docs/solar_report_full_length.pdf
3 International Energy Agency, 2015 World Energy Outlook www.worldenergyoutlook.org/resources/energysubsidies
4 IRENA, Renewable Power Generation Costs in 2014 www.irena.org/Publications

POSITIVE FOOTPRINTS: THE YVES ROCHER FOUNDATION

The Yves Rocher Foundation firmly believes that individuals can change the world. Its role is to support biodiversity by assisting women who have created active communities and who are dedicated to this cause; by planting trees – which are symbolic of setting down roots – around the world; by preserving plant species, which are unique and important for everyone; and by capturing moments in time through the enlightening vision of photographers.

The Yves Rocher Foundation – Institut de France was born more than 20 years ago from a family's desire to give back to the plant world part of what we owe it. Since the beginning in the contemporary village of La Gacilly in France, to now throughout the world, its vocation is to take action to leave a positive footprint on the planet. The Yves Rocher Foundation firmly believes that individuals can change the world and take care of environmental and biodiversity issues, which are essential for our future, and often ignored or neglected.

The role of the Yves Rocher Foundation is precisely to focus and take actions for biodiversity. It chose to do so through four sustainable programmes: by supporting committed women who create active communities; by planting trees, symbolic of deep roots, here and elsewhere; by preserving unique plant species that are vital to all of us; by suspending time, thanks to the keen eye of photographers. The 325 winners of the Women of the Earth Awards, the commitment of 100 million trees to be planted by 2020,

Photo: © Pierre de Vallombreuse

THE YVES ROCHER FOUNDATION

4 sustainable programmes since 1991

325 women rewarded in the past 14 years with a total sum of 1.6 million euros

50 million trees planted in 27 countries by 2015 and a target of 100 million trees by 2020

22 years of support for botanical expertise

11 years of support for the biggest open-air photography festival in Europe

Photo: © Pierre de Vallombreuse

the 50 countries in which these actions are implemented and the hundreds of thousands of supporters are more than results; they are calls to continue, to dream and to share.

15 Million trees planted in Ethiopia changed the ecosystems enabling the return of water sources
In Ethiopia, the Yves Rocher Foundation supports Green Ethiopia in protecting water resources. In the absence of any forest cover, Ethiopian soils swept along by rare but violent rains are incapable of retaining water. However, water is the only guarantee for food agriculture which currently supports 85% of the Ethiopian population. For this reason, it is essential to replant trees that will allow with their roots to stabilize the soil and to retain water.

Preservation of the Monarch butterfly in Mexico, hand in hand with the WWF Mexico NGO
Since 2009, the Yves Rocher Foundation has committed to planting more than 3 million trees in Mexico via the Plant for the Planet programme. This action is crucial for the billions of monarch butterflies that come to this biosphere reserve, listed by UNESCO, during the winter.

Support of Peggy Pascal's project, who won the Terre de Femmes Award in 2013
Peggy developed the garden in a sack concept in the slums of Nairobi, the capital of Kenya, in 2008 while working for the NGO Solidarités International. To date, the NGO has identified nearly 240,000 bags in the Kenyan capital's five slums.

www.yves-rocher-fondation.org

YVES ROCHER FOUNDATION
SUPPORTED BY THE INSTITUT DE FRANCE

A FOUNDATION COMMITTED TO THE ENVIRONMENT AND SUPPORTED BY THE INSTITUT DE FRANCE

Since 2001, the Institut de France has supported the Yves Rocher Foundation, which carries out nature protection activities and therefore fits in perfectly with its original institution whose vocation is to work for the good of the greater whole.

The Yves Rocher Foundation and the Yves Rocher brand share the same commitment, respect and love for nature.

The Yves Rocher brand has been the leading moral, technical and financial supporter of the Yves Rocher Foundation for 20 years.

Photo: © Eric Sampers

"Together, to leave a positive footprint."

Jacques ROCHER
Tree Planter and Honorary President of the Yves Rocher Foundation - Institut de France

YVES ROCHER FOUNDATION

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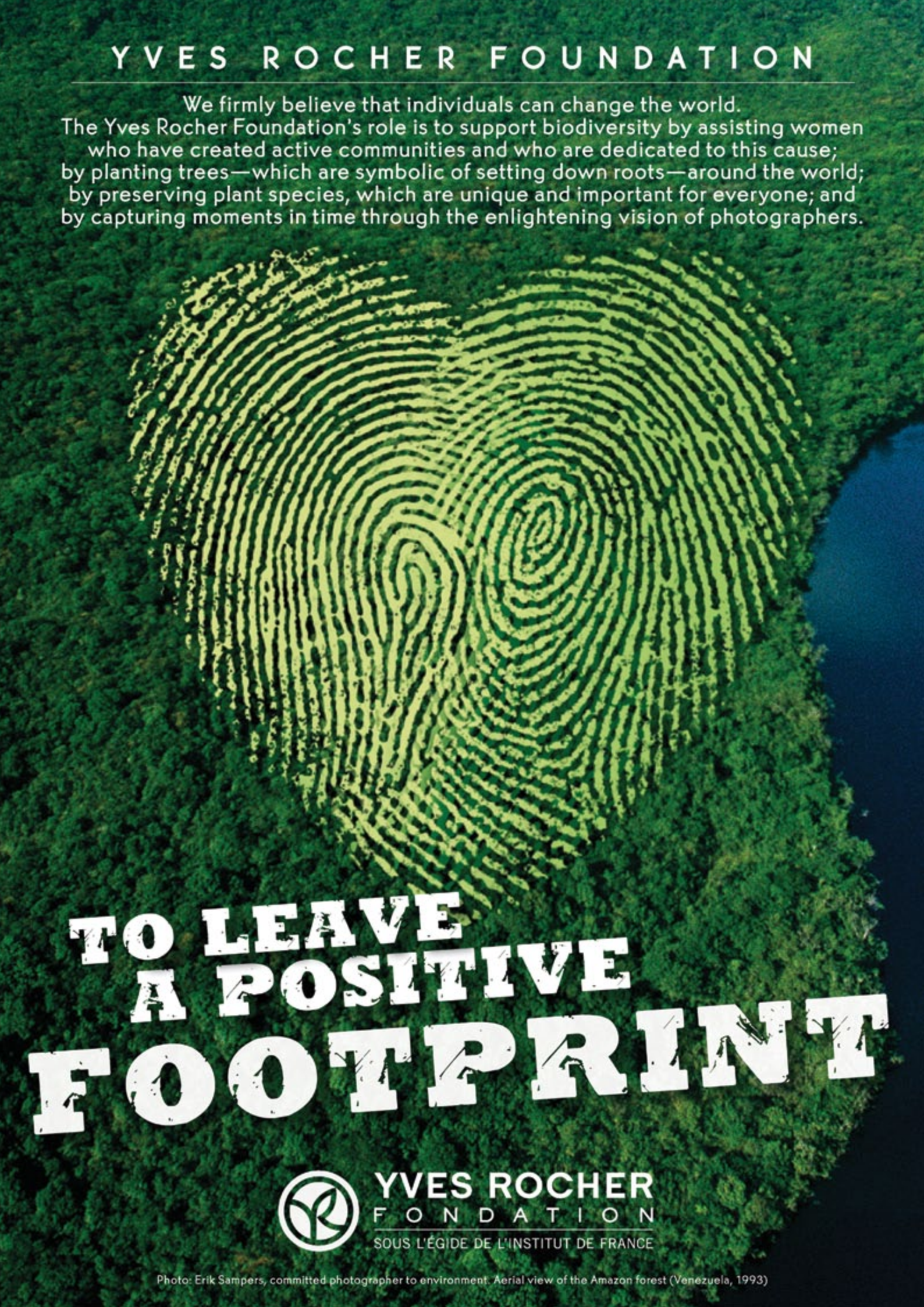


TO LEAVE A POSITIVE FOOTPRINT

YVES ROCHER
FONDATION
SOUS L'ÉGIDE DE L'INSTITUT DE FRANCE

Photo: Erik Sampers, committed photographer to environment. Aerial view of the Amazon forest (Venezuela, 1993)

WHY DON'T MARSHALLESE PEOPLE LEAVE THEIR CLIMATE-THREATENED ISLANDS?

Land is more than a pile of rocks, says Kathy Jetnil-Kijiner; it has eyes to see people's greed and punish them.

By Kathy Jetnil-Kijiner

A few weeks ago I sat down with a CNN reporter who was in the Marshall Islands writing an article on climate refugees. One of the things we discussed was the importance of land to the Marshallese people.

He explained that many Marshallese have told him that the loss of our island to the rising seas from climate change would be devastating. But he wanted to know – why? Why would losing our land be so devastating?

I honestly didn't know how to respond to this. It seemed pretty obvious to me. It's our land – it's our home. But he clarified further that his audience – mainly Americans – might not understand the value of land to our identity and culture. Some might say that we could just pick up and move somewhere else if we lost it. Why would that be so hard? Could I explain it?

I thought about his question. After a while, the story of Liwātuonmour and Lidepdepju came to mind.

I came across this story while doing research for my thesis two summers ago. Liwātuonmour and Lidepdepju were sisters who came to the Marshall Islands from Ep, thousands of years ago. They were pillars of basalt stone who birthed the clans and the Irooj (chiefly) line.

Some say they had the power to bring Irooj back to life. Others say their stone bodies were used to sharpen knives and spears before battles. What can be agreed upon is both of the stone sisters were highly respected, and that one of the stone sisters, Liwātuonmour, went to live on Namo atoll while the other, Lidepdepju, can be found on Aur Atoll.

During the time when missionaries first came to the Marshalls, a Protestant missionary named Dr. Rife threw Liwātuonmour's stone body into the depths of the ocean, in an effort to stamp out "pagan" practices / eliminate the competition. Lidepdepju, however, can still be found on her place in Aur.

Pile of rocks

I met Lidepdepju years ago, when I first moved back to the Marshall Islands after 16 years of living away. While visiting Aur, one of the islands my family comes from, my mother told me to go out and see Lidepdepju. I didn't know much about her except that she was one of the important legends for people from Aur.

Once I got there all I saw was a pile of rocks, maybe up to my knees, out on the reef. Needless to say – I was unimpressed. There was no massive stone alter, no crashing waves, no thunder and lightning, no flowers or spears – nothing to fit into my Disney-addled cartoon imagination. It really was just a pile of rocks. I didn't understand the significance. I left, feeling a bit underwhelmed.

When I returned to the Marshalls to do my research a few summers later, her story came up once again. And then I became obsessed. I wanted to know why this story was so important – why this pile of rocks?

I interviewed four elders during the summer that I was doing research for my Master's thesis. I asked them all about Lidepdepju. Why? Why was she so important to us, to our stories?

Permanence

The response that stayed with me the most was from Alfred Capelle, head commissioner for Customary Language and Law Commission (CLLC), and a noted Marshallese historian, linguist, and cultural expert.

According to Capelle, the value in the story of the stone sisters is one of permanence. Our ancestors saw those same stones, and

their ancestors, and so on. They told the same story, the story of the beginning of our clans. How we came from stone, from earth. And hundreds of years later, our children would see them as well (Unless they wouldn't. Because, you know, climate change).

Either way, these stones are not just imagined spirits – they are tangible. They are real. They live in the waves and our ancestors sharpened their spears on their bodies. I was able to tread slippered feet from the house of my family members, past a grove of bushes and trees, to see her for myself – thousands of years after my ancestors first whispered the story over an open fire.

Our islands are full of stories like these. The infusion of magic and tangible – stories that to the Western imagination might seem fantastical. Stories that explain the spirit of a coral, how a lagoon was shaped, how a grove of pandanus trees was born.

'The land has eyes'

These stories give us insight into the world of our ancestors. They are not unlike the many origin stories from indigenous people all over the world – origin stories that establish a relationship between land and people. A relationship of mutual respect.

There are no stories where the mother, the land, is slaughtered so that the people satisfy their greed – at least not without punishment. Greed is punishable. Greed is remembered. As the Rotuman proverb states – the land has eyes. There is a roro, a Marshallese chant, about Lidedepju that also demonstrates this:

Luerkolik ej ño diun ña durieañ | Lidepdepju erbet inij eo.

Luerkoklik is a reef from Arno atoll. Translated, the chant states, "Luerkoklik is destroying me [in my canoe] because of my sin to Lidepdepju. Is destroying all of us. Lidedepju is destroying the fleet (of canoes.)"

Land has power to destroy us. It has eyes. It remembers.

Climate scientists have been warning that catastrophe will hit if humans do not make radical changes to our lifestyles of consumption and greed. The world will turn on us. Super storms and massive droughts, extinction and rising seas. Mother nature is pissed. Luerkoklik is destroying me… is destroying all of us.

"Indigenous people are trotted forward as mouthpieces, mined for their wisdom, highlighted for their tragedies, and then shoved to the back of the line."

Indigenous people have been saying this for decades, for centuries. And yet only now do we see the same rhetoric being co-opted by green activists in the climate movement. Indigenous people are trotted forward as mouthpieces, mined for their wisdom, highlighted for their tragedies, and then shoved to the back of the line.

And yet we've seen, over and over again, what happens when indigenous people are not included in the conversation (think Greenpeace and Peru). And also what happens when they are.

Mauna Kea is a sacred land for the Hawaiian people. Through the tireless efforts of organizers, and the support of Hawaiian and indigenous people all over the world, the movement has been able to postpone the building of a massive telescope that would desecrate the sacred mountaintop of Mauna Kea.

As I write this, I see photographs on my facebook newsfeed of Hawaiian activists being arrested for obstructing the construction company. Governor Ige has issued a statement that the construction is once again delayed due to the protestors, as well the large boulders, hindering the construction equipment. The earth, and its champions, have spoken.

Pacific Islanders and indigenous peoples play an important role in the climate movement as well. This is even acknowledged in the Pope's encyclical that was released last week. We are here to remind others, industrialized nations, leaders, major industries, that the earth has always been alive – that the land has eyes. It remembers. It will continue to remember. Long after we leave it.

Kathy Jetnil-Kijiner is a poet, journalist and teacher from the Marshall Islands. Follow her on twitter @kathykijiner

Photo: © Christopher Michel | www.flickr.com

THE GLOBAL ENVIRONMENT FACILITY: FUNDING CLIMATE ACTION

The Global Environment Facility (GEF) was established on the eve of the 1992 Rio Earth Summit, to help tackle our planet's most pressing environmental problems. Since then, the GEF has provided over $14 billion in grants and mobilized in excess of $70 billion in additional financing for more than 4,000 projects. The GEF has become an international partnership of 183 countries, international institutions, civil society organizations, and the private sector to address global environmental issues.

By Naoko Ishii, CEO and Chairperson, Global Environment Facility

Is climate change a priority for the GEF?
The GEF commitment to address climate change issues is unequivocal. In 2013-14, we committed a total US$1.4 billion for adaptation and mitigation action. By the end of our current funding cycle in June 2018, we estimate that the GEF will be making about US$3 billion available to developing countries to help address climate change, and expect more than $US25 billion to be leveraged from other sources.

In October, the most recent GEF Council gave the green light to a new work program that puts a strong emphasis on tackling climate change. The meeting approved a work program to provide financing for 17 new projects and 2 programmatic approaches focusing mainly on climate change and sustainable ecosystem management in the Amazon. The work program totals US$233.67 million for new projects and programs from the US$4.43 billion replenishment that began in July 2014, and covers energy efficiency investments, emissions reductions through land management, technology transfer and renewable energy promotion.

What should COP21 in Paris deliver?
To win the fight against climate change and safeguard the global environment we need a large-scale transformation in our economies. This will require actions on multiple fronts and at all levels of society.

Three things will facilitate this. First, the COP21 climate change talks in Paris need to deliver a credible, strong agreement that puts the world on a path to a decarbonized global economy by the second half of the century. Second, we need strong actions on mitigation and adaptation both before and after 2020 by a broad as possible a coalition of stakeholders. And, third, we require the necessary finance to underpin the new agreement and actions on the ground.

How is the GEF contributing to the Paris talks?
As a financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC), the GEF is supporting developing countries' shift towards a low-emission development path. Besides our ongoing support to countries in their UNFCCC obligations (such as national communications and biennial update reports), we have provided financial support to 46 countries as they prepared their Intended Nationally Determined Contributions, and stand ready to help make these "investment plans" operational.

We're also actively supporting the 12 action tracks of the Lima Paris Action Agenda to showcase coalitions, partnerships and integrated approaches for action on the ground in areas such as energy efficiency, land degradation, deforestation, food security, sustainable cities and resilience.

When it comes to climate finance, what role do you see for the private sector?
One of the greatest opportunities for scaled-up climate finance lies in unleashing the most dominant driver of global economic activity: the private sector.

At the GEF, our experience shows that targeted grant finance can be a critical step to enhance private sector engagement in market-based solutions. GEF climate finance in general mobilizes about US$1 from the private sector for each US1$ GEF grant. But, based on a suite of innovative financial instruments—including partial risk guarantees, equity investments, and debt instruments—that we have been piloting recently, we have

been able to mobilize approximately US$7 from the private sector for each US1$ GEF grant.

It is vital we continue innovating on the ground to help developing countries and private sector partners match the right types of financial instruments to specific projects goals and objectives.

Interestingly, we are now seeing demand for such innovative instruments in other climate-relevant areas than the "traditional" energy efficiency and renewable energy fields. For example, at the last GEF Council in October, a new project was approved which will mobilize private financing for land restoration in Latin America through the provision of GEF-funded guarantees or subordinated loans.

How important it is to invest in adaptation?
Given that we're already locked into climate change trajectories for many years to come, adaptation will be at the core of the new climate agreement. And, the international community needs to ensure finance flows to the poorest and most impacted countries.

At the GEF, we have a strong track record to build upon, and a valuable set of experience that can help provide guidance going forward. With nearly US$1.3 billion in funding approvals from our two dedicated adaptation funds--the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF)—in nearly 130 countries, our adaptation program will directly reduce the vulnerability of more than 17 million people, while helping 70 countries integrate climate risks into their policy-making and planning processes. Demand for financing from our two funds remains strong.

How can Paris contribute to recently adopted Sustainable Development Goals?
Paris is a huge opportunity to demonstrate political ambition and action on climate change. The recently adopted Sustainable Development Goals recognize that the health of the global commons — the planet's finite environmental resources, from land and forests to oceans and the atmosphere— is essential for a thriving world, and provide a guide to where we will have to invest in order to transform our economies and prosper within planetary boundaries.

The SDGS hold the promise of a fresh start for our planet, but if we don't tackle climate change, it will be impossible to achieve these goals.

What role can the GEF play in protecting the planet?
Today we all stand at a defining moment for the future of humankind. We have already reached or exceeded the carrying capacity of several of the earth's ecosystems. The next ten years will likely see another 700 million people added to the world population, more than one billion additional middle-class consumers, and 50 percent growth in economic output.

On an increasingly crowded planet, action is urgently needed to curb the drivers of global environmental degradation.

Against the background of unprecedented challenges for the global environment, our governing body, the GEF Council, has adopted the GEF2020 strategy. GEF2020 emphasizes the need to support transformational change and achieve impacts on a broader scale. The strategy calls for the GEF to focus on the drivers of environmental degradation, and it addresses the importance of supporting broad coalitions of committed stakeholders and innovative and scalable activities.

Rooted in our role as a financial mechanism for the Rio Conventions and other multilateral environmental

agreements, the GEF is uniquely placed to help buttress Earth's life support systems that are vital for all. Based on our more than two decades of experience, we increasingly recognize the importance of tackling complex interdependent issues in an integrated manner.

Our financing, holistic approach and wide network of partners help catalyze innovation and transformational change to provide the stable conditions on Earth required for the future we want. We are supporting multi-stakeholder alliances to take action to preserve threatened ecosystems, build greener cities, boost food security, promote clean energy and help lay the foundation of a more prosperous, climate-resilient world.

www.thegef.org

AGROBANCO: THE DEVELOPMENT OF A GREEN BANK

Banco Agropecuario – Agrobanco is a specialized development bank that promotes the association and financial inclusion of small and mid-size producers in Peru, fostering their capitalization through the generation of profitable and sustainable activities.

In order to fight the effects of climate change as a vulnerable country and promote good agricultural practices that lead to an increased efficiency and profitability of producers, Agrobanco has initiated the process to become a green bank by adapting, on a gradual basis, mechanisms aimed at this objective in its commercial and business practices.

Its trade dynamics and social role, as a modern and sustainable development institution, are focused on the highlands and jungle areas where family agriculture and small-scale production units prevail. 85% of its customer portfolio, that is 92,000 customers, are in these regions.

Growing portfolio

Agrobanco has a portfolio of credit products tailored to producers' real needs, for both working capital and investment, and this is the result of its knowledge of the field and of the agricultural market. It manages 461 product sheets that meet producers' requirements in terms of geographical location, production costs, market and prices.

The importance of its presence in the field leads to the diverse composition of its customer portfolio: 48% are exclusive customers who work with Agrobanco only. 20,000 small producers have been integrated into the banking system through Agrobanco's credit. 17% are in border and high Andean areas above 2,500 metres above sea level.

Customers located in areas of poverty and extreme poverty represent 89% of the portfolio. In this segment, the Financial Deepening strategy is disseminated, which has been especially created to serve micro and small producers from remote areas with association promoting credits.

Progress
Agrobanco participated in the World Climate Summit in Lima, COP20, through a series of activities of dissemination, promotion, debate and analysis of the green and ethical bank concepts, which ended with the execution of the "Green Protocol" launching a series of finance and microfinance institutions.

These will be represented by the Peruvian Banks' Association and Association of Peruvian Microfinance Institutions through which financial entities in Peru undertake to implement friendly environmental mechanisms in their banking operations and procedures.

It has signed cooperation agreements with specialized international institutions, such as the French Development Agency for the implementation of an Environmental and Social Risk Analysis System, the Finance Alliance for Sustainable Trade, for determining the social and environmental impact indicators that must be incorporated into Agrobanco's procedures, and the German Agency for International Cooperation, for the technical support from a specialist to design and implement the Forestry-Based Businesses and Agroforestry Department in the Bank.

Sustainable development
This learning and cooperation process will allow Agrobanco to adjust the portfolio of financial products towards the implementation of sustainable production systems, including social and environmental risk management elements in forestry, livestock breeding and agriculture credits (good agricultural practices) and financing for technical irrigation machinery and energy efficient equipment.

Internally, on a path leading to involvement of the Bank's central-level employees in these new concepts and commitments, with the support of a specialized entity, it has measured the carbon footprint and prepared Agrobanco's eco-efficiency environmental plan. A step that, without a doubt, sets out the path towards becoming a green bank.

In this process, Agrobanco's objective is to promote sustainable development through financing for producers who comply with good agricultural and environmental practices, promote the use of clean and renewable

energies through its credits, include 'green' elements in its management policies, integrating social and environmental variables with eco-efficiency and sustainability criteria, and develop an organizational culture that contributes to environmental conservation.

Opportunities
The partnership formed with cooperation agencies and other local specialized institutions will allow Agrobanco to have access to the market of green funds so as to transfer them to the national agricultural sector, thus contributing to the standards of a development bank committed to the environment.

Thus, Agrobanco's path opens in the following aspects:

- Identification of sustainable projects to attract national and international 'green funds', as well as subsidy mechanisms for technical assistance and training;
- Financing of projects for environmental and social risk management (Good agricultural practices, efficiency in energy use, etc.);
- Improved positioning as Sustainable Bank in line with global institutions;
- Public-private partnerships with international sustainable development institutions;
- Actions for internal management of environmental and social risks improve efficiency, reduce risks and costs, and meet our role as Development Bank.

www.agrobanco.com.pe


CLEAN AIR
CLIMATE JUSTICE

MARINGÁ: THE HOME OF ENVIRONMENTAL INNOVATION

Maringá is one of the first Brazilian cities planned with the Europe's garden city concept, with wide natural reserve areas protecting urban riverheads, widely wooded roads and many squares.

Long before global concerns over the environment started to grow, Maringá adopted innovative programs that married urban growth with quality of life provided by the green coverage. The city has seven native forest reserves and ecologic parks, hundreds of squares, more than 100 thousand trees on public roads, about 31.5 thousand linear meters of stream banks in urban areas and more than 25 square meters of green area per inhabitant. This framework requires preservation programs, and thus, Maringá seeks to be always ahead with innovative projects to protect its environmental heritage.

Maringá is a municipality in southern Brazil founded on 10 May 1947 as a planned urban area. It is the third largest city in the state of Paraná with 385,753 inhabitants in the city, and 764,906 in its metropolitan area.

Radical delivery

In recent years we have witnessed much progress. We can start with the Municipal Plan of Mata Atlântica Protection and Recovery, the first in a countryside municipality and the second in Brazil, which is now used as the basis to developing plans all over the country. More than three thousand Brazilian cities have taken concepts from Mata Atlântica, and will develop their own

municipal plans. Maringá's plan was developed in association with the SOS Mata Atlântica Foundation and in collaboration with the Local Environment Municipal Council, establishing guidelines to the diagnose, classifiy and map the city's green areas, indicating the priority sections for protection, environmental recovery and those designed for sustainable urbanisation. The study also defined the protection and recovery of the municipality's water bodies, prioritising the areas of public supply water sources. In urban areas, the Plan includes the review of the Forestation Project, ensuring the protection of the existing trees and the regeneration of the public area's woods. In addition there are Biodiversity Hallways, structures linking sections of creeks to the movement of the animals in parks, native forest reserves and valley floors. The plan also ensured watercourse protection in urban areas, increasing from 30 to 60 meters from the margins, double that required by the Forestry Code. The valley floors also receive protection with fences and the establishment of ecologic sidewalks for residents' leisure, whom, with such benefit, are stimulated to help with the maintenance of green areas. The administration already fenced more than 8 thousand meters and set up 20 thousand square meters of sidewalks on valley floors.

Water innovators

The city hall also invested to eliminate an old problem on two of the main native forest reserves of the municipality: the gullies, caused by the rainwater in the Parque do Ingá and the Horto Florestall, the latter being a private area of environmental interest. In these two reserves, drainage channels were implanted by the protection system with rocks and steel screens. The technology allows the establishment of capture channels and dissipation of rainwater with less impact on the flora's removal and greater rainwater absorption. In Parque do Ingá we also deployed an identification and riverheads recovery program, called Recovering Watersources, which cleared buried riverheads inside the reserve. As part of its water usage policy, since 2007, new schools and daycare centres are built with capture systems and are re-using rainwater. Maringá also stands out as a pioneer in developing environmental permits in Brazil. It is the first municipality in Paraná and one of the first in Brazil to offer this service, which was exclusively held by the State. The city hall structured itself to install the licensing, has sped up the process to establish new ventures and further encourages the economic development of the city.

www.maringa.com

MARINGÁ CITY

HOW IS GLOBAL WARMING CHANGING THE ALPS?

The average temperature increase in the region seems higher than the global average: nearly +2°C from 1880 in Austria, compared to +0.85°C at global level (2014 Austrian Assessment Report).

Since 1901, the increase in temperature in the Alpine areas of Germany was 1.5°C, compared to a 0.9°C average for Germany (BMU, 2007). This suggests Europe's soaring mountains belong to the areas deemed most vulnerable to climate change.

Climate change in the Alps has many faces. Take, e.g., the changes in precipitation: an increase in winter and a decrease in summer is expected (BMU, 2007). The association with the increase of temperature will likely lead to more rain (rather than snow) in winter. The snow cover line is estimated to rise according to the OECD 2007 by 150 m for each 1°.

Facing the challenges

The changes in precipitation will increase the frequency of natural risks; like floods and melting of glaciers, but also droughts and forest fires. This will likely lead to changes in the landscape and the ecosystems, especially a shift of the tree line and species moving upwards to cooler areas.

Some plant species may find new opportunities in areas to which they have not been adapted before, for example wine culture in some northern valleys of the Alps.

We have to expect that these changes will have significant impacts on the economy in the Alps from tourism and agriculture to energy and transport. Many sectors will have to adapt. Winter tourism which currently is a major income generator in the Alpine region is likely to come under increasing pressure.

This highlights the need to diversify the touristic offer also through enhanced entrepreneurial responsibility. Many sectors will have special significance in mitigation with measures like shifting traffic towards more climate-friendly means of transportation, developing renewable energy sources and improving energy efficiency, especially in building (see e.g. the Constructive Alps Award for sustainable housing), as well as more sustainable spatial planning.

Standing ready

New approaches are being, and will have to be, developed taking into account the changes in the environment when elaborating new plans. Since climate change in the Alps is a common issue for all the Alpine countries joint efforts are needed and the Alpine Convention provides a viable platform to do so. In the scope of this international cooperation, the Alpine Convention addresses climate change in two main domains.

Policy development, implementation and awareness raising

This includes the Declaration on climate change and the Action Plan on climate change in the Alps, focusing on implementation and awareness raising including guidelines and adaptation strategies on particular fields such as water management and natural hazards.

These strategies, in particular aim at minimising the risks connected to climate change, protecting public health, quality of life, properties and preserving nature by taking advantages of new opportunities.

We have high expectations as to the outcomes of COP 21 in Paris. But we also aim at doing our homework. In many respects the Alps have become a laboratory for good practices for key issues in respect of both adaptation and mitigation, such as renewables, sustainable mobility, energy efficiency and saving, nature protection and sustainable forest management.

We all need to reinforce our efforts to ensure a safe, prosperous and productive life not only in the Alps, but also the other mountain ranges of the world and our planet as a whole.

www.alpconv.org

alpenkonvention · convention alpine
convenzione delle alpi · alpska konvencija
www.alpconv.org

The Alps, the highest and most extensive mountain range in Europe, cover a territory of 190.688 km² and belong to the most densely populated mountain ranges in the world with more than 80 inhabitants/km². They are also home for numerous animal and plant species.

The territory of the Alps encompasses eight countries: Austria, France, Germany, Italy, Liechtenstein, Monaco, Slovenia and Switzerland. These eight countries, and the European Union, signed an international treaty for the joint sustainable development and protection of the Alps, called the Alpine Convention.

Its bodies represent the political and expert level basis for the management of the alpine territory and joint coping with its challenges – like climate change. Find out more about the Alpine Convention on our webpage: www.alpconv.org

Photo ©: Jerome Bon

FROM GAS TO GREEN: TRINIDAD AND TOBAGO OUTLINES CLIMATE GOALS

Fossil fuels have historically underpinned the Caribbean nation's economy, but in the face of a warming climate and the threat of rising seas the government is exploring ways to diversify growth.

"Your country has been a champion in addressing Climate Change and we need more strong leadership like yours in this regard," UN secretary general Ban Ki Moon told Trinidad and Tobago prime minister Kamla Persad-Bissessar SC in June this year.

Ban was referring to Trinidad and Tobago's hosting of the Council for Trade and Economic Development (COTED) back in 2013 in which the Caricom Energy Policy was born, paving the way for ambitious targets for carbon dioxide emission reduction, and thus for renewable energy technologies to be deployed throughout the Caribbean.

In her address at the United Nations General Assembly on Climate Change in September 2014, the prime minister focused on ongoing and future activities in energy for the mitigation of climate change. She touched on current efforts in the industrial sector in terms of energy efficiency.

The Honourable Kamla Persad-Bissessar, Prime Minister of the Republic of Trinidad & Tobago, speaks with Ban Ki Moon, Secretary General of the United Nations.

The reduction of carbon dioxide emissions in the industrial sector is Trinidad and Tobago's first major priority she said, as the sector continues to commission higher efficiency combined cycle natural gas-powered power plants.

Green investment

Emphasis is being placed on low carbon transport including the approval of a compressed natural gas master plan worth USD$300 million which is being actioned via a special purpose company to implement various incentives including for the purchase of hybrid and electric vehicles. These incentives are targeted for the rapid uptake of these low carbon vehicles.

This deployment is well on its way as the cabinet of Trinidad & Tobago has approved a feed-in tariff policy for implementation when the relevant Acts are amended to allow it. This clears the way for rapid development of solar PV, wind and biomass generated electricity into the national grid. Keeping in line with these developments, fast-tracking of a Wind Resource Assessment Programme promises the delivery of up to 100MW of electricity from wind power. It is envisaged that the wind farm will be sited on the East Coast of Trinidad.

These efforts are being recognized the world over and has been cited by the United Nations Environmental Programme (UNEP) as "demonstrating vision and political ambition through decisions and projects on clean energy".

UNEP has recognized the work of the Government of the Republic of Trinidad and

Tobago by providing technical support for a "feed-in tariff tool kit" as well as selecting Trinidad and Tobago as the only island for their video essay 'FIT for Change' on display during this Assembly. This is a significant achievement by one of the world's largest LNG exporters.

Efficient lighting

Prime minister Persad-Bissessar SC also made mention of the Lightbulb Exchange Initiative.

The "Cleaner Energy Initiative of the Year, International" Petroleum Economist Award-winning Pilot Lightbulb Exchange Initiative is an ongoing activity at the energy ministry and is evidence that small changes to energy usage can have a big difference for the environment. The programme is focused on low-income rural areas and is continuing with preliminary results showing that consumers are reducing energy consumption and reducing electricity bills by simple yet effective changes to daily routines.

Education and awareness campaigns continue to be a national priority particularly focused on energy efficiency and renewable energy to empower citizens via a highly stylized and extremely successful national energy communication campaign (www.myenergytt.com) to maintain good energy-efficient choices as part of their daily lives.

Low emission homes

In July 2015, Trinidad & Tobago launched the country's very first fully solar-powered, 100% energy efficient home for viewing. This house uses no energy from the Trinidad and Tobago Electricity Commission's (TTEC) grid and is 100% powered by solar power.

An employee of the Trinidad and Tobago Electricity Commission demonstrates their grid-tied Solar PV system.

It is the second of its kind in the entire Caribbean region, with the first built in Barbados. The home is an initiative pioneered by the energy ministry with the aim to bring greater awareness to renewable energy and the benefits of using various energy conservation technologies for enhanced energy efficiency.

Visitors to the house can see how renewable energy can be used to fuel their everyday lives and also what a fully energy efficient house looks like in terms of the way it is built, the appliances used, the materials used in its construction and the practices employed on a day to day basis to save energy.

"In Trinidad and Tobago we have the human capacity for innovation, tolerance for newer ideas and a vision to achieve excellence in all spheres of human endeavours," said the prime minister recently. The mentioned measures undertaken to mitigate climate change and implement renewable technologies show that we indeed have just that.

Ministry of Energy and Energy Affairs, Trinidad and Tobago

www.myenergytt.com

A view of the first 100% Solar-Powered home in Trinidad & Tobago.

ITALIAN LEADERSHIP: ABRUZZO STYLE

Regione Abruzzo has been working hard over recent years to develop a multi-level governance model to boost growth and environmental protection.

This aims to achieve the 2030 EU climate and energy package objectives of 40% greenhouse gas cuts on 1990 levels by 2030, through the involvement of local and regional authorities. Using its experience implementing low carbon policies the government has extended this model to a wider area: the Adriatic and Ionian Macro-Region.

Regione Abruzzo is convinced that local governments can play a decisive role in the mitigation of the effects of climate change, especially if we consider that 80% of energy consumption and CO2 emissions is associated with urban activities.

Grassroots emphasis

For this reason there is a need for a "bottom up" strategy, with leadership from individuals and communities to achieve a strong, practical impact in the fight against climate change.

Regional governments play a vital role as bodies aware of the different needs and approaches at local levels. This multi-level governance requires investment from regions, provinces and municipalites.

The Covenant of Mayors is an outstanding model of multi-level governance and a tool of great potential. In order to translate their political commitment into concrete measures and projects, all 305 Municipalities and the 4 Provinces of Abruzzo have joined the Covenant.

They have provided a Baseline Emission Inventory (BEI) of their territories and have committed to submit, implement and monitor a "Plan of Action for the Sustainable Energy" (SEAP) in which the actions that they intend to take to achieve the general objectives laid down in the Covenant of Mayors are outlined.

Abruzzo 's 4 provinces.

Torre del Cerrano.

Costa dei Trabocchi.

The implementation of the initiative has been really successful in the Abruzzo territory as the following results have been obtained: 60% of the electricity consumed in 2013 was produced from renewable sources and 71% of electricity produced comes from renewable sources.

Regional communication

The need to share the local achievements and the linear energy and electrical networks with other countries, as well as the need to organize joint infrastructure networks which take into account the needs of different territories through a multi-level governance, are reflected in the Adriatic and Ionian Macro-Region.

This strategy is the extension of the local multi-level governance to several territories through the connection of all infrastructures and energy networks which are necessary not only for each single territory, but for the whole system.

The Adriatic and Ionian Region, home to more than 70 million people, is a territory that stretches along the Adriatic and Ionian basin covering eight countries: four EU Member States (Croatia, Greece, Italy, Slovenia) and four non-EU countries (Albania, Bosnia and Herzegovina, Montenegro, Serbia).

The Macro-regional approach is an innovative mode of territorial cooperation among regions and nations, with balanced and sustainable development as a shared goal. The base of its philosophy is that common challenges and opportunities can better be faced through multilevel and more focused cooperation.

Regione Abruzzo, Dipartimento Opere Pubbliche, Governo del Territorio e Politiche Ambientali - Servizio Politica Energetica, qualità dell'aria, SINA www.regione.abruzzo.it

Regione Abruzzo is a public authority with administrative and legislative competence, settled by the Italian Constitution, in all fields. The Region is particularly committed to the environment and sustainable development, renewable energy, climate change, management of natural resources and waste.

Adriatic and Ionian Macro-Region
© EuroGeorgraphics Association for the administrative boundaries.

Climate innovation
As such, the Adriatic and Ionian Marco-region represents a new governance level located between the nation state and the supranational community.

It involves local, regional, national and community levels in a transnational and interlinked geographic scale in which diverse visions and interests interact with effects inside the European Union, between member states, regions and cities belonging to the same spatial scale, and also outside the EU, with accession and neighboring countries.

For all these reasons, by exporting its successful multilevel governance model to the Adriatic and Ionian region Regione Abruzzo has extended the benefits that were obtained on its own territory to a much wider area also creating a best practice example that is replicable across Europe.

www.regione.abruzzo.it

REGIONE ABRUZZO

Eremo di S. Onofrio.

Lago di Barrea.

MÉXICO: A FRAMEWORK FOR SUSTAINABLE AND RESILIENT DEVELOPMENT

In 2013 México's President Enrique Peña Nieto announced the creation of the Ministry of Agrarian Territorial and Urban Development (Secretaría de Desarrollo Agrario, Territorial y Urbano, SEDATU).

This new federal institution was established as the head of the sector and the lead of the National Urban and Housing Policy. This structural reform is a key measure to counteract the effects of the scattered and low density development in México, as well as inadequate territorial policies from previous decades.

The institutional purpose of SEDATU aims for optimal use of the national territory, in order to enhance productivity, allowing social inclusion and a holistic approach to sustainable development in human settlements.

In order to fulfil these goals SEDATU, as the head of urban and housing, stretches coordination with the three levels of government as well as across public institutions. It also works alongside with the National Housing Commission (Comisión Nacional de Vivienda, CONAVI) which is a decentralized institution and technical arm of SEDATU in charge of the housing agenda.

CONAVI is also responsible for two key strategies that the Mexican Government is promoting towards sustainable development: NAMA for New Sustainable Housing and NAMA for Sustainable Housing Retrofitting. Both initiatives add to the national contributions towards mitigation and adaptation of climate change from the built environment field.

Green mortgage
The success of such programmes relies on the collaboration of other important institutions which are part of the sector. INFONAVIT (Instituto del Fondo Nacional de la Vivienda para los Trabajadores) is the National Mortgage Institution for Workers and the implementer of the ¨Green Mortgage¨.

This scheme allows the beneficiaries of INFONAVIT mortgage to include energy efficient and water saving technologies in their homes under a cost-effective solution. Costs are absorbed throughout the duration of the credit, and generate significant savings for the household in terms of water, electricity, gas and hence lower costs and expenses.

SHF (Sociedad Hipótecaria Federal), known as the Federal Mortgage Society, is also a crucial institution for the design and implementation of green housing schemes through the ECOCASA program.

It consists on granting concessional credits for the construction of energy efficient housing as well as transforming the housing market in México by integrating technologies that reduce at least 20 percent of greenhouse gas emissions from the conventional housing setup.

The program seeks to transform the social housing sector of México, aligned with the national objectives regarding Climate Change, to provide financial incentives and technical assistance to housing developers.

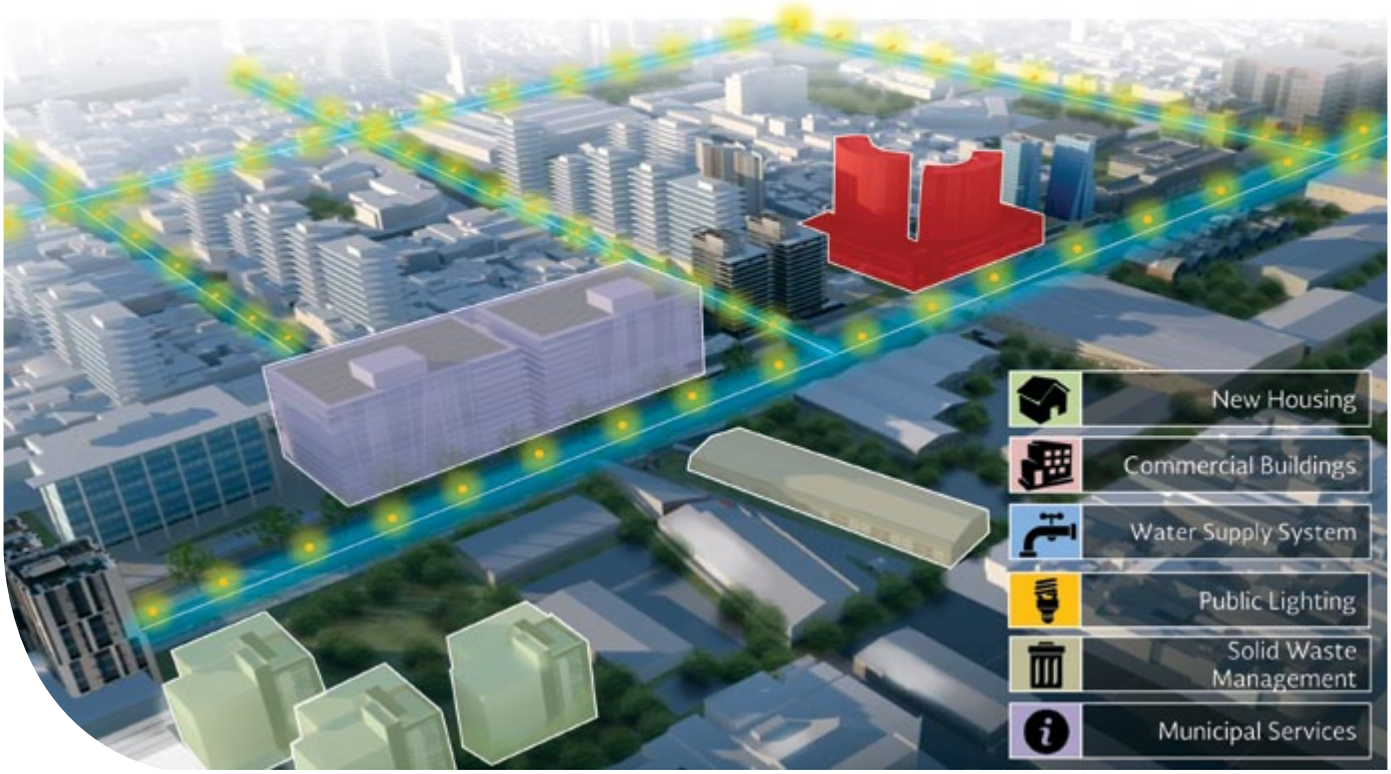
New strategy
At present, México is also pursuing aggressive action to prevent greenhouse gas (GHG) emissions growth through sustainable economic development.

The increasing trends in population growth and urbanization, combined with financial incentives that result in urban sprawl are increasing the pressure on municipal governments to deliver effective and efficient public services.

Without additional action, as many as 5-10 million new homes will be constructed in México over the coming decade, resulting in more than 70 million tons of GHG emissions by 2020.

For this reason, SEDATU is working towards the creation of the Urban Nationally

Instruments for Climate Action:
Key Components of the Urban NAMA



Appropriate Mitigation Action (Urban NAMA). The strategy seeks to directly address growing GHG emissions by expanding the operational and financial scope of both housing NAMAs to cover the full range of community development including building envelope, water delivery, sewage, public lighting and municipal solid waste.

Technical guidance

The Urban NAMA achieves these objectives by attracting carbon finance through a supporting Monitoring, Reporting, and Verification (MRV) framework that enables performance based payments and the potential creation of carbon credits.

The Urban NAMA leverages revenue streams to access additional commercial and development finance to deploy nation-wide sustainable investments. Furthermore, the NAMA creates and provides technical guidance and training to ensure that sustainable technologies achieve their full potential.

These are some of the actions promoted by the Mexican Government which aim to change the paradigms of the existing urban and housing policies, and lead the way towards sustainable development as well as an environmentally responsible approach of the built environment. México is a predominantly urbanized country.

It is crucial to strengthen and increase the current measures to take on the challenges of the urban context as an opportunity for transformation of human settlements into places of welfare and prosperity but also able to grow and coexist with the natural environment.

www.sedatu.gob.mx

SEDATU
SECRETARÍA DE DESARROLLO AGRARIO, TERRITORIAL Y URBANO

The Ministry of Agrarian, Territorial and Urban Development (SEDATU) is an institution of the Federal Public Administration which purpose is planning, coordinating, managing, creating and executing public policies of territorial management. It also aims to ensure dignified housing, promoting adequate urban and rural development and providing legal certainty to the agrarian centres, improving the quality of life for the Mexican population, preventing settlements in high risk areas and providing immediate attention to natural disaster situations.

BENIN: OPEN FOR CLEAN ENERGY INVESTMENT

African country ready for big infrastructure investments to strengthen electricity grid and cut emissions in second compact with Millennium Challenge Corporation.

Benin was selected in December 2011 as an eligible country by the Millennium Challenge Corporation's (MCC) board of directors to develop a second compact after successful completion of the first one.

An analysis of obstacles to economic growth and private investment identified electricity provision and energy infrastructure as some of the major constraints to development in Benin. The second Benin Compact is focused on the energy sector with $US 375 million representing MCC funding and $US 28,125 million in national contributions. It is a first in MCC funding for renewable energy.

The programme's objective is to "increase businesses productivity, and to create great economic opportunities for households, as well as to increase the Benin government's ability to provide public and social services through quantity and quality improvement of electricity."

Venture's aims

The programme includes four projects: policy reform and institutional strengthening; electricity generation; electricity distribution; off-grid electricity access.

The reform project aims, first, to improve the overall governance of the electricity sector through operational support to an independent, strong and professional regulatory institution, as well as tariff reforms and the establishment of an institutional and regulatory framework favourable to independent electricity producers.

Second, it looks to improve governance of the electricity distribution company, operation and maintenance of infrastructure.

Third, it aims to inform and educate people on tariffs, energy efficiency and other key issues of the electricity sector.

Boosted capacity

The energy generation project will help increase the country's domestic generation capacity by up to 80 MW while decreasing its dependence on external energy sources. As part of this project, four photovoltaic solar power plants of an overall capacity of 50 MW will be installed in Natitingou, Djougou, Parakou and Bohicon.

That is together with the rehabilitation of three existing thermal generation plants of an overall estimated capacity of 32 MW in Natitingou, Parakou and Porto-Novo, as well as the rehabilitation and installation of an additional turbine at the Yeripao micro hydroelectric plant for a total generation capacity of 1 MW.

The implementation of renewable resource projects for generating electricity in Benin (Millennium Challenge Account Benin II) would help to reduce the use of fossil fuels and hence greenhouse gas emissions.

Lesser reliance on fossils

Thus, the long-term impacts of establishing photovoltaic power plants (PVPP) at various locations in the country would be beneficial, allowing not only for increased availability of electricity, but also producing electricity in a way that does not directly consume fossil fuels.

To calculate greenhouse gas reductions, it is assumed that a litre of diesel would generate three kilowatt hours of electricity and that a total of 121.2 gigawatt hours per year would be generated by the PVPP. Since the combustion of a litre of oil releases 0.003 tonnes of CO_2, according to the World Resources Institute, the implementation of all proposed PVPPs would result in savings of about 119,240 tonnes of CO_2 per year based on reducing the use of diesel fuel by 250,000 barrels. Over the 25 year lifespan of the PVPPs, a cumulative reduction of 2.5 million tonnes of CO_2 would be achieved.

Grid bolstered

The electricity distribution project aims at modernizing and strengthening Benin's electricity distribution infrastructure to expand grid capacity to accommodate future growth, improve grid reliability, and reduce losses and untimely outages. The project will help improve the grid serving Cotonou and also regional networks as a complement to photovoltaic solar generation plants investments, as well as the building of a modern distribution dispatch and control center to more effectively manage the network.

Finally, the off grid electricity access project will help improve and strengthen Benin's off-grid electrical policy and institutional environment together with providing a grant facility to fund off grid electrification.

The second Benin Compact is the greatest MCC funded energy generation project to date. It will help cover about one third of the 250 MW electricity demand peak. This Compact includes the largest solar photovoltaic investments for about 50 MW, the largest off grid electricity project amounting to $US 45 million, and an important reform project of $US 41 million.

The second Compact will serve as a lever to mobilise private sector resources to effectively promote renewable energies in Benin.

www.ucf.bj

UCF MCA-Benin

Unité de Coordination de la Formulation du 2ème Programme et du Suivi des Réformes de MCA-Bénin

AFTER THE POPE'S PLEA, WHAT DO OTHER FAITHS THINK ON CLIMATE?

Scholars from Hinduism, Islam, Judaism and leading evangelicals explain why the environment matters to them.

By Megan Darby

For Christianity, Islam and Judaism, it is care for divine creation. In Hinduism, there is Rta – the principle of natural order.

Every religion has its traditions of protecting the environment. The degree to which they are observed varies, as faith rubs up against economic and political realities.

June's encyclical, or letter from Pope Francis to his flock, has been widely hailed for its urgent call to action on climate change.

Coming months before countries aim to strike a deal in Paris, it was an undeniably powerful intervention.

Yet for the thoughtful religious practitioner, the lengthy chapter on the gospel of creation is at least as important as the policy recommendations.

It is these ruminations on God's love that could strike a chord with believers not previously attuned to environmental concerns.

And it is not exclusive to Catholics but addressed to "all people living on this planet". So how is it going down with Muslims, Jews, Hindus and other segments of Christianity?

Photo: © MM, www.flickr.com

Halo effect

"He [Pope Francis} has got an incredibly friendly and warm personality and does very well in creating a sense of a big tent," says Fletcher Harper, Episcopal priest and director of GreenFaith.

"I have seen lots of groups, Christian and otherwise, wanting to add to the chorus… There is a real halo effect."

Even among the ranks of US evangelicals, better known for hostility to climate science, there may be some receptiveness to the Pope's bible lesson.

Reverend Richard Cizik certainly hopes so. A lobbyist for the National Association of Evangelicals for ten years, he was forced to resign in 2008 after airing views on climate change and gay marriage that were unacceptable to many on the religious right.

He "had a conversion" to the climate cause after a week-long outreach session at Oxford University in 2002 by climate scientist and Methodist John Houghton.

His curiosity undimmed, Cizik has just returned from Iran, where he had an audience with a grand ayatollah. The Islamic leader didn't get round to answering his question about climate change.

Back home, he tells RTCC, many preachers are privately convinced of the case for action but "afraid" to say so. "What the papal encyclical will do is give courage to those evangelicals."

Katharine Hayhoe, a climate scientist and evangelical who takes on many a sceptical audience with a combination of evidence and values, is also cautiously optimistic.

Some 15-25% of evangelicals approve of the Pope but don't accept that people cause climate change, she writes in the Conversation. Those are the ones who might be open to persuasion.

"For any who take the Bible seriously, it must change minds," says Hayhoe. "The encyclical is not proposing any new doctrine; it is not preaching any new message.

Photo: © Preston Rhea |s www.flickr.com

Saint Francis of Assisi, the namesake of the Pope, is cited as an model of "integral ecology" (Enrique Lopez-Tamayo Biosca).
Mural photo: © Jim McIntosh.

"It is simply reminding us that at the foundation of Christianity is one simple word: LOVE. And that word cannot fail to resonate in the hearts of all who believe, regardless of their denomination."

Eco-social justice

In the synagogues of London, says Rabbi Jonathan Wittenberg, "people are absolutely talking about it".

In the Jewish community, he thinks, "the anti-science lobby will not be large… more worrying to me than denial is heedlessness". Jews may think climate change doesn't affect them or comes second to issues like anti-semitism.

Wittenberg, who has solar panels on his house and is hawkish on waste, hopes the encyclical "will galvanise actions that are slow in coming".

The idea of having a responsibility as stewards for the earth is common across Judaism and Christianity – and much of the text cited by the Pope is from the Jewish Bible.

360 rabbis signed their own call for "eco-social justice".

Repairing the world

For Jews, this is a sabbatical year, the one period in seven they are supposed to let the earth rest. While that directive may not be taken literally much outside of Israel, it serves as a caution against overstretching natural resources.

It is tied in with tikkun olam, or "repairing the world", explains Rabbi Lawrence Troster of GreenFaith.

"God is owner and we are tenants. Therefore we don't have the right to abuse creation. We have the right to use it but not at the expense of future generations and not at the expense of other life."

Troster has been writing on Judaism and the environment for decades, but admits it "has never been very central" to his community's agenda.

That is changing: "There have been a lot of grassroots efforts that have been percolating up. It has now really come back to the fore."

Islamic voices

Seyyed Hossein Nasr, a leading Islamic philosopher, has also found his work on the environment slow to take root.

"At first it was a deaf ear from everyone," he says. "My first listeners were Westerners. It is only now that my teachings about the environment are getting traction in the Islamic world."

No religion has the same centralised authority as the Pope. Islam has some voices on the environment, says Nasr, but they are "not at all strong".

"When a preacher goes to preach in the mosque, he has to address what is most urgent for people… It is very difficult to start talking about the environment – you first have to survive. But I don't think this is an excuse. It is a very urgent matter."

Religion does not operate in a vacuum and some of the most devoutly Islamic countries in the world are also the most oil-rich.

That inevitably makes it harder to talk about slashing greenhouse gas emissions, which means phasing out the fossil fuel that made them wealthy.

"Of course these countries like Saudi Arabia don't want to talk about cutting down oil consumption in order to save the planet," says Nasr.

But for those paying attention: "Islam has a vast environmental teaching, which is dovetailed into everyday life."

Indeed, Green Muslims director Colin Christopher tells RTCC he was drawn to Islam about five years ago by its emphasis on conservation and moderation.

Worldwide, Muslims have a month of daytime fasting for Ramadan, one of the five pillars of Islam.

Photo: © MM, www.flickr.com

They abstain from alcohol, are warned against excessive meat-eating and must use water sparingly when they carry out ritual washing before prayer.

"Our harmony with the environment around us is not only going to be an economically smart move," says Christopher, "it is also a spiritually nourishing exercise."

Climate karma

After Christianity, with 2.4 billion adherents and Islam on 1.6 billion, Hinduism is the third biggest religion in the world.

Its 1 billion-odd followers nearly all live in India, where carbon footprints are small more by necessity than choice. Most people eat little or no meat and more than 300 million lack access to electricity.

In this context, the Pope's warnings against wasteful overconsumption have little direct relevance.

"In India, the topic of climate change at the grassroots level is not really in the vocabulary," says Gopal Patel, of Oxford University's Bhumi Project.

To those Hindus who are aware, the encyclical shows that Christians are taking seriously a problem that is having severe impacts on the subcontinent.

Around 20 Hindus are set to attend a conference of young faith leaders on climate change in Rome at the end of the month. It is timed around a march to St Peter's Square celebrating the encyclical.

For Patel, there are important distinctions between the Hindu approach and Abrahamic traditions.

Instead of heaven and hell, Hindus believe in reincarnation. The typical "12 months to save the planet" narratives of Westerners don't really fit with their ideas of cosmic order, he says.

"It is very black and white. Hinduism talks in shades of grey… more in terms of a long term changing of lifestyles."

The modish expression of climate concern among churches is to divest funds from fossil fuels. Patel argues they should look to their diets rather than blaming others.

"Slaughter of billions of animals every single year is a much bigger contributor to the problem," he says. "There is a karmic reaction to that, we are going to suffer for it."

Indian consumption

Whether or not you believe you'll be punished for meat-eating in the next life, it is undeniably a significant factor in global warming.

Animal rearing takes more resources than plant crops, while cows and sheep digesting grass release methane, a potent warming gas.

A quick run of the UK government-backed Global Calculator, which allows anyone to model the impact of different actions on emissions, shows the impact.

If everyone adopted Indian levels of meat consumption, which are 20 times lower than in Europe, it would prevent an estimated 3,480 gigatonnes of CO_2 emissions by 2100. That's a 45% reduction on business as usual, without any other measures.

There may be no mention of meat in the encyclical, but it does invite everyone to join the conversation.

The Pope writes: "I urgently appeal, then, for a new dialogue about how we are shaping the future of our planet. We need a conversation which includes everyone, since the environmental challenge we are undergoing, and its human roots, concern and affect us all."

VENEZUELA: THE CLIMATE PARADOX OF THE PETRO-STATE

Dependent on oil exports, the South American country is fraught with contradictions as it resists overhaul of fossil fuels.

By Alex Pashley

Awash with the world's cheapest gasoline, more oil not less is the way out of Venezuela's economic ruin.

Basic goods shortages, runaway inflation and a debased currency are suffocating Nicolas Maduro's two-year presidency.

As sliding oil prices halt drilling and deprive it of vital export earnings, fossil fuels for the OPEC member with the planet's largest proven oil reserves are everything.

"The Orinoco Belt is the cash cow," Russ Dallen, a Miami-based head bond trader at Caracas Capital Markets, said of the 513 million barrel basin of heavy crude deposits. "Aside oil, the government has no other means of income."

Confronting climate change is decidedly low on the priority list for the country with Latin America's second dirtiest energy sector.

Climate justice fighter

But it is has been a prominent voice throughout years of UN-backed negotiations to broker a global agreement.

Venezuela clamours for rich nations to assume "historic responsibility" in causing climate change, heaping scorn on the United States and the West in appeals for climate justice. Western observers, for their part, see it as a truculent saboteur of climate talks .

Its revered former leader Hugo Chavez said if the climate were a bank, the West would have bailed it out already.

An old car painted in the Venezuelan colours drives through the capital of Caracas in 2006. Fossil fuel subsidies total $12 billion a year.
Photo: © ruurmo I www.flickr.com

Venezuela's lead climate negotiator Claudia Salerno embodies the country's approach to the climate talks. Photo: © IISD Reporting.

Maduro accused wealthy countries of profiteering from pricing pollution, and slammed American fracking at a UN summit in 2014 as environmentally destructive.

"Venezuela's pitching of capitalism versus socialism is a huge oversimplification of the problem of climate change," said Amanda Maxwell, who heads the Latin America programme at the National Resources Defense Council in Washington.

"It's an admirable thing their support for climate justice, but if you deem it and environmental justice to be related, the environmental issues at home really contradict the rhetoric."

Thaw with UN partners

Relationships with Western partners have warmed since the acrimonious Copenhagen summit in 2009, according to chief negotiator, Claudia Salerno, who dramatically cut her palm trying to get attention.

Venezuela protested loudly among other developing nations that a select group of countries had cooked an agreement, embittering years of subsequent talks that are finally set to be signed off this December in Paris.

"The most beautiful thing about Paris is that it will be the end of an exhausting process of negotiation since Copenhagen to here," Salerno told RTCC by phone from Caracas. "Now all the world is willing it."

But old tensions remain.

As up to 200 countries ready pledges to collectively slash greenhouse gas emissions, Venezuela won't back a deal that bullies poorer countries for not cutting enough, Salerno said.

Market mechanisms, which allow pollution permits to be traded, are another red line for the socialist country.

Nor will it bow to the UN climate change organisation's call for pledges by October. It wants to assess all countries' climate plans ahead of the Paris summit, to see how close they get to holding temperature rise to 2C – an internationally agreed aim.

"There is no deadline for Venezuela. If it happens in December, great, but we welcome January also for all countries. You can't remove anybody ex ante because the [UN] secretariat wants a webpage complete," Salerno added.

Oil lifeblood

The country's obduracy hinges on oil's dominance in its economy, which provides 95% of export earnings and a quarter of national income.

Consuming 800,000 barrels a day of petrol and diesel, fossil fuel subsidies total US$12 billion a year. With a gallon of petrol costing about ten cents, people lavish it on gas-guzzling SUVs.

Oil minister Rafael Ramirez has said the cost of supplying refined gasoline for mass consumption is about US$70 a barrel. Oil prices plummeted 60% in the past year to a low of $40 a barrel, and now hover at $60.

The IMF sees Venezuela's economy contracting 7% in 2015 as price inflation rises 96.8%.

"Venezuela sees the global climate regime as a threat to its national interests," Guy Edwards at Brown University's Climate and Development Lab told RTCC.

Beyond big hydropower it has little intention to shift to cleaner forms of energy or stem oil exports which fuels its economy, he added.

Frozen out of capital markets, Venezuela has snapped up a reported $56 billion of Chinese investment since 2005. For China, the draw is not bolivars – which have slid to 170 bolivars to the dollar from 10 in 2012 – but energy security, with payment in oil.

Decarbonisation

There are mounting calls for a long term goal to decarbonise the global economy this century, in line with the 2C warming goal – effectively spelling an end to fossil fuel use.

But Salerno batted away the issue, citing Venezuela's vast rainforests that suck up carbon dioxide.

These carbon sinks together with "low" oil consumption "decarbonised" Venezuela, according to Salerno: its 0.5% share of global emissions is "practically insignificant".

Shipments to the top markets US and China for its oil absolved it of responsibility for the combustion of the dirty fuels, she said.

USGS map of heavy oil resources in the Orinoco. Blue: Orinoco Oil Belt Assessment Unit. Red: East Venezuela Basic Province. Photo: © Courtesy of the U.S. Geological Survey.

Cerro Autana in the Venezuelan Amazon. The country possesses 54 million hectares of primary rainforest. Photo: © Fernando Flores l www.flickr.com

Mural of late leader Hugo Chavez who took office in 1999 and died in 2013. Photo: © David Hernández l www.flickr.com

Almost three-quarters of the country's electricity generation comes from hydropower, although neglect in the face of high running costs had seen diesel-fired plants imported to stem frequent blackouts, Dallen told RTCC.

No very large hydro plants are planned for the next ten years, according to the Hydropower & Dams World Atlas. And more frequent droughts as the planet overheats undercut the reliability of water flow as a source.

Clean energy

Edwards said Venezuela could work together with other Latin American countries to advance the climate agenda. Uruguay seeks to get 95% of its electricity from renewables this year, while Peru and Chile are targeting solar and wind power.

There is little sign of Venezuela joining that movement.

Indeed, it has come under fire for demoting its environment ministry, the first of its kind in Latin America, to become part of the ministry of housing, habitat and "ecosocialism".

Salerno insisted the move strengthened the green agenda; transformation of the country's energy matrix going hand in hand with the "chavista project" to develop rural economies.

"This interconnectivity between economy and ecology doesn't occur in any other country," she said. "We are undergoing a revolution in how we manage nature."

Oil or more oil

In the absence of clear plans for green growth, politicians across the spectrum continue to look to oil for economic salvation.

Chavez nationalised the assets of Exon Mobil, ConocoPhillips and other foreign oilers. Chevron, Repsol, Eni have pledged to tap the Orinoco basin, though companies are in no hurry to get there, given the weak investment environment.

Maduro's popularity is waning, which could give an opening to the centrist opposition leader Henrique Capriles.

But a change at the top would be unlikely to diminish enthusiasm for oil, said Dallen. "The twist of irony is the return of a government that respects property rights and brings investment will lead to more oil production."

Salerno is unapologetic.

"Oil is one of the most marvellous energies in the world. In 200 years it's going to be used for medicine, science, going to the moon," she said.

"It is precious and must be saved for glorious ends, not for making bags to carry back from the market."

DEVELOPMENT: THE BEST KIND OF CLIMATE ADAPTATION?

Experts debate whether reducing poverty should take priority over preparing for specific future changes to the climate

By Leo Barasi in Nairobi

For people living in poor countries, climate change is expected to worsen problems they already face from events like droughts and floods.

The best way of addressing this, according to many experts, is to improve the economic and social development of poor people facing climate change.

It is suggested that, with increased resources, information and better infrastructure they will be better able to cope with extreme weather events.

Some even argue that efforts to stop new investments in coal – cheap, abundant but the leading contributor to global greenhouse gas rises – could hinder progress in developing countries.

So is it a mistake to focus attention on adapting to future changes in the climate, when the priority should be development?

The responses from experts at a conference on climate adaptation organised by the research organisation IIED are mixed.

"I don't think climate should distract from poverty reduction – adaptation should contribute to poverty eradication," Simon Anderson, a climate and development expert, tells RTCC.

The world's major donors provided US$135 billion in official development aid in 2014, a figure that has been rising steadily over the last 15 years.

The Climate Policy Initiative calculated that US$25 billion is spent each year on helping people adapt to threats from climate change.

Poor countries, which receive around half of development aid, are often the most vulnerable to climate change.

Many of these countries are likely to be among the most affected by changes in temperature and rainfall, and are often dependent on agriculture, which is particularly influenced by changes in the climate.

In this context, some experts suggest that the best way of reducing risks from climate change is to promote development for people living in poor countries.

Anderson says, at the moment, "adaptation and development are closely linked".

Reducing poverty

The priority, he argues, should be to maintain the current focus on reducing poverty as a way of building poor people's ability to cope with future changes to the climate.

Anderson points to projects in Ethiopia that were aimed at improving people's food security, which, he says, have now made them better adapted to climate change.

"There was massive investment in improving terraces and digging wells: the intent was food security and it has improved livelihoods", he says.

At least in the short term, he says, "dealing with development deficits may be enough in many cases to overcome climate risks".

In his view, climate adaptation might, over the next few years, involve doing some things that are not responses to changes in the climate and would have been desirable even without climate change.

The suggestion that, in the short term, climate adaptation can sometimes be achieved through development, raises questions about distinctions in international aid between funding for adaptation and other development aid.

The Green Climate Fund aims to channel US$100 billion a year by 2020 to developing countries, of which half will fund climate adaptation.

Some pledges to the Fund, such as that by the UK, have come out of aid budgets, suggesting that some climate adaptation projects may use funding that would otherwise have been spent on development work unrelated to climate change.

Impacts

However, others say they are seeing climate impacts now and so development projects are not necessarily appropriate means of adapting to climate change, even in the short term.

"In Peru, the glacier retreat is accelerating, there are problems with the water supply and hydro power, there are floods, and pests are moving up the hillsides", Karen Price Rios, who works for the NGO CARE, tells RTCC.

Price Rios says these changes are already forcing communities to seek help that would not have been necessary without climate change.

A girl walks throught the flooded streets of her neighbourhood in Haiti's northern city of Cap Haitian. Photo: © UN Photos.

"We're doing a different kind of development project now – the priority for many communities in risk zones is for early-warning systems", she said.

But she adds that communities often also ask for support with projects that she says would be beneficial even in the absence of climate change: "Women in particular want help with alternative businesses like handicrafts".

Anderson and Price Rios agree that, in the long term, climate change will need to be central to development.

"We need climate-resilient development now, but in the future, we will need specific adaptation projects that contribute to development", said Anderson.

Radical adaptation

According to Anderson, the priority for both development and adaptation projects should be to avoid what he calls "climate-induced poverty tipping points", where climate change undoes the gains that have been made in lifting people out of poverty.

"The most vulnerable people now are an analogue for where more people will be later along" as a result of climate change, he says.

Anderson argues that these long-term risks require a different approach, which he terms "radical adaptation – climate adaptation that is far-reaching and far-sighted".

The purpose of this approach, Anderson says, should be to "get everybody ahead of the climate effects curve", so they are better able to survive future climate-related events when they strike.

He says that "radical adaptation" should use existing large-scale tools, like social protection programmes currently used Pakistan, Kenya and Ethiopia, to pre-emptively identify and reduce the impact of future climate pressures that could push people into poverty.

This approach combines a short-term focus on development to reduce poverty with a long-term emphasis on adapting to the threats posed by climate change.

Information

Anderson acknowledges that there can be tension between these short- and long-term approaches.

He returns to the example of the projects in Ethiopia, where he says economic development increased the local demand for water, which was also coming under growing pressure from climate change.

In cases like these, he says studies are needed to understand where short-term development may conflict with long-term climate pressures.

However, he says that when these conflicts are identified, they can be addressed with technologies like those that improve rainwater harvesting.

Price Rios agrees that a lack of long-term climate information often makes it more difficult to make decisions about addressing climate risks.

She notes that such information is becoming increasingly, although adds "we are all still learning about it".

MEET THE UNLIKELY CLIMATE ALLIES BRIDGING DIVIDES IN UN TALKS

Mexico, Switzerland and South Korea form a small but influential group that could be critical in building a Paris deal.

By Megan Darby

International climate talks are typically presented as a struggle between the developed and developing worlds.

The reality is more complex, but there is an undeniable tension between those rich countries responsible for the bulk of historic emissions and the emerging economies that have an increasing impact on the climate.

Much has been made of last year's US-China pact straddling that historic divide and its significance in unblocking agreement at the last round of climate talks in Lima. Less is said about a small negotiating bloc that has been steadily influential in bridging the same gap since 2000.

The environmental integrity group (EIG) is made up of Mexico, Switzerland and South Korea, plus the European principalities of Liechtenstein and Monaco. Negotiators for these unlikely allies tell RTCC the partnership, borne out of frustration with the process, can be a strong advocate for progressive climate policies.

Spanning three continents and three time zones, as well as the firewall between developed and emerging economies, the group has a reach like no other.

As the European Union seeks to position itself as the bridge-builder in UN climate talks ahead of this December's critical summit in Paris, this small but significant group could give them a run for their money.

Swiss initiative

The group was conceived during negotiations for the Kyoto Protocol, when countries not part of any bloc were shut out of certain conversations.

Franz Perrez, environmental ambassador for Switzerland, explains: "There was a moment when negotiations moved to a smaller setting, where only some groups were permitted to engage and we were not part of that."

His predecessor was escorted out of the room, while representatives of formal groups stayed – an "unacceptable" situation to Switzerland.

Famously for its neutrality, Switzerland never joined the European Union that surrounds it on all sides. Nor did it agree, at the time, with the Umbrella Group, which covered most other developed countries including the US, Australia and Japan.

"These groups did not feel like home," says Perrez.

So Switzerland declared its intention to form a new group and invited other unaffiliated countries to join.

Outgrowing the G77

For Mexico and South Korea, the issue was that their economies had outgrown the G77, which represented the developing world.

Now firmly in the upper-middle income category, Mexico was accepted into the OECD in 1994 and South Korea followed two years later.

When it came to climate talks, Roberto Dondisch, director general of global issues in Mexico's foreign office, says: "We were being left out of the process.

"Although Mexico carries weight, it is not the same as having an official group."

The dynamics of UN climate talks have changed since the EIG formed in 2000. The importance attached to formal blocs has waned and several unofficial alliances claim a similar status.

For example in 2012 six Latin American countries including Peru, Costa Rica and Panama formed AILAC, which might seem a more obvious home for Mexico.

But while Mexico consults with AILAC, its primary allegiance remains with the EIG.

The EIG is valuable as a "microcosm" of the talks, says Dondisch. "If we can get together and agree on something internally, often we can get to deals that are acceptable for almost everyone.

"That was certainly the case [at the last round of UN talks] in Lima, where some of the language that you see in the final document came out of the EIG."

Strength in diversity

Jai-chul Choi, South Korea's ambassador for climate change, echoes that view. It is "a group of diversity" he says, that can help to find common ground between blocs with different interests.

"When we have internal consultation among the EIG, the negotiation is very tough," he says.

"Korea plays a sort of mediating role between Switzerland and Mexico and finally we reach a common text."

For example in Lima, Choi says the group helped forge a last-minute compromise on "loss and damage". This was the contentious issue that dominated the previous year's talks in Warsaw, of compensation to countries experiencing climate impacts they cannot adapt to.

Switzerland, in common with most of the developed world, was resistant to its inclusion in the Lima deal, while Mexico was strongly in favour.

The formula they came up with, which acknowledged the Warsaw decision without adding to it, was enough to keep the show on the road.

Ambition

What keeps the group together, despite its members' different interests, is a determination to play a constructive role in the talks.

"On certain areas, we have very similar positions," says Perrez. "The name 'environmental integrity group' has become a guiding principle."

Each country boasts a relatively ambitious climate policy.

In line with the European Union, Switzerland is targeting a 20% cut in emissions from 1990 levels by 2020.

Mexico has been among the most vocal champions of green growth and last year became the first Latin American country to introduce a carbon tax.

Dondisch says: "We don't see green development as a hurdle, we see it as an area of opportunity."

And South Korea this month launched Asia's first national carbon market – a "big strike" for the country's climate policy, Choi says.

"At the moment, Korean society is very dependent on fossil fuels. By launching the carbon market, every Korean industry is making some complaint but we want to give them a signal on a long term basis.

"As a country, in particular without any energy sources, we have to move towards a low carbon economy."

Broad participation

In Paris, the group is seeking a legally binding deal with "broad participation".

That means refusing to perpetuate a hard division between rich and poor. Or to be more precise, a division between the "annex 1" countries expected to cut emissions under the Kyoto Protocol and the rest.

Annex 1 is a list of countries who were in the OECD back in 1991 plus former Soviet states. The EIG agrees with the US that a more nuanced view of countries' climate obligations is in order.

"Differentiation has to reflect the realities," says Perrez. That means emerging economies, with their increasingly substantial emissions, shouldering some of the responsibility. (For Liechtenstein and Monaco, with a combined population of 75,000, it also means cutting small countries some slack.)

The EIG, with its members including non-annex 1 countries, can make that argument with more credibility than a purely developed bloc.

China, despite committing to limit its own emissions, has been curiously reluctant to require other emerging economies to do the same. In Lima, it continued to back the "like-minded developing countries," which opposed changes to the way differentiation was framed.

"The outcome of a Paris conference should be balanced in terms of development need and environmental integrity," says Choi.

"The EIG is in the best position to facilitate the negotiations due to its membership."

South Korea is upping its engagement with China and Singapore, he adds.

Listening

The group still has its internal differences, particularly on issues like cash support for poor countries to cut emissions and adapt to climate change.

They agree on broadening the donor base, with all members contributing to the UN-backed Green Climate Fund.

But Switzerland was branded "fossil of the day" by NGOs in Lima for its opposition to legally binding commitments on climate finance.

"It was important we didn't have expectations that would never be fulfilled," says Perrez in Switzerland's defence.

It is not the biggest or most economically mighty group, but its unique geographic and economic mix mean it can punch above its weight.

"None of us have the impression the world cannot move without us," says Perrez. "We have to listen to others outside our group in order to have an impact."

DIANA HOLDING: MOROCCO'S GREEN STANDARD

Over the past 50 years, Diana Holding has continued to strengthen and develop its presence in Morocco to become a key player in the Food and Beverages sector.

Founded in 1956, the group has diversified businesses in agriculture, wine-making, bottling of water and soft drinks, trading and distribution. In June, the group became majority shareholder of Belvédère spirits.

CEO Rita Zniber, who has led the a $3 billion (annual sales) agro-industrial conglomerate Diana Holdings since April 2014, built her reputation as a sharp business person with a mission to make her company a global player in the production of wines and spirits. The Zniber brand is well known as the top vintner in Morocco, with over 6,500 employees.

In 1992 she established the Rita Zniber Foundation, a non-profit organsation working

DIANA HOLDING KEY SEGMENT HIGHLIGHTS:

Wine & Spirits segment
- MAD 1 billion of revenues[1]
- 74% of the Moroccan wine production
- 26% of the alcoholic beverage distribution market
- 1,600 distribution sites reached
- Over 600 product references

Soft Drinks segment
- MAD 793 million of revenues[1]
- 2nd largest Coca Cola bottler in Morocco
- 95% market share in own territory
- 22% market share in Morocco overall
- 35,000 sale points reached bi-weekly

Poultry segment
- MAD 652 million of revenues[1]
- 4th largest animal feed producer
- 2nd largest day-old laying hens producer
- 8 million chicks sold annually

Agriculture segment
- MAD 174 million of revenues[1]
- 2nd largest agricultural domain in Morocco
- 30 products across 300 varieties
- 5 production regions in Morocco

with orphaned children. Today the foundation has two centres providing homes to 350 children until their adoption.

Beyond its industrial vocation, Diana Holding takes its Group's Corporate Social Responsibility Company seriously. It has been an official partner of the Cœur de Gazelles association since 2010. A non-profit organization, Cœur de Gazelles arose out of the Rallye Aïcha des Gazelles du Moroc in 2001.

The association is deeply committed to providing local people with the help they need while fostering sustainable development. By working with and for the most disadvantaged its actions enable local people to become agents of their own development.

Diana Holding is convinced that its future depends on having a real commitment to the community, whilst keeping the environment at the heart of its concerns.

www.dianaholding.com

Children at one of the centres. Photo: © Foundation Rita Zniber.

Diana Holding

Source: Company information, 2014 consolidated financial statements
Note: 1. Revenues on consolidated basis

Photo: © Jean-Marc Astesana.

DRIVING SUSTAINABILITY IN THE AUTO INDUSTRY

Nobuaki Katoh, President and CEO, DENSO Corporation explains why he wants the company to become one that can make even greater contributions to society.

The DENSO Group has formulated guidelines and visions at each stage of management and has continued to achieve growth while responding to changes in the business environment. With DENSO VISION 2015 serving as our guideline, since 2004 we have addressed various business and corporate social responsibility (CSR) issues. In my own mind, however, the question of "what DENSO must do to ensure it remains a company essential to society in the future" is one theme that has gradually become increasingly important.

Each and every DENSO associate, myself included, wishes to see DENSO become a company that plays a leading role in helping to solve a variety of issues in society as well as a trustworthy company in harmony with people in local communities.

To become such a company, we must focus closely on long-term social changes, create our ideal images of society and the Company, clarify issues that need to be solved and boldly take on new challenges toward attaining our targets. For these reasons, I have asked associates in each region of the world to consider various issues and the Goal of the DENSO Group in 2020 based on the expected social changes in the future.

In the near future, the global population is projected to reach 8 billion, while the amount of CO2 emissions resulting from human activities is expected to increase to 3.5 times (2.5 times in 2011) the planet's absorption capabilities. Additionally, in today's automotive society,

> We aim to become a global company with high aspirations to contribute to the world and be trusted by people

Nobuaki Katoh, President and CEO, DENSO Corporation

the number of cars owned has climbed to 1.5 billion (1.5 times the number in 2010). At this rate, the number of traffic accidents will also rise and two million people are expected to lose their lives each year.

I believe that a sustainable society capable of solving issues such as these is a society that does not push the planet to the brink and where people can live enriched lives. In working to achieve this, we have created our image of an ideal society in 2020 that envisions "Preserve the planet" and "Security and Safety."

The DENSO Group has declared that we will take our utmost efforts in environmental fields to reduce environmental impacts on society as a whole by focusing on fuel efficiency, CO2 reductions and energy saving, energy creation and energy storage technologies.

In the future, every associate in the DENSO Group will take to heart our slogan of "Protecting lives, Preserving the planet, and Preparing a bright future for generations to come" and directly tackle a host of issues facing society while actively being involved in finding solutions.

www.globaldenso.com/en

DENSO

SHARED MOBILITY: THE FUTURE OF TRANSPORT

Well-designed car and bike sharing systems result in fewer car journeys, not more, writes Arnd Bätzner from the Mobility Cooperative.

Individual mobility today is still car-based in many regions of the world. Meanwhile, city administrations struggle in keeping public transport systems as attractive as individual car travel. Car sharing has proven to be an ideal complement to those who like the comfort and independence of using an individual car without having to own one and without having to drive the full distance.

Users of car sharing services greatly improve their ecological footprint. Transport is an integral part of today's urban infrastructure; and car sharing can be a major development tool leveraging its potential. Research shows that a high-quality perception of infrastructure results in an implicit acknowledgement across all classes of population.

Poor infrastructure, often found in low income zones, particularly regarding education or transport facilities, results in widespread structural problems. Infrastructure systems as whole entities appear prefereable to funding isolated "clean-car projects".

Transportation systems are most efficient when they are the result of a holistic approach integrating all modes, combining their specific advantages. This includes shared vehicle modes.

Sharing versus on demand

Car sharing is part of the sharing economy, not to be confused with "on demand economy." The sharing economy, according to Rachel Botsman who coined the phrase, is an economic system based on sharing underused assets or services for free or for monetary benefits.

On-demand services, on the other hand, are "...platforms that directly match customer needs with providers to immediately deliver goods and services..." (Botsman, 2015). These platforms generally do not operate any physical infrastructure other than IT systems.

All operational risks are outsourced to service providers. Typical examples for on demand economies are "transportation network companies" (TNCs), platforms serving as marketplaces for taxi-like services. Generally they do not share underutilized assets, but generate new trips if new demand arises.

This is not the same as ridesharing where passengers are matched to free seats in cars for automobile trips that would be taken anyway. TNCs often encourage owners to keep their vehicles by offering opportunities to generate additional income

Sharing is more than caring

We're the premier car sharing and fleet management specialists from Switzerland, providing end-to-end software solutions and business consultancy for over 25 years. Find out what it means to share more than just technology:

www.mobility-systems-and-services.com

using them for driving third parties around. Some of these journeys replace rides on transit systems.

Transit systems, however, need to be in place and require sufficient passengers to provide frequent service even to those who are dependent on mobility but cannot afford TNC services.

Saving space, time
Up to 10 individually-owned vehicles are taken off the road by one shared car.

Car sharing comes in two flavours: “return car sharing”, where the cars have dedicated parking spaces, and “free-floating car sharing”, where cars can be dropped at any legal parking space within a predefined area of operation.

The goal is to save on space and time, the two major assets of contemporary urban life. Every person, once in a while, has mobility needs for which a car will be the best solution. These have to be accommodated.

When truly efficient, shared mobility complements and connects to mass transit. Customers riding mass transit for daily routine trips will have access to a car or bike whenever they need one, wherever they need one with no need to own one.

Well-designed car and bike sharing systems thus result in lesser car journeys, not more. Towards a fully integrated Public Transit Offer car sharing must be an integral part of a public transit offer accessible through one single integrated, easily usable mobility planning, ticketing and invoicing interface. This is the Swiss approach to integrated mobility.

Over a century ago, different railway companies decided to offer integrated ticketing to their customers. Since then, the approaches have been taken further. Today all other

transit modes such as urban and alpine buses, tramways, boats on the lakes, cable cars in mountainous regions and car sharing services are included and accessible through one smart farecard.

The key is that services are frequent, departure and arrival times of different modes carefully harmonized and coordinated even in the event of a service disruption: a connecting bus in a remote area will wait for a train running late.

Car sharing vehicles are available in both dense urban areas and in rural zones, as nationwide 24/7 self-service operation. A customer arriving on a late train will find a car to drive the last miles to his final destination.

Unlike the parallel structures created by TNCs, the transit system including shared modes and other forms of paratransit is accessible to all, everywhere, for a moderate fare and at any given time.

Transit systems for wealthy nations
While transit should offer premium classes of service and optional comfort upgrades wherever a demand exists or can be created, the idea of sharing the same infrastructure is one of deep solidarity within a society.

Riding transit at off hours, a wealthy customer who could afford a car service contributes to maintaining a public infrastructure, while he himself benefits from speed and reliability advantages.

The macro-economic fallouts from powerful and efficient mobility systems – increased reliability, reduction in working hours lost, better projectable business transactions, more quality time for families – can be considered to be one of the keys to Switzerland’s long-term global success.

As the inventor and world champion of inter-modality, Switzerland is an intuitive example of a countrywide interconnected transit system. It is a global pioneer of car sharing and has, in over 25 years, built up the nationwide shared vehicle offer. Seamless integration leverages transit wherever the comfort of a car is needed.

Mobility car sharing Switzerland operates both station-based and free-floating car sharing systems in order to provide the best suited services in any given location. Running and offering its own software as a white-label product, Mobility shares its knowledge and experience globally.

Mobility Systems + Services
Mobility Systems + Services is the IT subsidiary of the Swiss Mobility cooperative. It provides end-to-end software solutions and business consultancy. Its custom-designed car sharing software MobiSys supports medium and large car sharing organizations and fleets. It handles more than 2.2 million booking translations a year and is distributed worldwide. MobiSys 2.0 is available under a “software as a service” license.

www.mobility-systems-and-services.com

mobility
systems+services

ECOFROTAS: BRAZIL'S GREEN CAR COMPANY

A Brazilian leader company in fleet management has generated the world's first carbon credits for the use of ethanol and developed a program that allows its clients to go green and cut costs.

The ethanol produced from sugarcane is an unquestionable source of wealth for the country.

In addition to generating income in agriculture, its use replacing fossil fuels reduces the environmental impact on the transportation industry, because the burning of biofuel is considered as neutral in terms of greenhouse gas emissions.

This aspect is particularly important because in recent years the transportation industry has had the highest growth rates in energy consumption – currently it is responsible for 27% of the country's consumption matrix, according to the Center for Sustainability Studies at Fundação Getulio Vargas. Furthermore, the Brazilian CO2 emissions reflect this development.

In this scenario, initiatives that boost the use of ethanol by fleets are extremely important when we consider the need to achieve a low-carbon economy. Thus, biofuels are a crucial part of the sustainable management strategy at Ecofrotas, market leader in Brazil for fleet management.

Sustainable fleet

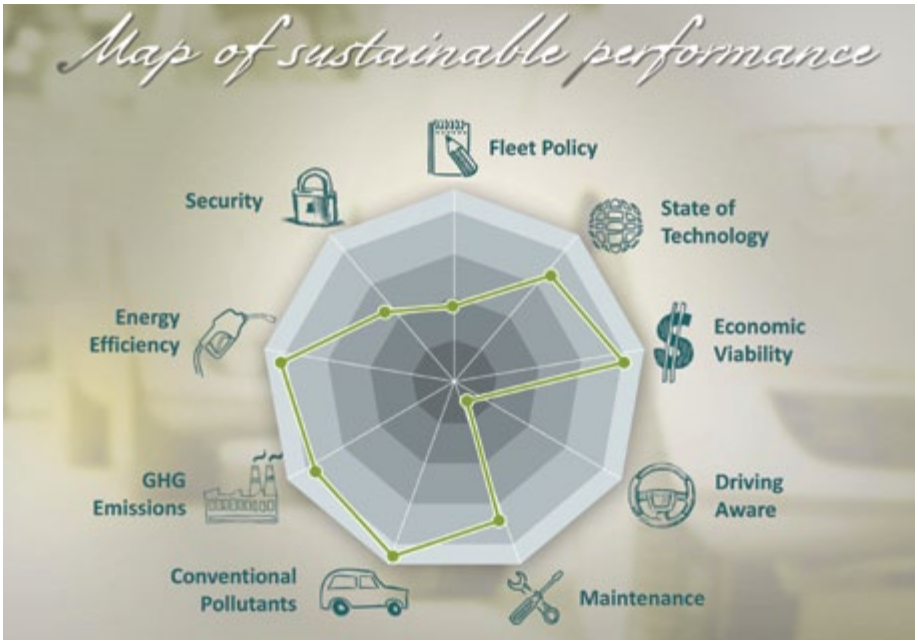
The company has developed the Sustainable Fleet program which, based on measurable performance indicators, allows for the continuous improvement of the fleet management process.

This project aims at making the evolution of the sustainable fleet management process a possibility. The indicators include fleet policy, state of the technology used, vehicle maintenance, pollutants emission (including greenhouse gases), safety and driver training, among others.

The first stage of the process, is about mapping the fleet status, attributing scores to each of the indicators that are being considered. Afterwards, we identify opportunities for improvement and define an action plan indicating what needs to be done so that the fleet achieves the sustainability standards that are considered optimal for the category.

The last stage includes the implementation of these improvements. Once the cycle is finished, there is reassessment, which allows for the evolution of the process. Thus, the company can check which vehicles need attention and compare whether they are more or less efficient than the average competitor.

Ecofrotas is the Brazilian leader in fleet management, focusing on reducing environmental costs, risks and impact. Voted the most sustainable company in the sector, it manages 860,000 vehicles from 14,700 customers and has more than 17,000 gas stations and 15,000 accredited workshops in Brazil.



Greening innovation

Ecofrotas spent three years developing the first methodology in the world dealing specifically with generation of carbon credit in the transportation segment. In 2012, the methodology was approved by Verified Carbon Standards (VCS).

These and other initiatives stem from the assumption that sustainability is not an impediment or an obstacle to be overcome, but rather an ally, considering the opportunities we have with biofuels in Brazil.

And this is all done with the perspective that the action can encourage other companies to look for alternatives to reduce emissions involving their customer chain, contributing to create a more sustainable society.

www.ecofrotas.com.br

WALKING THE TALK: IT'S TIME TO BACK CLIMATE ACTION WITH CASH

The oil industry must not only focus on oil production but also in implementing economically viable processes to enable a transformation from "waste" such as gas that is being flared to clean marketable products.

To cement a place in a world that demands sustainable long term solutions oil companies are facing the challenge of evolving from simply producing oil to becoming energy companies focused on creating 'win-win' scenarios for all stakeholders. Gone are the days when a "marketing makeup and facelift" could pave the way for "business as usual" simply presented in different packages.

More and more one perceives that policy and decision makers on a world stage lay out objectives and (non) binding agreements without paving the way for funding, local competence and other essentials. Concrete project funding is the only way to provide the deliverables and potential game changers required to meet global objectives and commitments.

Unfortunately the gap between policy makers and people who actually can get things done is widening in part due to: i) policy makers and the "hands-on" people speaking different languages (the voices of the hands-on people are usually absent at high-level meetings, ii) in a cash restricted market "energy efficiency" is most often not high on the pecking order of an oil company (energy efficiency requires long term "out of the box" thinking) and iii) some decision makers within oil companies perceive

Power Generation Plant, Central Production Facilities CPF, Block 15.

energy efficiency projects as "fund parasites" that threaten their core business.

Most energy efficiency programs therefore are either driven by regulations, consumer pressure (public opinion) or need some (external) incentive to transition from "conference talk" to boots on the ground. The exception being when energy efficiency is detrimental to the survival of the company; such as is the case in the manufacturing industry.

Why is energy efficiency a fact of life in the airline industry, "downstream" oil industry (mainly refineries), utility companies, and car industry but not in the "upstream" oil industry? The answer lies, amongst other arguments, in the following line of thinking:

- The "upstream" oil industry is **not subject to a competitive environment**; each drop of oil eventually will find its way to the market (at whatever price dictated by the market).
- **There is no "green oil" for which a customer is willing to pay a premium or "black oil" for which there is no market**.
- Anything "upstream" in the oil industry is usually developed on an **individual and local scale; not conceptualized on having a "lasting impact"** and **contributing to the prosperous development of a mayor region** (beyond the border of an oil field(s)).
- There is a lack of a "project clustering" approach (transition from a "project" to a "program" approach) thereby often making it difficult to meet the "critical mass" (economy of scale) hurdle.
- Investors often look for short term returns; not lasting positive impacts (even after it has served its initial main purpose).

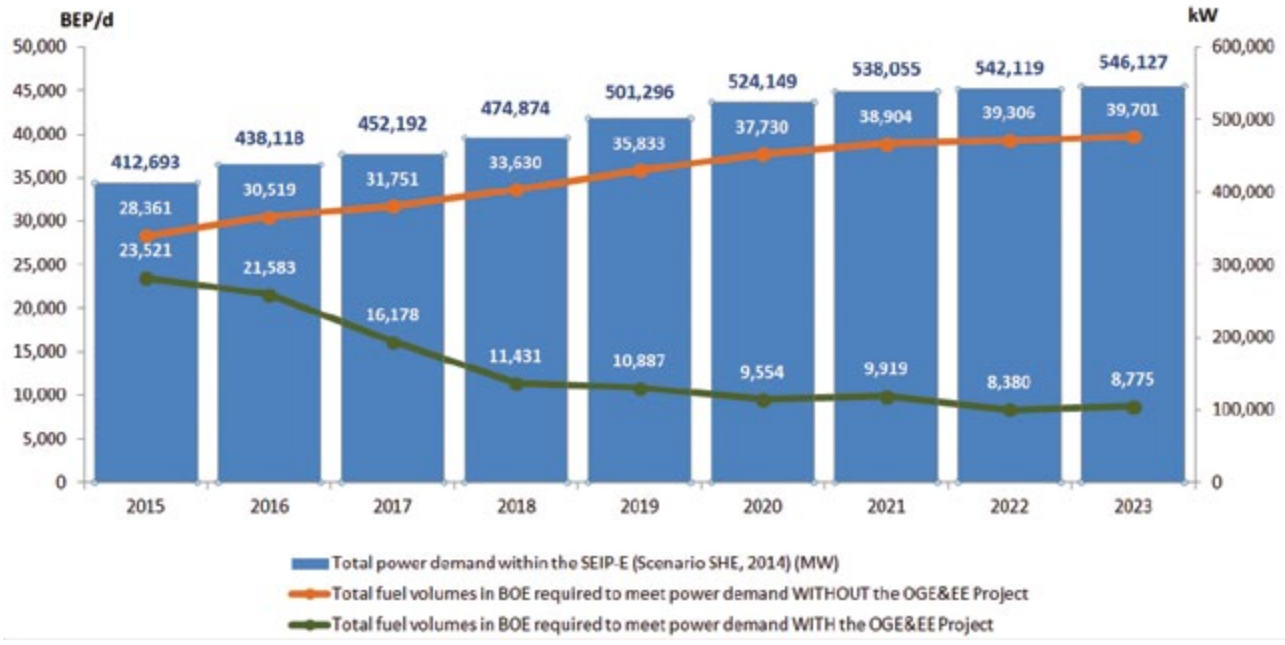
By means of the OGE&EE (Optimización Generación Eléctrica & Eficiencia Energética) Program "Ecuador is transitioning its oil industry to a low carbon footprint through energy efficiency" thereby creating a "win – win" scenario for all stakeholders. This program requires a 1.2 billon US $ investment (of which US $ 600,000,000 has already been investment) consisting of a cluster of 120 projects (power generation, power distribution and transmission, gas gathering and transportation, improvements, research and development, etc.) in an area covering 25,000 km², 17 oil blocks, 56 oil fields and 66 facilities.

Despite the fact that the OGE&EE Program generates tremendous benefits to the country and the global environment (potential to reduce up to 800,000 tons of CO2 per year) it was not an easy sell. To develop a project cluster at this scale it is necessary to breakdown "old habits" and corporate cultures and translates the concept (OGE&EE) into industry language.

The narrow and short term thinking has resulted in oil companies flaring millions of standard cubic feet of associated gas on a world wide scale (gas which is freed when oil is extracted from its reservoirs). **To a great degree this is the result of a lack of (outside) awareness due to the fact that oil companies register and report production, not "waste"** (energy efficiency opportunities). Due to a lack of independent third party auditing procedures and reporting, consumer opinion / perception is mainly driven by marketing efforts of the industry ("whatever you say goes" unless some specific incident goes viral through the social media).

For some the environmental benefits of optimizing associated gas (not flaring it) in and of itself is a good enough selling point. Nonetheless, in a world where thousands

ENERGY EFFICIENCY TRANSLATES INTO INCREASING NET BARREL OIL EQUIVALENT (BOE) VOLUME



of projects and programs compete for limited funding it is a essential to develop business cases based on a "win – win" scenario and "unique selling positions". The chart shows the impact of the OGE&EE Program on net oil production in Barrels of Oil Equivalent (BOE) on a country level. The orange line shows the amount of BOE required as fuel to power the oil industry without the OGE&EE Program and the green line the BOE/ day required as fuel as a result of the Energy Efficiency Program.

By interconnecting the future integrated electric system of the oil industry to the national grid it frees the way to "transform water into oil" by optimizing excess hydro power during "off-peak" hours.

The OGE&EE Program proves that increasing oil reserves is not only achieved by means of exploration but also by means of energy efficiency (the OGE&EE Program translates into increasing the net oil output by as much as 30,000 BOE/day or > 200,000,000 bbl. reserve over a 20 year period).

Unfortunately emissions reduction initiatives in the oil industry are now faced with the next significant hurdle, namely, it is one thing to redirect funds within the oil industry from traditional oil exploration and production to "energy efficiency" programs with crude oil prices hovering in the range of 80 to 100 $/bbl. and something completely different with oil prices at levels as it seen them today. It is during these times that bridges need to be put in place between objectives discussed at high level meetings and projects and programs that deliver on the promises made. Various programs and mechanisms on international and regional scale (still) have not delivered leaving it purely up to Ecuador and Petroamazonas EP to "walk the talk".

Given the urgency to reduce emissions, implement sustainable solutions, creating "win – win" scenarios, etc. it is essential to implement funding structures allowing to transition from high level non-binding commitments to technically and economically viable solutions. This will require strong top down commitments, local competence and integrity with hands on tools (including funding) helping programs like OGE&EE weather storms any project will face over a 8 – 10 year implementation period.

www.petroamazonas.gob.ec

PETROAMAZONAS EP

Heat and Power Generation Plant, Eden Production Facilities EPF, Block 12.

Power Control Room, Eden Production Facilities EPF, Block 12.

SOLUTIONS FOR LARGE-SCALE ENERGY STORAGE

Energy storage is recognized as the key enabler for achieving high penetration of renewable energy. A cost-efficient and environmentally friendly technology is now available for commercial roll-out.

The company
Established in Oslo, Norway, in 2011, EnergyNest (earlier NEST) is commercializing a new technical solution for large-scale energy storage. Initially the company focused on thermal storage for CSP (Concentrated Solar Power) while it has now developed a series of large-scale energy storage solutions with applications to a wide specter of applications associated with renewable and conventional energy production. With a highly qualified staff the company is actively collaborating with leading universities and research institutions around the world.

The storage challenge
Most renewable energy sources, especially from solar and wind, are intermittent by nature. They produce electricity according to availability of sun and wind, not governed by real-time demand. Therefore, the ability to store renewable energy in times of excess, and supply energy when it is in demand, is key for improving the efficiency and flexibility of renewable energy systems, and thereby achieve a more reliable and sustainable energy supply. Implementing and establishing large-scale energy storage solutions is, in the long run, a prerequisite for reducing and ultimately also phasing out fossil fuels from the energy supply mix.

Current technologies for large-scale energy storage face severe limitations. Significant advances in performance and cost have been made in chargeable batteries; however, this technology is less suited for large-scale storage because of cost, safety and environmental issues, as well limited life span and cycling capacity. Also molten salt heat storage is limited by lack of flexibility, operational challenges and comparatively high cost. Pumped hydro storage (PHS) and compressed air energy storage (CAES) are attractive solutions but are unfortunately limited by geological and topographical conditions and are thus not generally available as a world-wide solution.

EnergyNest's solution
EnergyNest stores energy in the form of high temperature heat in a solid state medium. The TES (Thermal Energy Storage) uses a special type of concrete termed Heatcrete® that is based on readily available but specific types of sand and gravel in combinations with binding compound; this material has superior thermal and mechanical properties compared with normal structural concretes. In connection with charge and discharge of the storage the thermal energy is transported

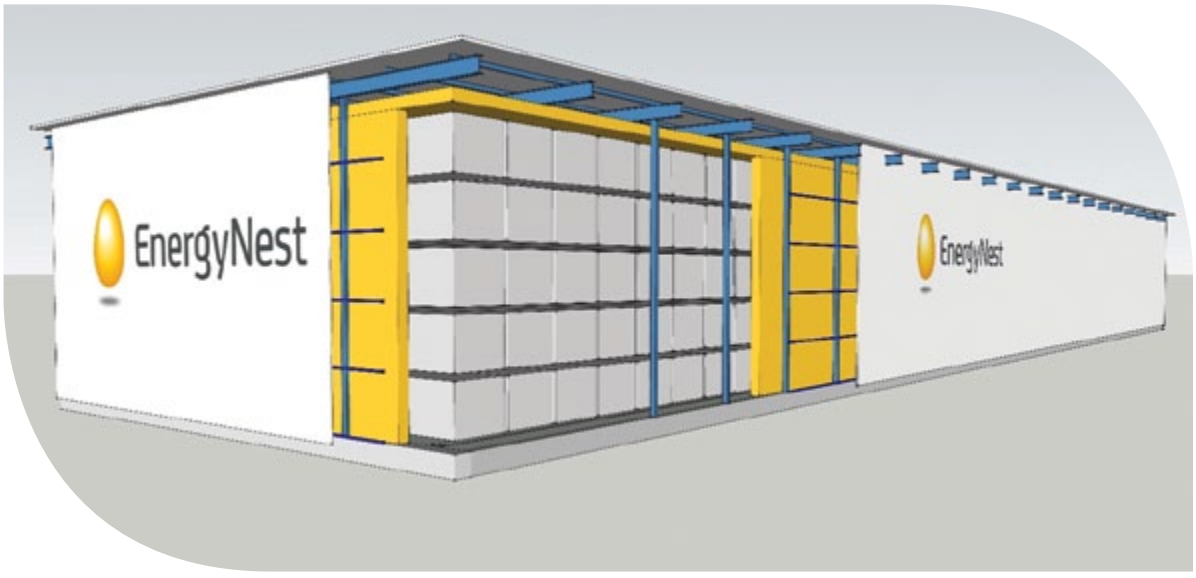


Figure 1: Illustration of a 730 MWh thermal energy storage. Approximate measures are 105 x 25 x 12 meter.

in and out of the storage by way of fluid within heat exchangers. There is in practice almost no limit to the number of storage cycles that can be sustained.

Conceptually EnergyNest's TES is based on a smart "Lego system" design where "thermal batteries" are clustered together in prefabricated cassettes; these are stacked together in a very compact way inside a simple storage structure. Alternatively, if desired the storage may be placed underground. The size and dimensions of a storage unit is completely flexible and may be built for purpose; the capacity may typically vary from 10 MWh to several

EnergyNEST AS (previously NEST AS) delivers a breakthrough energy storage technology that is fully scalable and cost efficient and that can be built anywhere. The technology is based on use of readily available earth materials and has wide applications within storage of renewable as well as conventional energy; it can also make traditional power production and transmission systems more efficient and reliable.

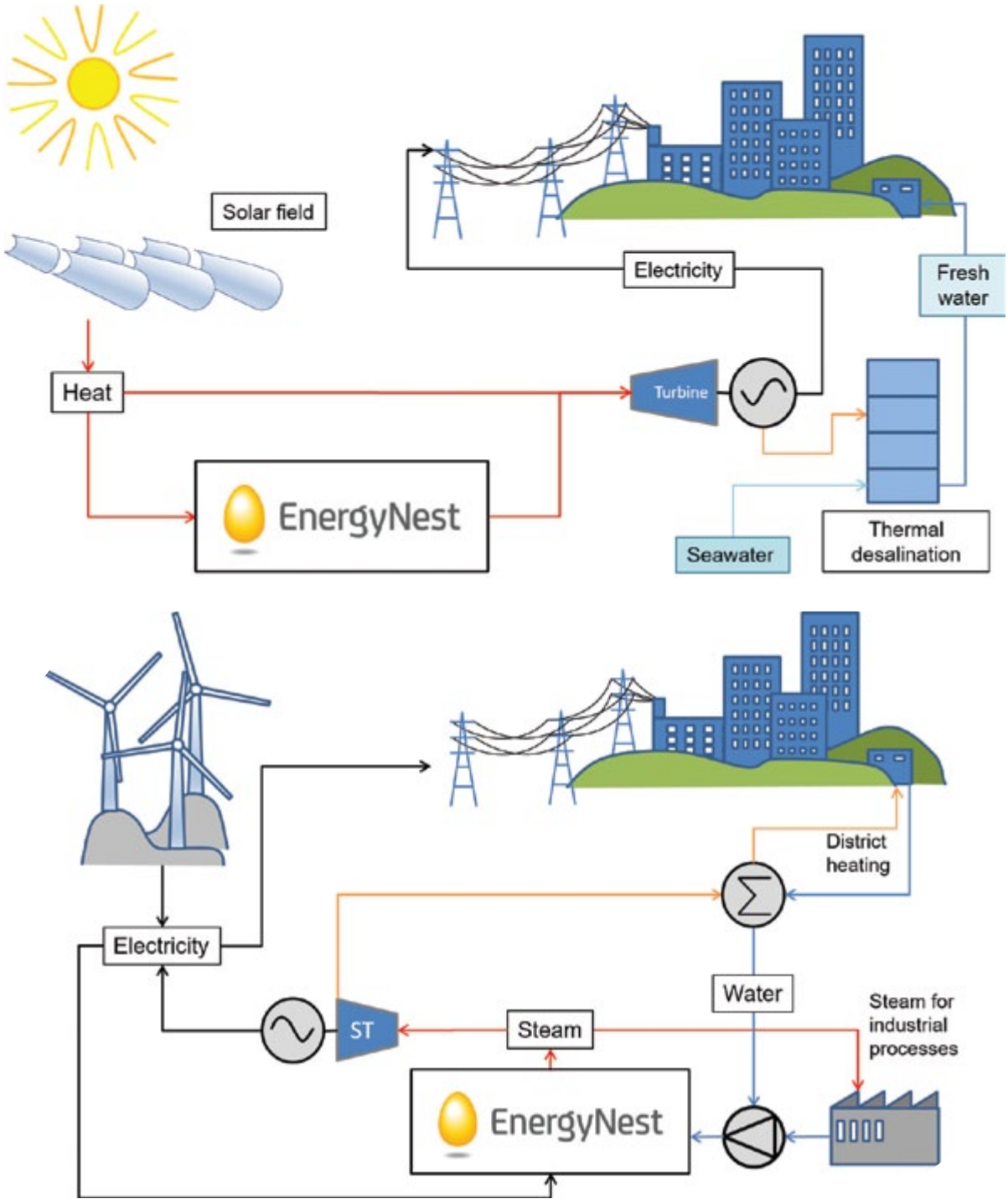


Figure 2: Diagrams for different types of applications with EnergyNest storage.

GWh and qualifies as grid-size storage. An illustration of a 730 MWhth storage is shown in Figure 1.

Applications

The ideal setting for use of the storage is when the energy source is thermal, such as for concentrated solar power or a conventional thermal power plant; the energy loss during a storage cycle is then almost negligible. Another direct thermal application is adding storage to waste heat recovery (WHR) systems; this is applicable for a range of industrial processes. With storage, WHR systems can produce electricity on-demand. The technology is also suitable for direct electric input when connected to the power grid. This is especially interesting in areas with high penetration of variable renewable electricity sources such as wind and solar photovoltaics (PV). In this case the storage does not necessarily have to be co-located with the power plant, but rather strategically placed where it adds the most value to the grid. Conversion from electricity to heat in a heat transfer fluid is simple and effective whereas the efficiency of regeneration of electricity via steam turbine generators is bound by the limits of thermodynamics. However, very high overall energy efficiency may be obtained by use of the waste heat from the steam cycle for moderate temperature applications such as seawater desalination or district heating, in a combined heat and power mode. The storage also opens up the possibility to deliver high temperature process steam to industries on a continuous basis, generated by variable renewable energy.

EnergyNest's TES solution may be applied to a number of critical utility applications beyond power production. One such application is the use of renewable energy sources, for example CSP, for the production of potable water from salty or polluted water. During desalination, heat is used to vaporize seawater pumped from the ocean to create clean drinking water, thereby providing security of delivery and access to healthy water on a large scale around the clock.

Pilot storage

EnergyNest recently completed a "first of its kind" 1MWhth prototype TES at the solar research -hub in Masdar city in Abu Dhabi, UAE. The TES is connected to Masdar Institute's solar thermal energy collection system, also referred to as a "Beam Down" system. Although EnergyNest's storage is relatively small and has been built primarily for research and demonstration purposes, it is fully capable of emulating the operations and performance of a full size storage system. The pilot TES at Masdar is heavily instrumented and monitored, and is currently undergoing extensive testing and comparison to numerical simulations of performance leading to full verification of the technology.

Environmental impact and green economy

The great challenge ahead is clearly to make everyone accept that to avoid severe climatic changes and to save the environment bold new measures on a very broad scale must be taken. This means political decisions, better framework and stimulation of the green economy, incentivizing new environmentally friendly technologies, as well as daily choices to be made by each and every one of us. During recent years there has been strong growth of "green technologies" and "green economy" simply because this is what we must do to head towards a more sustainable society. We believe energy storage will play an increasingly important role as a key component in a greener and more reliable energy supply system and as an integral component in providing heat for industrial processes and for homes. High temperature thermal heat storages can be built anywhere, use environmentally friendly materials, and are fully scalable to any need; this means that a new and important solution towards a greener society now is ready to be implemented on a broad scale.

http://energy-nest.com

EnergyNest

Figure 3: Beam-down tower at Masdar Institute, and EnergyNest thermal energy storage pilot.

INNOVATING WASTE: MEXICO CITY'S GREENER, CLEANER FUTURE

Suema is a ground-breaking and innovative Mexican company. We make energy-related technologies that support sustainable development and promote climate resilience.

This year Mexico City's 22 million residents are celebrating its 190th anniversary.

In its history there have been stresses that caused serious problems for its inhabitants and infrastructure. One way or another, these have been managed, but there still exists a need to address the structural problems.

Cities depend on rural zones as these are major producers of raw materials and natural services. This is an intrinsic relationship that has to be carefully considered. Mexico City is primarily dependant on food production outside its perimeters.

Less than 1% of the local economic activity is related to agriculture. So, distribution and commercialization of fresh food products is a sensitive matter for millions of citizens.

Since the times of the ancient city of Mexico Tenochtitlan, markets have played an important role for social and economic development. Through the years markets have forged traditions and customs, representing a legacy for Mexican culture.

According to Mexico City's local government, markets represent around 27% of local retail commerce. They are still the main source of provision for fresh food and staple products among the population of lower income. At the same time, they draw people together and foster communities.

However, markets also generate negative externalities to the environment, which have global impacts. Every day, market traders throw away about 15% of the municipal waste, a major source of methane.

Photo: © Suema

Photo: © Suema

Waste is often left in containers at the market for long periods of time, creating a bad image for the markets and are a potential health risk. In several places in Mexico there are now waste separation programs that provide a specific treatment for the waste.

Yet despite years of effort and investment these programmes have suffered lack of effective sustainable criterions and demand surveillance and constant incentives, maintained with public expenditure.

Waste management and urban policy

Every day there is less and less space available to satisfy all the demands of a growing population, such as housing, employment and recreational and conservation areas.

Mexico City does not have landfills in operation. It does not have an adequate infrastructure for tackling environmental and social concerns in providing a clean environment.

This is a chronic issue for human and community development that usually affects most cities. Efficient use of waste can generate economic growth and provide clean energy, avoiding waste to become an environmental liability for the neighbourhoods and the rural areas where landfills are usually based.

Implementing a waste-to-energy project alongside markets could reduce waste collection trips and turn waste management into a productive activity.

But even more important: these waste-to-energy projects reward people them with direct benefits for separating waste.

Photo: © Suema

Photo: © Suema

The energy produced is utilised for lighting up their work space and people can potentially enjoy a radical change in lifestyle. These kind of "little actions" sensitize people on the influence of their efforts and how it translates into global benefits, encouraging greater participation.

Use of waste on site as a value added material requires social participation of high impact and infrastructure investment that efficiently supports the different activities involved in waste management: separation, collection and disposal.

Technology and social participation in waste

The first example of this initiative in Mexico is the waste-to-energy project that SUEMA is implementing at the Centro de Acopio Nopal-Verdura (Distribution Centre for edible tender cactus).

This market is the most important distributor of tender cactus nationwide, which is a basic food in Mexican nutrition. It is located in the southwest area of Mexico City, which is a region considered poor.

As part of an awareness strategy a communication campaign has been developed, including both face-to-face and massive activities. The campaign's main objective is to sensitize people on the importance of participating in waste separation and adoption of technologies on renewable energy in a daily setting.

The construction began in September 2015 with an expected completion date in April 2016. It will process 3 tons of cactus waste per day, which means reducing 113.5 tCO_2e of GHG every year, without considering the fossil fuel that is no longer needed in the collection network. The program started with face-to-face conversations with all the people that give life to the market (tender cactus producers and suppliers, consumers, workers) with uplifting results.

In forthcoming months communication activities will be more forceful, including an urban art contest, which are directed for the appropriation of the technology by the people. This project is the result of SUEMA's engineering work and investment, the support of the Ministry of Science, Technology and Innovation of Mexico City (Secretaría de Ciencia, Tecnología e Innovación del Distrito Federal, SECITI, in Spanish) that funds part of the investment, and the municipality authority of Milpa Alta that embrace the project, and civil society.

The next step is to replicate and scale this concept into other markets and other major waste contributors. These response mechanisms can foster resilience of urban areas, through promoting zoning efficiency, without requiring big extensions of land for constructing landfills; avoiding soil and water contamination due to leachates; reducing GHG emission, Black Carbon, and Short-Lived Climate Pollutants.

Cities have a major commitment to breaking the negative paradigms associated with waste management, transforming them into raw material for productive activities, and giving direct benefits to the population, embellishing public places and reducing environmental impact.

SUEMA is socially engaged in promoting the efficient use of resource. Our initiatives are driven to help government and companies improve their services and equipment for decoupling (fossil fuel efficiency) and decarbonizing (fossil fuel trade-off) their growth towards a sustainable development.

www.suema.com.mx

SUEMA®
SUSTENTABILIDAD EN ENERGÍA Y MEDIO AMBIENTE S.A. DE C.V.

MEXICO'S SOLAR SALT: BLENDING DEVELOPMENT AND CONSERVATION

The Ojo de Liebre coastal lagoon in the El Vizcaino Biosphere Reserve, the central part of the Baja California peninsula, Mexico, gives refuge to a diverse range of wildlife, terrestrial endemic species, gravid whales and calves. And at the same time, it's also the operational centre of the world's largest salt field.

Sea, wind, sun and people, these are the elements that make possible the production of solar salt at Guerrero Negro, Baja California Sur, Mexico.

Situated on 33,000 hectares of the most appropriate land for such an operation, Exportadora de Sal (ESSA) is the world's largest salt field. Very low rainfall combines with plenty of sunshine and wind on an ancient sea floor adjacent to the shores of Ojo de Liebre Lagoon in the Vizcaíno desert, to create the perfect environment for a solar salt field that benefits our planet and our people.

In Guerrero Negro, nature has given a head start in the salt production process: the seawater that flows from the lagoon into the concentration areas is naturally a bit denser than the seawater in the ocean due to the natural cycle of the tide and current flow in the lagoon. As the seawater slowly flows through the system of concentration ponds, it gradually increases its density through sun and wind powered evaporation, until it reaches its sodium chloride saturation point.

Whilst increasing the density of seawater, the concentration ponds provide a protected habitat for fish, crustacean (like shrimps and crabs), and sea grass (like Ruppia y Zostera) that supports thousands of birds, including more than 60 migratory species that every year arrive to the Ojo de Liebre lagoon – Guerrero Negro Salt Field complex on their way to reproductive, feeding or growing grounds.

Exportadora de Sal is one of the main salt producers and suppliers for chlor-alkali industry in the Pacific Rim, and also in the road de-icing, water softening and food industry salt market in North America.

It is located in Guerrero Negro, Baja California Sur, Mexico. It is the world's largest salt field, with an actual yearly shipments of 9.5 million metric tonnes, and a loading berth located at Cedros Island, Baja California, Mexico, that can accommodate ships of up to 180,000 DWT.

The company is a Joint Venture between Mexican government Fideicomiso de Fomento Minero and Mitsubishi Corporation.

Diverse ecosystems

Within 6,000 hectares of the concentration ponds, in addition to the presence of several species of birds, live protozoa, insects, the brine shrimp Artemia and microbial mats. These microbial mats are macroscopic arrangements of abundant species of microorganisms. Microbial components of the mats have an important ecological role, not only as primary producers, nitrogen fixers, but also as sediment stabilisers. They also sequester carbon dioxide, the world's most prolific greenhouse gas.

Recent research has revealed that the microbial mats themselves host greater diversity than any other known environment on Earth and that, according to American space agency (NASA) scientists, the oxygen production of one hectare of these microbial mats, equals the produced by an hectare of a mature forest. That is, microbial mats at ESSA's solar salt production ponds not only sequester CO2, but release oxygen to the atmosphere.

Market share

The company has developed an aggressive investment program focused on solving operation issues and increasing our product quality, whilst reducing costs, in order to consolidate and increase our market share. Because of this, in 2014 we will be achieving our goal and new record production and sales of 9.5 million metric tonnes.

ESSA is one of the main salt producers and suppliers for chlor-alkali industry in the Pacific Rim, and also in the road de-icing, water softening and food industry salt market in North America. This year we achieved the organic certification for our product aaftnd we are about to get the pharmaceutical grade certification. ESSA has also developed an option for the utilization of the main solar salt production process byproduct: bitter brine; in

this way, we advance in the pursue of a "zero waste" production process.

Green growth

60 years of uninterrupted operation has proven that economic development is feasible without damaging the environment. ESSA's operation takes place within Mexico's largest natural protected area, the "El Vizcaino" biosphere reserve, and world heritage site "Whale Sanctuary of El Vizcaino". ESSA has proven to be a strong partner on environmental conservation, working with authorities and NGOs, supporting grey whale, sea turtles, pronghorn antelopes, golden eagles, white sharks, birds and many others conservation projects.

ESSA is looking to the future, working everyday for a better world to leave for future generations. Our salt deliveries are made by maritime transportation, to reduce the carbon footprint of salt deliveries over land. In order to reduce our carbon footprint, we had implemented a project to increase quality and production capacity through a low combustible consumption optimization process.

Through an oxygen generator-CO2 sequestering process, low consumption of fossil combustibles and efficient logistics, ESSA not only hits its environmental targets, but works towards a better and clean environment, proving once again the viability of technology and nature working together for a better world.

Exportadora de Sal… 60 years operating with respect and in harmony with nature, for generations to come.

www.essa.com.mx

EXPORTADORA DE SAL

THINK SPACE: THINK SUSTAINABLE DESIGN AND ARCHITECTURE

By Juan Carlos Baumgartner

The issue of how to convert human groups in sustainable societies has ceased to be a romantic notion. Today it is a requirement for anyone who aspires to have a viable future.

In virtually all man's activities, the issue of sustainability is changing the vision of how we do what we do. Architecture is no exception.

Today, buildings are responsible for 12% of the use of all the water on the planet, for 39% of CO2 emissions into the atmosphere, for 65% of the waste generated in the world and for 70% of electricity consumption. Despite these alarming figures, those who lecture, build and market architecture have done little to correct and stop the damage that the built spaces do to the planet.

Since its inception, this firm has been committed to the environment and to sustainable architecture. It has carried out sustainable projects with LEED Certification (Leadership in Energy and Environmental Design), an international certification responsible for the validation and endorsement of architecture projects that comply with higher standards and sustainable practices, both in the United States and in Mexico.

To demonstrate we could achieve this, we set ourselves a challenge. It was not an easy one.

The intention was to generate a project with certification to demonstrate the viability of its use in Mexico's market with not necessarily higher cost or more time to carry out.

Green aesthetic

The conceptual approach of the project Grupo CP headquarters was simple and complex at the same time. It was not possible for us to

apply the rules, both esthetic and functional, to which we are used. It was time to rethink new rules and seek a new esthetic, that is to say, a green aesthetic.

From the beginning, a leading idea showed us the correct way: based on the three "Rs" underlying any green architecture: Reducing, Recycling, Reutilizing. Our organization fosters communication, teamwork and it is a place that reflects the passion and love for architectural endeavor.

Thanks to architectural partition and to lighting design, lighting electric consumption was reduced by 30%. Also, 76% of the materials used in the work of this project were of reutilization.

Both the workstations and the chairs are 'cradle to cradle' certified. Such certification is given to products that use healthy and safe materials, which can be easily reused, which are manufactured by companies that use renewable energy, which maximize the use of water and which have social strategies.

The materials used in the projects have low or zero VOC emissions (Volatile Organic Compounds), in addition to the fact that many of them are recycled and quickly renewable as well. The sealers, paints and adhesives are water-based and VOC free, what ensures the interior air quality. Carpets used are CRI Green Label Plus certified, a certification granted to products that exceed standards of low VOC emissions, both in adhesives and in carpet below and carpet. Each employee has natural light and outside views.

Proud legacy

The resulting space is an excellent example which aligns architecture, technology and human resource in an area that respects the environment and seeks to improve the performance of the organizations. The benefits are innumerable. But the greatest benefit is ours, for our descendants, for our world.

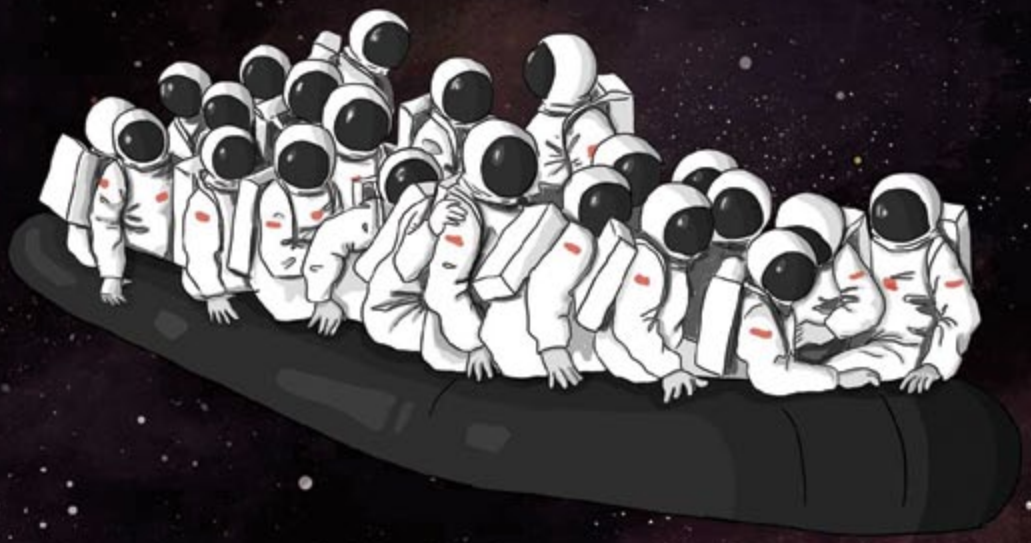
The spaces has categorically helped to transform the way of organization, it contributes to a more dynamic communication fostering the company's culture, and has at the same time become an icon of corporate design in Mexico.

Once again, this organization sets the guidelines in design and architecture, demonstrating their commitment through example and is committed to its environment.

www.spacemex.com

The Last Word:
Actions for Climate Justice
12/12/15

We are the ones
we have been waiting for



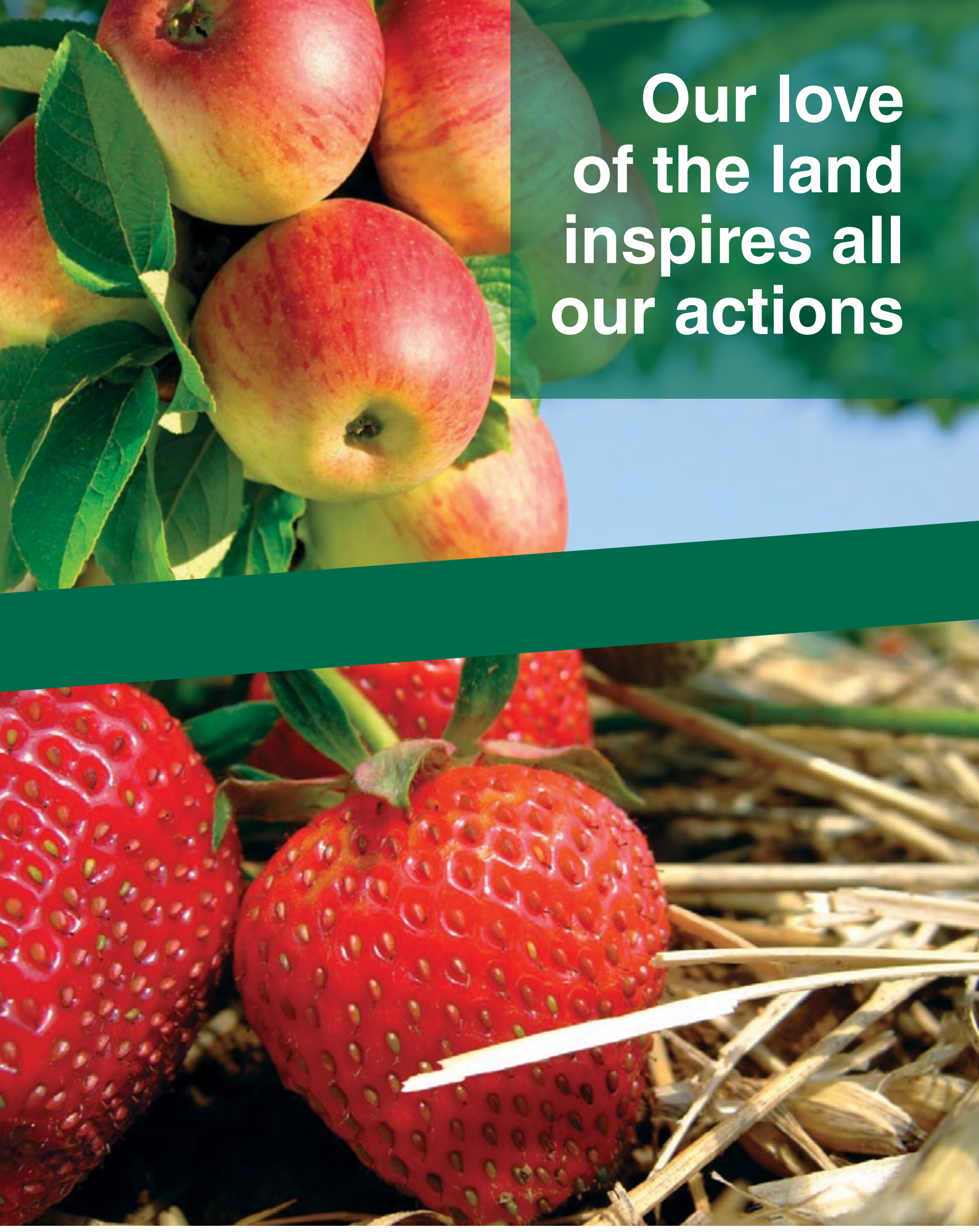
If governments won't stand up for us, we will stand for ourselves.

Mass Action for Climate Justice
12/12/15
350.org/d12

We want to have the last word as the climate talks conclude. And we'll get it by speaking in the language of movements: by putting tens of thousands of people into the streets of Paris, and making sure business as usual cannot proceed as long as world governments fail to do what's needed.

This will be a day of mass mobilization and actions in the streets. We will take the streets of Paris with our determination, our diversity and our creativity: to resist and to build. Our movement is here to last, and it will be shaped by everyone of us. Everything we do, we will do together.

The Paris moment will be defined not by what happens in the negotiating halls, but in the streets of Paris and around the world. Politicians aren't the only ones with power. If enough people agree that it's time for the world to move in a new direction, and push together, the world will begin to move.



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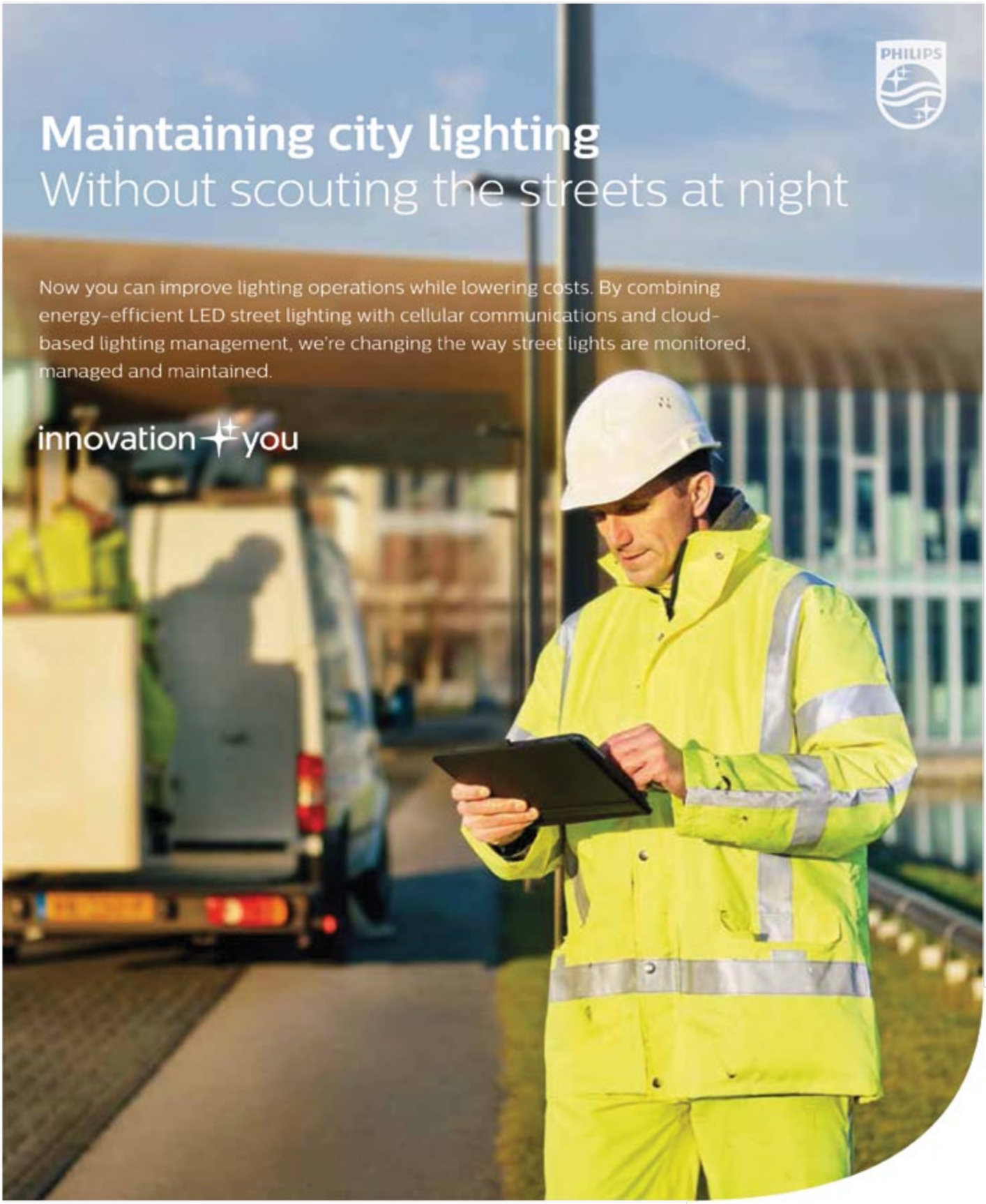

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