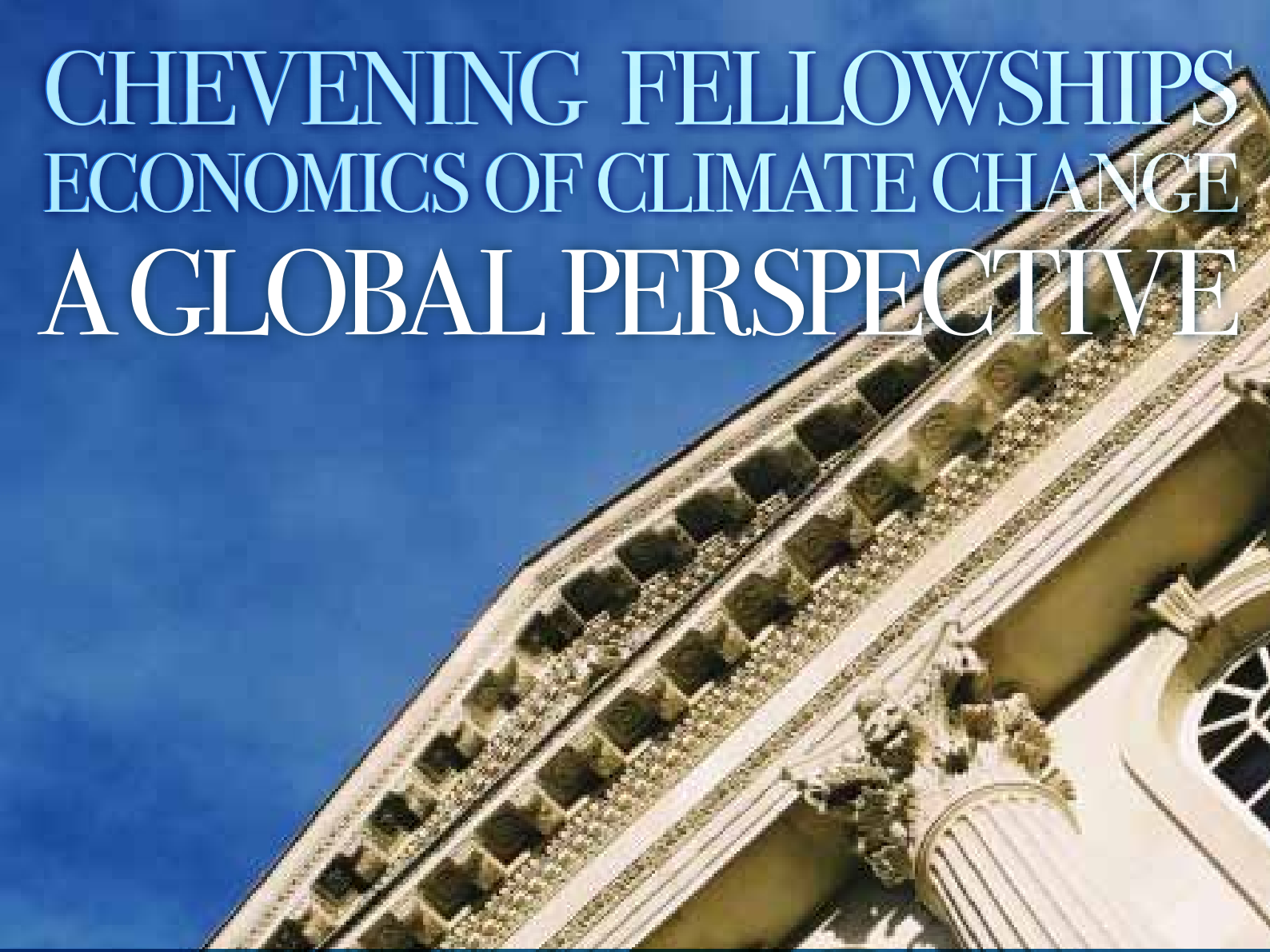
CHEVENING FELLOWSHIPS
ECONOMICS OF CLIMATE CHANGE
A GLOBAL PERSPECTIVE



UNIVERSITY OF CAMBRIDGE
PROGRAMME FOR SUSTAINABILITY LEADERSHIP

Foreign & Commonwealth Office

Index

Introduction to Chevening Fellowships

The Chevening programme is the British Government's flagship scholarship and fellowship scheme. Its overall purpose is to build a long-term network of future friends of the UK in senior positions who will help to support delivery of the FCO's (Foreign and Commonwealth Office's) Strategic Framework. The programme consists of the Chevening Scholarship scheme and the Chevening Fellowship scheme. Fellowships are awards for study on 12-week courses that focus on particular issues aligned to the FCO's Strategic Framework. The courses are bespoke, and are delivered by prestigious universities in the UK on behalf of the FCO. Fellowships are offered to mid-career professionals from around the world and who are in positions of leadership and influence and are active in the field of the Fellowship. At the end of each course, Fellows return home and our network of diplomatic missions maintain contact with them to encourage international policy debates on the various Fellowship subjects. The network of Chevening alumni is now over 34,000 strong and includes current or former prime ministers, presidents, captains of industry and other senior and prominent figures.

The Economics of Climate Change Chevening Fellowship course has been run by the University of Cambridge Programme for Sustainability Leadership for three years. I would like to congratulate the Fellows who attended previous courses and the University of Cambridge for putting together this collection of thought-provoking essays. The essays are a mix of detailed research pieces outlining specific recommendations for policy change in Fellows' home countries, and thought pieces on what climate and economics means for their particular regions.

Mike Stead
Chevening Fellowship Adviser, Public Diplomacy and Strategic Campaigns Team, FCO

Foreword by the Course Director

Introduction

The University of Cambridge Programme for Sustainability Leadership (CPSL) has been very pleased to work with the UK Foreign and Commonwealth Office and the British Council to deliver the Chevening Fellowships Programme on the Economics of Climate Change over the last three years. Over these years we have welcomed 36 Chevening Fellows from China, India, Vietnam, Taiwan, Indonesia, Singapore, United States of America, Canada, Australia, Brazil, Peru, Mexico, Guyana, Barbados, Romania, Russia, Egypt, Kenya and South Africa to Cambridge for three months at a time.

This publication brings together fifteen essays from some of the Fellows. For this publication, Fellows were asked to reflect on climate change and what impacts it would have on their 'world'. There are a number of different styles used – from thought pieces to academic research papers – and we have kept this variety to allow the reader to see the different approaches to the issue of climate change, not only from different regions but also different sectors (academia, business, media and government). The essays have been edited by Emma Williams but we hope not to have altered the conclusions and contents in this process. The Fellows were asked to reflect on their own position in this debate and therefore the essays do not necessarily represent the positions of the Fellows' organisations or governments.

We have not been able to reach out to all of our previous Fellows on this occasion and we can only apologise for the omission of some countries and views here – we would welcome their contributions for a future publication!

I would like to take this opportunity to thank all of the Fellows who have taken part in the Economics of Climate Change programme to-date and I look forward to future years. These programmes offer a fantastic opportunity for us to focus on the key issues around climate change and hopefully come to some conclusions as to how each of us can play our small part in developing climate solutions. I can only say sorry for bringing you to such a beautiful city during some of the worst weather we have had in years (it is not often we get snowed in and are unable to travel anywhere!).

Climate politics

Climate change as a political issue has changed dramatically over the period we have been running this programme. A sense of urgency was building throughout this period. The current phase of the Kyoto Protocol, which sets in place the emissions reduction targets for developed countries, expires in 2012. There is an urgent need to have a new international climate change agreement in place well before then.

At the start of 2008 we had just had the United Nations Framework Convention on Climate Change (UNFCCC) conference in Bali, Indonesia. This had been an excellent meeting for galvanising a political process which aimed to deliver a legally binding agreement at the end of 2009 in Copenhagen.

At the start of 2009, a new President of the United States had just been elected – one who had promised a very different approach to climate change than his predecessor – and the momentum was building.

At the start of 2010 the UNFCCC conference in Copenhagen, Denmark had just ended with no legally binding agreement (and little prospect of one), an increase in climate scepticism and an ongoing global recession.

These different backdrops led to very different emphases during the three years of the programme and it has been interesting to see how the discussion around climate change, and in particular international perceptions, has developed. It is very clear that the conversation today is much more difficult than it has ever

been. The reason for this is that we are now debating the way we are going to tackle the issue, rather than debating whether or not it is an issue that needs to be addressed at all.

Our programme tries to help Fellows develop a sense of the scale of the challenge we face and also understand how this fits into the wider economy and solutions around sustainability. For example, during their time with us, the Fellows are asked to define the goal of a good economy. The definitions developed include food and water security, welfare, education, conflict prevention, sustainable consumption, innovation, aspiration, freedom of ideas, free trade and technology development. However, the simplest definition was:

"The goal of a good economy is to meet people's needs within ecological limits with equitable distribution."

When we examine what the failures of the current economy are, very often we come up

Failures in our current economy

Scale
- only now is there a consensus and concern of scale
- perception of limitless resources
- history and 'business as usual' momentum

Measurement
- environment not valued/priced

Human nature/sociological/ philosophical deficiencies
- greed, immediate needs
- short termism
- fear, lack of tolerance
- omniscience
- knowledge and education
- false hope of technological solution
- media – no longer independent 'public voice'

Governance
- insufficient incentives and punishments
- structural deficiencies (nation states/ superior to nature)
- globalisation
- culture, lifestyle and aspirations
- imbalance/no global governance
- market as a driver
- election cycle
- vested interests
- tragedy of commons
- flexibility of exploitation
- public sphere dominated by corporates
- lack of regulations (national)
- lack of democracy/good democratic process for the individual voice
- 'Western style' democracy
- current international institutions
- great tolerance for inequity

with long lists of key issues that need to be tackled. Some of the key issues that have been identified during the programme are shown on the table on the previous page.

Many of these issues are fundamental to the way we have designed and constructed the current economy. While the economic growth over the past century has led to significant gains in tackling poverty, we still have a world which is more unequal than it has ever been and the tolerance for this inequity does not seem to be reducing.

Often we may wish to deconstruct the global economy and start again. However, it is interesting that human nature has been identified as a key issue – if we *were* to start again wouldn't we just end up in the same position, given that it is *we* who would be doing the redesign?

So the important issue is, given that we are starting from this position, what should be the next step to achieving a global solution that works for individual nations, however they are governed, and builds a long-term process of change that allows individuals and governments to each play their role in achieving this change?

There does seem to be an increased recognition of the scale of the challenge we face, and while Copenhagen did not lead to a legally binding framework as many had hoped, it did demonstrate continued momentum and a willingness by individual nations to develop long-term plans to dramatically reduce carbon emissions.

The governance around climate solutions is in urgent need of review. It is clear that the political process finds it difficult to tackle these long-term, global issues. While we hope we have enough time for the political wheels to turn and reach agreement, this is looking increasingly doubtful. Therefore, as happened after the Second World War, there may be a need for a fundamental review of global governance and to de-couple the climate challenge from short-term politics. This global challenge goes to the heart of the role, and power, of international institutions such as the United Nations, the Multilateral Development Banks and the World Trade Organization.

Measuring carbon is actually the easiest part of this. Putting a price on carbon is essential but not sufficient to tackling climate change. Whether this price is established through emissions trading schemes or a carbon tax will not really matter in the long term if the price is high enough over time to drive real change.

Changing human nature is a much more difficult challenge (and any real solution to climate change requires significant behaviour

change from individuals). The role of education and knowledge (as well as occasionally mandating certain changes in behaviour!) cannot be underestimated.

It is important to tackle the issue of climate change using a systems approach, and to explore the links between it and other key issues, so as not to drive unintended changes in behaviour. So, for example, the link between climate solutions and health (through better lifestyle choices, nutrition and mobility) needs to be integrated into any response to this challenge. We need a new vision, a new aspiration for change that people really want to achieve and that is sustainable.

A fundamental question to ask is whether it is enough to solve the 'carbon challenge', or whether – to truly solve the 'climate challenge' we need a much more holistic approach to a global solution that not only encompasses a low carbon economy but also an equitable economy, with low-climate-risk development and solutions.

Dr Aled Jones
Deputy Director, University of Cambridge Programme for Sustainability Leadership

Director, Chevening Fellowships Programme on the Economics of Climate Change

AFRICA

Climate Change in Africa: Post COP15 Reflections

Stephen N. Mutimba, Kenya

Introduction

One of the most critical challenges facing our global community today is to reach a **fair**, **ambitious**, and **equitable** agreement on climate that can set the world towards a path to avoid dangerous climate change – by putting in place mitigation targets to reverse the atmospheric accumulation of greenhouse gases (GHGs), and adaptation measures that can help us cope with those climate change impacts that cannot be avoided. Yet the progress towards such an agreement, going by what happened in Copenhagen, Denmark in December 2009, has been less than encouraging. Below is a short review of the Copenhagen outcome – the Copenhagen Accord – and what it means for Africa.

The Copenhagen Accord: what does it mean for Africa?

Is the Copenhagen Accord "a disaster"[1] or "an unprecedented breakthrough"[2] in the path towards reaching a new climate change agreement? The answer to that question depends on whom you ask. But whichever way you look at it, one can say with some degree of confidence that this Accord will form the basis of future climate change talks, starting with a series of meetings preceding the May/June 2010 Bonn meeting and others to follow it, in the run-up to COP16 in Mexico which is scheduled for December 2010.

Why? Is it because the Accord heralds in new leaders in climate change negotiations in the name of the USA and China? According to the *Washington Post*, we are entering into a "new world order in which international diplomacy including negotiations in United Nations gatherings (e.g. the UNFCCC COPs) will increasingly be shaped by cooperation between the USA and emerging powers, most notably China",[3] if only to protect their economic interests. This is the bitter truth that those opposed to the Copenhagen Accord just have to swallow. The European Union, which until recently was a 'heavyweight' in these negotiations, is already becoming resigned to the fact that the Copenhagen Accord is here to stay.[4]

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[1] Swedish EU presidency's comments on the Copenhagen Accord: http://www.stuff.co.nz/world/europe/3189867/Copenhagen-accord-a-disaster-Sweden

[2] President Obama's comments on the Copenhagen Accord: http://www.whitehouse.gov/blog/2009/12/18/a-meaningful-and-unprecedented-breakthrough-here-copenhagen

[3] See http://www.washingtonpost.com/wp-dyn/content/article/2009/12/19/AR2009121900687.html

[4] Danish Climate Minister Connie Hedegaard: "What we need to do is to secure the step that we took and turn it into a result." See http://www.reuters.com/article/idUSTRE5BL21F20091222

Many internationally renowned climate policy modellers are also of the opinion that the Kyoto Protocol – with its 'targets and timetables' approach to climate change policy – is not an effective tool for addressing the potential threat of climate change,[5] and maybe it is time for a new approach – the 'unilateral pledges' approach as proposed by the Copenhagen Accord. This model is similar to the 'bottom-up pledge-and-review' model proposed by the Japanese government in 1996 in the build-up to the 1997 COP3 at which the Kyoto Protocol was agreed.[6]

What is it that the Accord contains that should be of interest to African countries?

One of the main positive attributes of the Accord, and perhaps the most important, is that it is driven by – and therefore includes – the two largest climate polluters: China and the USA. These two countries share between them over 40% of the world's total GHG emissions almost on an equal basis,[7] with some reports suggesting that China might in fact have overtaken the USA in terms of absolute emissions.[8]

It is therefore logical to conclude that any mitigation targets that exclude China and the USA will not bring us to less than 2°C warming over and above pre-industrial times, which is what scientists say is the safe upper limit.[9] 'Failure' of the Kyoto Protocol to result in actual emissions reductions may in fact, be attributed to the fact that the Protocol did not oblige China and the USA to reduce their emissions during the first commitment period.[10]

Accordingly, the Accord proposes – as many were expecting before COP15 began – that both developed and developing countries mitigate (through Quantified Economy-wide Emissions Reduction Targets for developed/Annex 1 country Parties and Nationally Appropriate Mitigation Actions or NAMAs for developing/Non-Annex 1 country Parties). And unlike the UNFCCC, it does not make reference to "historical responsibility", but instead refers to "equitable right of access to the atmosphere".

These statements are open to many interpretations. The exclusion of "historical

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[5] Thorning, M. and Illarionov, A., (Eds.), Climate Change Policy and Economic Growth: A Way Forward to Ensure Both, International Council for Capital Formation and the Institute of Economic Analysis, 2005; http://www.iccfglobal.org/research/climate/climate-change-book.html

[6] Egenhofer, C. and Georgiev A., 'The Copenhagen Accord: A first stab at deciphering the implications for the EU', CEPS (Centre for European Policy Studies), December 2009

[7] See Ecofys, 2009 GHG reports http://www.ecofys.com/com/publications/reports_books.asp

[8] See http://www.nytimes.com/2007/06/20/business/worldbusiness/20iht-emit.1.6227564.html for more details

[9] See, for example, Hare, W.L., 'A Safe Landing for the Climate' The WorldWatch Institute, 2009, for other opinions on the 2 degree limit, http://www.ped.muni.cz/wphy/projekty/klima/ASafeLandforSOW09_chap2.pdf

[10] The USA, an Annex 1 country, refused to sign the Kyoto Protocol, while the protocol excludes China (Non-Annex I Party) from taking on any mandatory reduction targets during the first commitment period.

responsibility" can be taken to mean that any future agreement will have to commit, either legally or through some form of national/international obligation, past, current and future emitters to GHG emissions reductions. "Equitable right of access to the atmosphere" asserts this further. While every state has a right to develop, that right must not interfere with others' rights to enjoy the benefits provided by a clean climate.

Many informed opinions would agree that this is probably the best approach to solving the climate crisis: the mitigation burden should not just be left to developed countries (past emitters) alone, but **must** involve both developed and developing countries, while "*bearing in mind that social and economic development and poverty eradication are the first and overriding priorities of developing countries*".[11]

Some specific clauses in the Accord that should be of interest to African countries touch on **Adaptation**, **Finance, Deforestation (REDD)** and **Technology transfer**. These are discussed below:

Adaptation

For many developing countries and emerging economies, climate change is framed in the context of adaptation. Adaptation is of importance to them because:

- many of them are located where extreme weather conditions are already being experienced; and
- they lack the financial, technological and human resource capabilities needed to adapt to these conditions.

The Copenhagen Accord calls for "urgent" action and cooperation on adaptation particularly in the least developed countries, small island states, *and Africa*, with developed countries committing to provide financial resources to meet the costs of adaptation.

Finance

For the first time in the history of the climate change regime, developed countries have committed to a goal of jointly mobilising US$100 billion annually by 2020 from both public and private sources. Not only could this unlock the finance stand-off in the climate change debate, it also gives further impetus for the development of the carbon markets.[12]

Besides these long-term financing commitments, developed countries have also committed to mobilise US$30 billion towards meeting adaptation and mitigation needs in developing countries for the period 2010–12, with adaptation being prioritised for the most vulnerable developing countries.

Deforestation/REDD

There is an explicit acknowledgement to

[11] Paragraph 2 of the Copenhagen Accord http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf

[12] This is a necessary condition if a universally acceptable post-Kyoto agreement is to be realised soon. Carbon markets are an integral component of the European Union's mitigation strategy. Therefore, their exclusion from a negotiation text may derail the process.

act on deforestation and forest degradation and to establish a mechanism (i.e. a body) to mobilise required resources. Most developing countries – including those from Africa – have been pushing for such a mechanism, while arguing, and rightly so, that emissions from deforestation are 'survival emissions' as opposed to 'luxury emissions'. The whole purpose of such a mechanism is to provide incentives to poor and natural resource-dependent people so that they can use their forest resources sustainably.

Technology transfer

A fundamental and genuine concern of developing countries has always been how to grow 'green' as championed by developed countries, yet without the necessary means to do so in terms of clean technology.

The Accord proposes the establishment of a Technology Mechanism to accelerate technology development and transfer in support of action on adaptation and mitigation that will be guided by a country-driven approach and be based on national circumstances and priorities.

Other than in these four specific areas, a positive attribute of COP15 worth mentioning is the level of awareness of climate change issues it helped create among African top leaders, heads of states, Ministers, etc. In general, the interest in climate change before and after COP15 was unprecedented; never before in the history of climate change regime has anything like it been observed. This is a positive move, especially for Africa, because it means that climate change and other major environmental concerns will no longer be pushed to the periphery, but will form key components of central governments' planning.

Vital concerns about the Copenhagen Accord

Despite all these 'positive' things about the Accord, there are vital concerns about it, the main one being that it is currently suspended in 'legal limbo'. Even if legally adopted the Accord's major implications are, to a large extent, linked to the absence of legally binding 'targets' and commitments. The major question is whether these commitments will be fulfilled, now that they are voluntary, especially given the experience with Kyoto.[13] There is however, hope for this prospect, with the US President recently declaring that, "a binding deal is still our goal".[14]

In addition, there are also genuine concerns among some scientists and policymakers that Annex 1 Parties' pledges for 2020, combined

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[13] As of January 18 2010, no significant progress had been made in terms of countries appending their names to either of the Accord's annexes, forcing the UNFCCC chief to send out a reminder. See http://unfccc.int/files/parties_and_observers/notifications/application/pdf/notification_to_parties_20100118.pdf for more details.

[14] See http://www.denmark.dk/en/menu/Climate-Energy/COP15-Copenhagen-2009/Selected-COP15-news/Obama-A-binding-deal-is-still-our-goal.htm

with the implementation of the NAMAs by the emerging economies of China, India, South Africa and others, could bring us to 3.2°C warming at best,[15] well above the safe 2°C limit, and with potential disastrous implications for developing countries (including in Africa) with the least means to cope. These implications or impacts are already evident across Africa.

[15] See Climate Action Tracker at http://www climateactiontracker.org/briefing_paper.pdf


ASIA

Deploying Low Carbon Technology: The Need for a Monitoring Framework

Upik Sitti Aslia Kamil, Republic of Indonesia

Background

This essay is inspired by the new insights gleaned on the Chevening Fellowships Programme on the Economics of Climate Change. Issues of national interest as well as of common interest have to be considered in order to understand the whole concept.

During the Chevening Fellowships Programme, once we started to map the concept of the change to low carbon development, it became clear that there are two important basic issues: human capital resource and technology for mitigation (including low carbon technology and technology for adaptation). This essay will focus on low carbon technology.

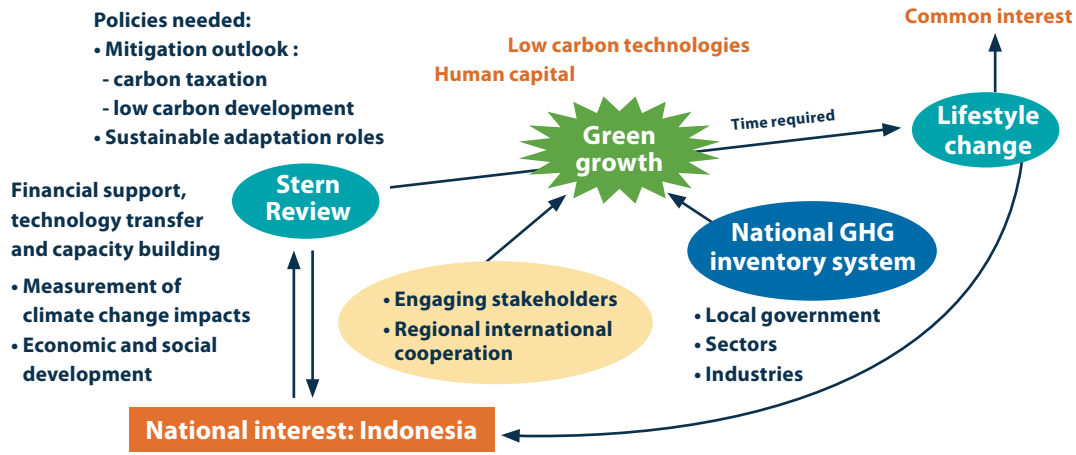
The essay will look at the technology used by industry and the technology used to exploit our natural resources, such as minerals, oil and forests. It will also consider how technology can contribute to our short-term requirements as well as our long-term targets.

The figure on the next page shows that without a technology change we will not be able to make the targets a reality. We need a tool to realise the change: the Stern Review[1] could be used as a basis to review policies and see how they match with the technology required. All policies have to be balanced at the outset and the Stern Review is a tool to make a link between national policy and our common interest in tackling climate change.

In this essay, the intellectual property rights (IPR) and knowledge transfer issues will not be discussed. Whether we like it or not, somehow low carbon technology must be implemented in our country. So how should this new technology be deployed? We need to consider both upgrading our current technology as well as implementing new technologies, and match the technology with long-term development planning. Then we need to assess the readiness of stakeholders; the sustainability of the technology; and the impact on our sustainable development.

[1] Stern, N., *The Economics of Climate Change, The Stern Review*, Cambridge University Press, 2007

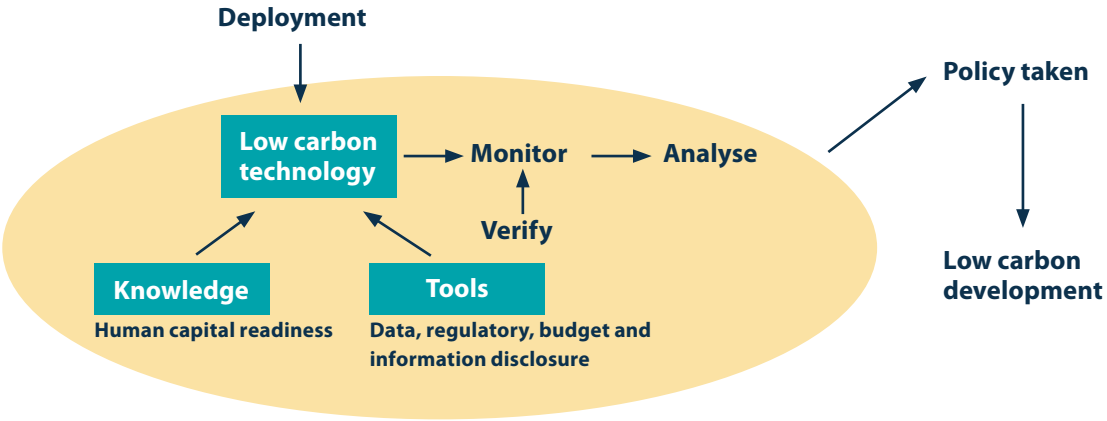
Deploying low carbon technology: the whole concept



The implementation of new technology should have a positive impact not only on our environment – consumption no longer being carbon intensive – but have a positive impact on social and economic aspects. We need to establish an independent institution to consider these aspects; this institution will play a role beyond the deployment of new technology.

The following figure shows us that beyond the deployment of technology, we need to monitor its implementation and verify the results of the monitoring. This essay will focus on the monitoring action required to review the implementation of low carbon technology. The essay will also elaborate on the form of the monitoring institution in order to help find a solution for long-term development planning based on the current conditions in Indonesia.

Monitoring the deployment of low carbon technology



How Indonesia is addressing climate change

Indonesia has started to place climate change as a priority in its five-year planning development. In November 2007, when preparing to host COP13 in Bali, Indonesia published its National Action Plan Addressing Climate Change. This action plan is based on our national development triple-track strategies which are pro-poor, pro-job and pro-growth within the pro-environment principle. This action plan covered not only mitigation but also adaptation actions, as we are now aware of the accumulation of ecological damage over the previous generations.

The Asian Development Bank's *The Economics of Climate Change in Southeast Asia: a Regional Review*, published in 2009, found that heat waves, drought, floods and tropical cyclones have become more intense and frequent in the Southeast Asia region, causing extensive damage to property, assets, and human life. One of the conclusions of this study is that an essential component of an effective global solution is the adequate transfer of financial resources and technology know-how from developed to developing countries.

Driven by the Stern Review, Indonesia has also developed a green paper, the Green Economic Study, which focuses on how a low carbon economy could have a positive impact on the growth of Indonesia's economy and the Indonesian community. This study used the computable general equilibrium (CGE) method and includes some non-market beneficial impacts for forestry sector. Simulations have been used for scenarios such as: a 25% energy efficiency policy; 50% of fuel switching to gas; implementing a carbon tax; and a decrease in the deforestation rate of 10%.[2]

Indonesia has started to launch regulations for building a National Greenhouse Gas Inventory System. Once this has been established, it could help monitor the application of low carbon technology to begin the trajectory towards achieving our emissions reductions target and upgrading our technology needs assessment (TNA) report.

All practices being implemented by institutions and individuals, whether at state or province level, must be well managed. We have some programmes under the Ministry of Environment which could be used to verify the implementation of low carbon technology. The well-known programme (PROPER),[3] which gives ratings for industrial performance, could help in showing which compliant industry could be selected as a benchmark. The Clean Development Mechanism (CDM) project could also contribute in searching for a benchmark based on the experiences in evaluating technology transfer criteria under the CDM project.

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[2] 'National Action Plan Addressing Climate Change', Indonesia State Ministry of Environment, November 2009

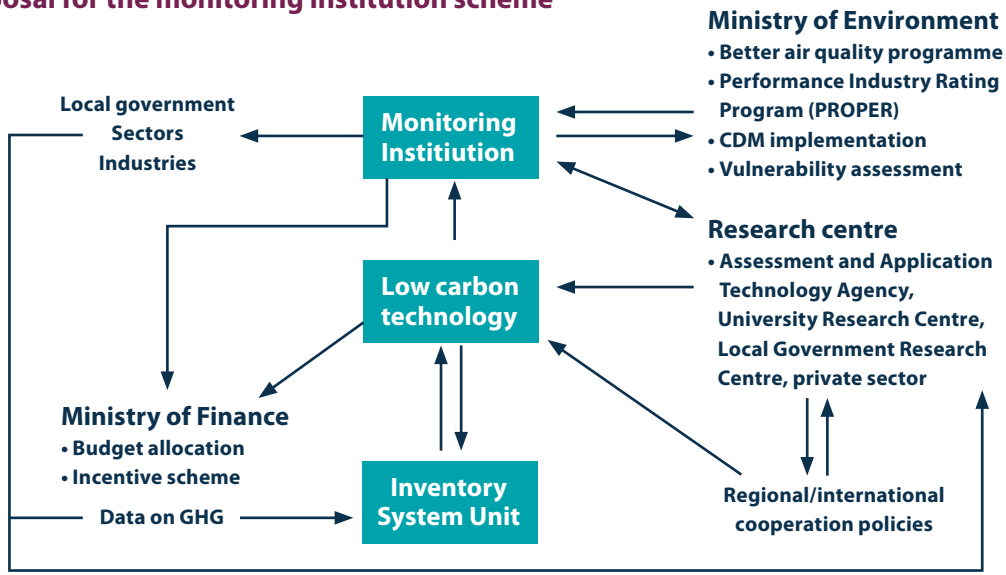
[3] Indonesia's Performance Rating Program for Industry (PROPER) has five ratings: Gold, Green, Blue, Red and Black, depending on industries' compliance in managing waste, creating energy efficiency and developing corporate responsibility.

Establishing a monitoring institution

A monitoring institution should be built to assure Government and stakeholders that the right technology is being used, while also completing a cost–benefit analysis. As there is still no standard for low carbon technology, the institution could start by setting a benchmark. It could analyse the feasibility of a particular technology based on a sectoral approach unless implementing the new technology will create a new problem e.g. a market monopoly. The institution must address the problem of data requirements in determining baseline scenarios.

It is clear that one of the objectives of developing this institution is to ensure that there is a transfer of know-how and technology, to help Indonesia achieve its emissions reductions targets of 26% by 2020 (by unilateral action) and 41% by 2020 (by supported action), and also to help in improving the National Technology Needs Assessment (TNA) report. To support the effective work of the monitoring Institution, a research centre needs to be established.

Proposal for the monitoring institution scheme



The figure above shows that to establish the institution, we need the involvement of stakeholders. First, we need to develop a research centre, or alternatively strengthen an existing research centre. Within the research centre, we need a strong commitment from the Assessment and Application Technology Agency, University Research Centre, Local Government Research Centre and private sectors to work together. The research centre will play an important role in gathering and compiling all the information about low carbon technology in engineering and energy-intensive industries.

In cooperation with the research centre, the institution could help to set baseline data and to analyse the monitoring results. By analysing the results, it would help in mapping the needs of technology on the subject of development planning and stakeholder capability. The result will be a tool to support policies from the Ministry of Finance to aid green economic development. The recommendations of the institution will also give feedback for existing programmes. The greenhouse gas inventory system is required to give accurate data to the monitoring institution. The Ministry of Environment could help the institution by providing existing programmes that could begin to discover the level of company awareness.

Finally, it should be borne in mind that building a new institution will require additional national budget for operational procedures. However, this institution and the research centre could also find their own financial resources.

Function of the monitoring institution

The function of the monitoring institution would be to coordinate other related institutions from government and the private sector to act in a concerted way. Acting as coordinator, the monitoring institution will not be involved in sector policies but will only provide data, information and observe outcomes. The output from the monitoring institution will be used as an input for all stakeholders' sectors, local government, industries and the private sector. For example, the input for the Ministry of Finance will give the Ministry insight when it is creating a new mechanism for providing financial resources and incentive schemes to drive stakeholder implementation of low carbon technology.

As a monitoring body, this institution needs to provide a system of doing the monitoring: this could be survey-based and combined with regular field visits. Criteria also need to be set up to evaluate the sustainability of the technology.

The monitoring institution, together with the research centre, would act as a verification body to analyse the impact of implementing low carbon technology. The verification would not only be for the engineering, energy used and physical performance but also for the cost-effectiveness of the low carbon technology.

Finding an industry 'champion'

With reference to the previous comments about finding the benchmark using existing programmes, this could be done by selecting industries from PROPER and CDM participants. Some industries with Green and Gold PROPER ratings have begun to create energy efficiency and corporate social responsibility (CSR) programmes. The next stage is to prioritise industries based on the intensity of energy consumption. Finally, hopefully an industry champion could be found.

The challenges facing Indonesia, based on the lessons learned by the UK

The challenges we face are rooted in the problem that our common future is not being supported by the current process of development. The case for long-term planning for climate change has been made strongly,

but its implementation will be reliant on the existing policy makers. How seriously the Government takes low carbon development, and the human resources budget given for the institution, will determine its success.

Many cities in Indonesia have expanded without regard to the sustainability of local hydrology – such as unplanned developments that could divert the green zone of the water catchment area, causing erosion. Industry has exploited water, non-renewable energy and forest resources without planning to protect them by less intensive consumption.

Using the lessons learned by the UK, constraints (from the perspective of the stakeholders) will include the differences in stakeholders' baselines, target setting and capabilities. These may mean that there is difficulty in finding a champion to set the benchmark for the implementation of low carbon technology.

The UK's experience is that implementing command-and-control mechanisms have not really worked, because of the differences in levels of concern. The amounts required to invest can also be a problem for a stakeholder: for a company, this might affect the supply chain and revenue return. For Indonesia's local government, it might conflict with current policy that seeks short-term goals in managing land use, land-use change and forestry (LULUCF), the energy used and even waste management. Some local government officials will think they know already their area and how to manage it. However, if we want to link development to the issue of climate change we need to ensure a good level of local government understanding. For local government, command-and-control mechanisms will not work; the local government policy makers should have the ability to control industry behaviour in their own districts.

The UK's example has also shown that the sustainability of the technology will be based on market take-up. If the technology is used everywhere it means the cost will be lower.

Market take-up will also be affected by the competitiveness of the end product. Standards being put in place by developed countries through the World Trading Organization (WTO) may be also problem for exports.

Summary

In this section, the author will try to answer the questions raised previously. Of course, the implementation of solutions is difficult and takes time but it could be begun by finding the way to convince high-level policymakers.

We need to plan for long-term development by analysing the results of monitoring over time. This trajectory will match the capability of stakeholders with the implementation of low carbon technology.

Besides the requirement of establishing new institutions to support this concept, it is also important to identify key policies and allocate a special budget for the monitoring actions of the institution and research centre. Without this, there will be uncertainty whether the institution can continue.

Information disclosure such as sharing data and information about new low carbon technologies is needed: all stakeholders should give transparent information to the institution.

The monitoring institution will also need existing policies and programmes to start its work. Assistance with survey schemes will help to collect data for doing the monitoring. For verification, the ISO scheme could be used as a tool. We need to build capacity, not only for improving the institution's capability, but also for improving stakeholder understanding and capability. The institution, in cooperation with the research centre, should develop a programme to improve the skills of Indonesia's labour force and exchange knowledge and expertise beyond IPR restrictions. To support this idea, regional and international cooperation is needed (such as joint research projects), both North–South and South–South.

The institution needs to have support for its role. In terms of moving stakeholders towards implementing low carbon technology, we could try a voluntary approach. Gathering data on and taking into account the views of all stakeholders would play a significant role in helping policy makers prioritise for the long-term and to put the right resources in the right position. Thus, we need trust between policy makers and stakeholders to encourage full disclosure, and the monitoring institution needs to provide a good service.

Lastly, we need an industry champion, and the idea of using existing programmes and policies to find one has been suggested above. To achieve success, we need to strengthen the will and capacities of all stakeholders: at individual, business group, local government and state government level. Hopefully in this way problems with IPR issues could be circumvented.

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Responding to Change: Searching for a Path through the Climate Haze

Samir Saran, India

For an emerging economy like India, the response to climate change will be shaped by a number of dynamic factors, complementary and competing at different junctures. The contours of this response will be determined by geopolitical power-play; economic growth; consumer behaviour; poverty and social justice; the influence of incumbent and new businesses; governance and political leadership at the centre and the provinces – and most importantly the ability to attract and generate finances.

This paper discusses the influence and interactions of these factors at three distinct levels. First it discusses the global (dis)agreements on climate and some of the boundaries of policymaking. Then the paper discusses the Indian domestic imperatives that are decisively influencing its carbon choices. Finally, it shows that – with the growth in the aspirations and affluence of the Indian middle class – the 'consumption economy' will increasingly influence India's carbon profile.

International climate ideologies

The global debate around climate change is substantially larger than its environmental significance, and has become the most important narrative of the 21st century. It influences geopolitics, global trade and economics, and will increasingly define the way we live, interact and coexist as individuals and communities. Our media-rich world has ensured that climate change has entered the mainstream discourse (and rightly so!); and citizens and communities view and respond to it as both a threat and an opportunity. Sharp divisions amongst countries and communities in identifying with and understanding climate change not only negate the growing scientific consensus on the real dangers caused by unsustainable CO_2 emissions, but mean that different countries and communities seek to engage with it discreetly, and in a partisan manner.

Over the last decade, many of the narratives that comprise the climate debate have become increasingly rhetorical and are now more about contest than consensus. The sheer diversity of our inherited cultures, development trajectories and history, alongside (paradoxically) our converging aspirations, have led to sharp differences.

These weaken *internationalism* on this vital debate; rather, nationalist and sub-nationalist imperatives increasingly define the (dis)agreements on the subject.

Climate narratives are fast shaping sociopolitical and economic beliefs, resulting in climate ideologies spread across networks and groups, countries and regions – not too dissimilar to religion itself. Like most religions, these frameworks have their share of rigidities; with each having discovered the 'chosen path' that offers a righteous response to the challenge. Interestingly, a ruling by a UK court in November 2009 observed that an individual's views on climate change had the same weight in law as his religious and philosophical beliefs;[1] a legal sanction to the religionisation of the debate. The full implications of this may only be felt when climate action moves from industries and businesses into our homes and impacts individual lifestyles.

This, in essence, is why we as a global community cannot agree on climate change – its cause or our response to it. Each of us individually and collectively is a prisoner of our own belief system and our own individual interaction with it. And, like any belief system or religion, the debate on climate change has acquired its fair share of myths and imagined realities. These diverse myths and realities form the basis of the disagreements on climate change that are prevalent today amongst the 'diversely developed'.[2] Therefore, the challenge for global policymakers involved in climate negotiations is to develop a common understanding which would form the basis of a common response to climate change; akin to discovering a common religion for humanity.

How are discussions on climate different from, say, the negotiations at the World Trade Organization (WTO) or the World Intellectual Property Organization (WIPO)? Each of these also arouses passions, has significant geo-economic and political significance, and generates widespread public interest. The difference, other than the sheer scale and scope of the climate landscape, is the interjection of 'morality' and 'ethics' by all parties into their climate propositions. Each party to the debate genuinely believes it has the moral argument and hence the right to prevail. Like ideologies and religion, the parties to this debate are not constrained within national boundaries. People with similar beliefs are linking up across geographies,[3] leading to increasing divergence of opinion on the subject within the same political unit, province or nation; a new complexity that governments must respond to as they develop national policies and responses.

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[1] Adams, S., and Gray, L. 'Climate change belief given same legal status as religion', *The Telegraph*, November 3, 2009; http://www.telegraph.co.uk/earth/earthnews/6494213/Climate-change-belief-given-same-legal-status-as-religion.html

[2] Powell, L., 'Climate and the Clash Between the Diversely Developed', *ORF (Observer Research Foundation) Energy News Monitor*, Volume 6, Issue 28, December 23–9, 2009

[3] See, for example, 'Sounding the trumpet: A link-up between faith and greenery brings unlikely people together', *The Economist*, November 5, 2009

So what are these climate ideologies, and what are the imagined realities that have shaped the contemporary debate? The imagery of "polar bears floating on ice floes"[4] is perhaps the most representative visual description (alongside those of melting glaciers) of the dominant discourse on climate in the western hemisphere. This image was a catalyst in encouraging global action and attention in the early days, and over the years has become the basis of a certain imagination of climate.

[4] Quote from Mukul Sanwal, former Coordinator, UNFCCC and former Joint Secretary, Ministry of Environment & Forests. For more information see 'Myths and Realities in Climate Change negotiations', ORF, September 10, 2009; http://orfonline.org/cms/sites/orfonline/modules/report/ReportDetail.html?cmaid=17019&mmacmaid=17020

This image captures the western imagination, and in responding to its message, the western audience may conjure up images of factories in China belching CO_2. Across the economic strata – business leaders, policy makers or the common man – the climate equation can appear simple and resolvable.

Chinese factories are polluting the environment and causing the global warming that threatens the polar bear and life on earth. Policy proposals from this group of climate believers seek ways to reduce and stop emissions from the manufacturing bases in Asia and elsewhere: they believe that the cause and response are located in China, India and other emerging markets.

As a result of the increasing clout of the BRIC countries (Brazil, Russia, India, and China) and the erstwhile 'third world', there is another climate imagination influencing the debate. The imagery and narrative of burning villages and the homeless people in Darfur, Sudan define climate change for some groups, predominantly outside the OECD (Organisation for Economic Co-operation and Development) countries. For these groups, the impact of global warming on local ecosystems, such as the drought in the Sahel region,[5] with the consequent ethnic conflict over water and resources, defines the implication of climate change. And with this visualisation of climate change, the response equation changes dramatically. Here the 'American dream' becomes the villain, with its trappings of fuel-guzzling cars, appliances and air-conditioned houses. The climate equation centres on consumption and lifestyle, with elements of redistributive economics and social justice liberally added in.

There are other equally passionate discourses. One suggests that this entire debate is an effort to dampen the growing power of the global south and the emergence of China and India; explaining that the climate narrative is more about preventing change within the geo-economic and geopolitical landscape, rather than responding to climate change.[6]

Another narrative is that of the victim, with an emphasis on the historical carbon space that the developed world is already occupying, leaving little 'carbon room' for the development imperatives of much of Latin America, Asia and Africa. This narrative is perhaps the most compelling as it is supported by facts that cannot be argued with but it is limited by circularity as in a sense that space cannot be released and hence the response to this inequity will necessarily involve elements other than the carbon space itself which leads us to a bouquet of other debates.

While there are many such narratives, the common threads across each are compelling moral and ethical arguments and justifiable demands for action or inaction that are

[5] Ban Ki-moon, 'A Climate Culprit in Darfur', *Washington Post*, June 16, 2007

[6] Joshi, S., 'The tale of the sad negotiator' July 27, 2009, ORF; http://orfonline.org/cms/sites/orfonline/modules/analysis/AnalysisDetail.html?cmaid=16611&mmacmaid=16612

difficult to ignore. Another common feature is that most of the narratives seek to conceal that they are also power discourses, and seek to claim or reclaim political and economic significance for the originator.

Irrespective of the origins and motivations of such discussions, central propositions within them all will need to be responded to in order to find solutions. Ignoring the weak and the politically less significant is no longer an option, and the arrogance of the past in defining the development model for the world to embrace may not work going forward (as effectively at the very least).

There are two reasons for this. First, we know that development models and international policy prescriptions do not work out of context and they need to be internalised by the locality; we have seen nations fail and fall, and widespread inequality and poverty resulting from attempts to homogenise the world. Second, we do not have an option. The weak and poor have a compelling argument: their influence on carbon emissions. Their actions (or inactions) will have a bearing on our common future (e.g. carbon emissions and carbon sinks linked to forest- and agriculture-based communities) and must be enthusiastic partners if we are to manage the challenges of climate change and GHG emissions. They cannot be distanced from global development and discarded from our imaginations as the 'third world' any longer; CO_2 is secular and knows no boundaries.

As a result, the contemporary climate narrative also re-emphasises the importance of social sciences alongside politics, science and economics if we are to achieve a lasting global consensus. As Lydia Powell, Senior Fellow at the Observer Research Foundation[7] observes, "Officials, economists (and scientists) have until now colonised the climate discourse and like second generation migrants want to keep out new immigrants from social science(s) who want to introduce political, ethical and moral arguments." While we cannot discount climate,[8] we will increasingly also be unable to discount human life and human conditions.

The Indian position and proposition at international fora was also a combination of many divergent narratives. On one hand, the lure of the high table and global leadership compelled the Indian policymakers to articulate positions not too divergent from the mainstream. On the other hand, they were responding to their domestic public opinion that seeks to place 'historical responsibility' at the heart of any climate response. Not surprisingly, the Indian position appeared muddled and sent mixed signals to the global community. Historically, the Indian position on climate recognises the necessity for immediate action by Annex 1 countries for GHG reduction, and – consistent with the

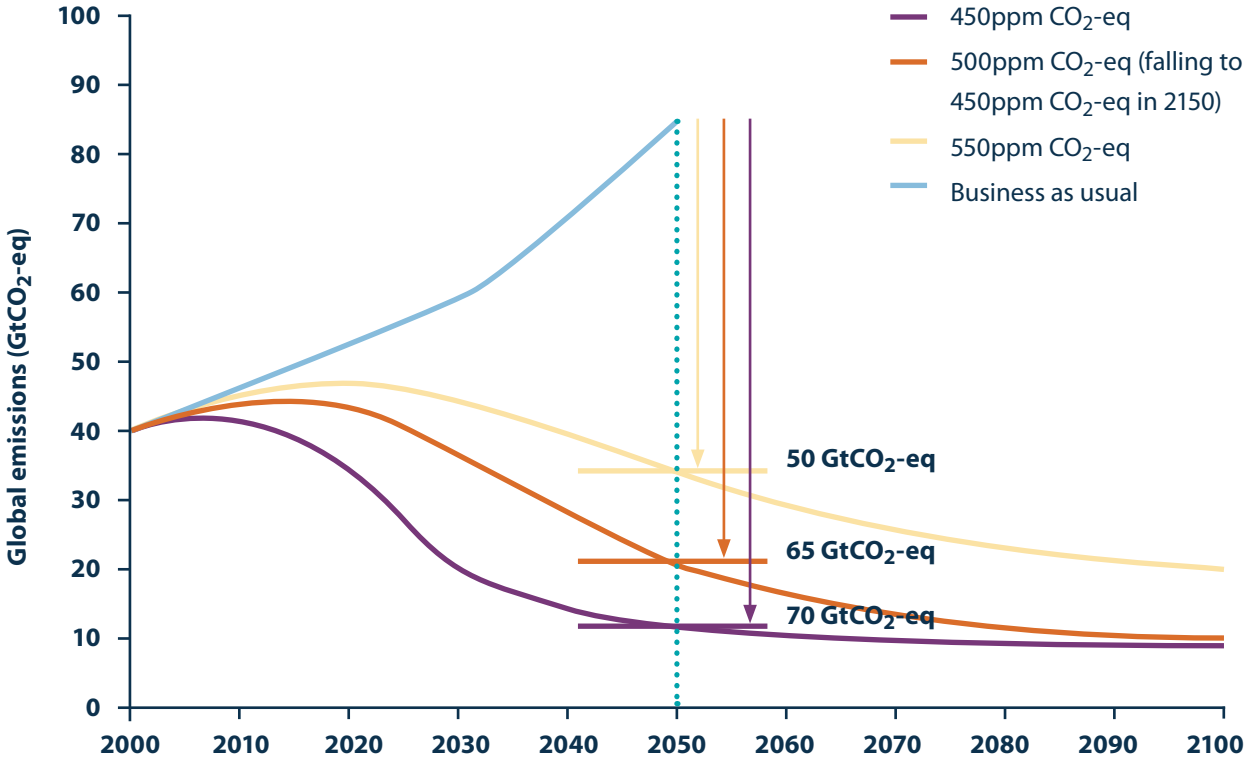
[7] Powell, L., 'Climate and the Clash Between the Diversely Developed' ORF Energy News Monitor, Volume 6, Issue 28, December 23–9, 2009

[8] Stern, N., The Economics of Climate Change, The Stern Review, Cambridge University Press, 2007

Kyoto Protocol and Bali Declaration – expects financial and technological assistance for the developing economies from Annex 1 countries for the transition to a low carbon pathway.

At Copenhagen, India also committed to the common objective of ensuring a global temperature rise of less than or up to 2°C by 2050. This would require restricting CO_2 emissions to 450ppm by that date. The Indian Prime Minister has pledged[9] to restrict the Indian per capita emissions to less than the average of the developed economies, hypothetically meaning that India has also agreed to limit its per capita emissions to about $2tCO_2$ by 2050, should the developed world lead this transition.

Scenarios for reductions in global emissions



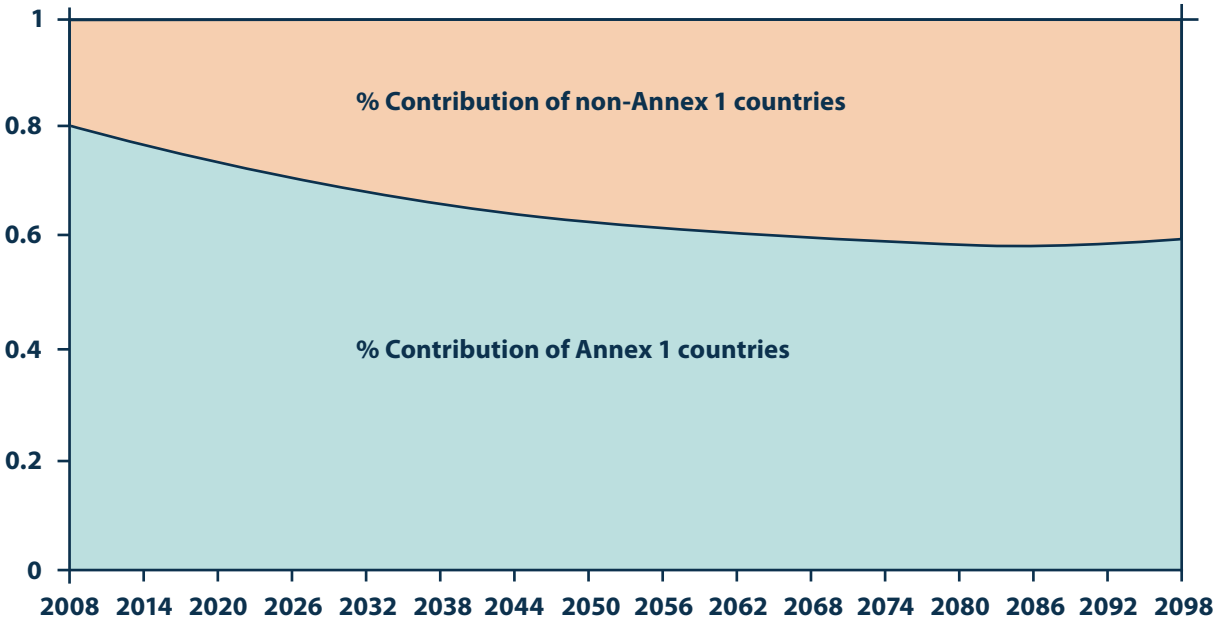
Source: The Economics of Climate Change: The Stern Review[10]

[9] 'PM Unveils Action Plan on Climate Change' *The Financial Express*, New Delhi, June 30, 2008

[10] Stern, N., *The Economics of Climate Change, The Stern Review*, Cambridge University Press, 2007

But this position itself is contradictory. As can be seen in the above graph, a reduction of nearly 70GtCO_2-eq over business-as-usual levels (BAU) must be achieved by 2050. More than 75% of the global growth in CO_2-eq emissions will be in developing countries, with more than 50% in China and India alone. Halving energy-related emissions in OECD countries alone will yield only around 10GtCO_2-eq emissions reductions. The emerging world will have to bear the burden of achieving the stabilisation in emissions. At Copenhagen, India and China (along with Brazil and South Africa) have agreed to bear the climate cross; a development not recognised by the western media discourses.

Occupied carbon space[11]



The current and projected CO_2 signature of the Annex 1 countries in the graph above (between 60–80%) cannot be justified on the basis of their geographical size, population or GDP, and represents an unresolved inequity if CO_2 emissions are to be limited. The western audience is insulated from these developments and is further influenced by discussions that distort the temporal (conflating the past emissions with the future

[11] Facts and figures from Tejal K., et al., 'How Much 'Carbon Space' Do We Have? Physical Constraints on India's Climate Policy and its Implications', *Economic & Political Weekly*, October 10, 2009, Volume XLIV, No. 41; http://www.epw.in/epw/uploads/articles/14044.pdf

CO_2 contributions) and the spatial (conflating the affluent with the aspiring to be affluent) dimensions,[12] thereby placing the onus of response firmly on the emerging world despite the responsibility being to the contrary.

Domestic drivers of Indian emissions

	2005	2010	2020	2030	Annual change
Total OECD	13,565	13,829	14,736	15,538	0.5
Russia	1,696	1,789	1,984	2,117	0.9
China	5,323	6,898	9,475	12,007	3.3
India	1,164	1,349	1,818	2,238	2.6
Brazil	356	451	541	633	2.3
Total non-OECD	14,486	17,271	22,299	26,787	2.5
Total world	28,051	31,100	37,035	42,325	1.7

Source: World Energy Outlook 2009, World Carbon Dioxide Emissions by Region: Reference Case ($MtCO_2$)

India's five climate models

In October 2009, the Government of India published a report[13] on the key findings of five separate climate models that projected India's carbon emissions up to 2032–2033 in 11 different scenarios. Four of the five models concluded that by 2032, India's per capita emissions would still be below $4tCO_2$ per capita compared to the 2005 global average of $4.22tCO_2$ per capita. India's projected absolute emissions will vary between $4.0–7.3BtCO_2$. All studies report continuous and substantial decline in India's energy intensity and CO_2 intensity of GDP. Due to the

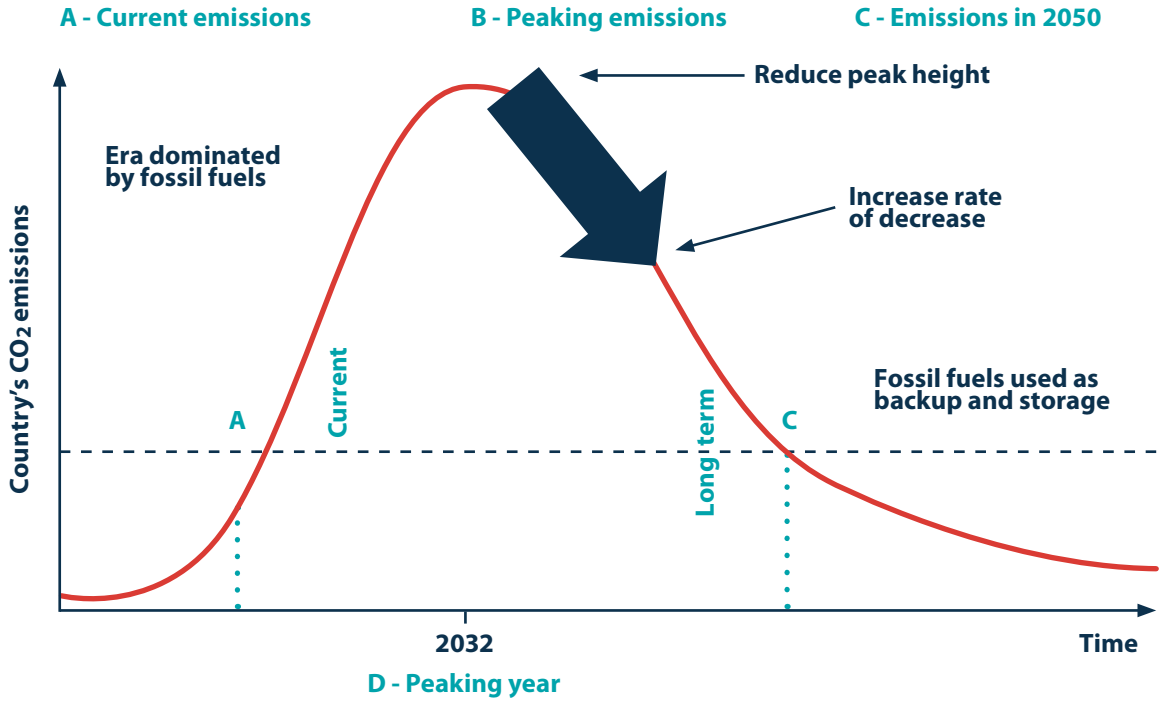
[12] Powell, L., 'Climate and the Clash Between the Diversely Developed', *ORF Energy News Monitor*, Volume 6, Issue 28, December 23–29, 2009

[13] Climate Modeling Forum, India supported by Ministry of Environment & Forests, Government of India, 'India's GHG Emissions Profile: Results of Five Climate Modeling Studies', September 2009

divergence in model assumptions, data and scenario definitions along with assumptions on GDP growth, clean energy penetration, etc., the Government has not formulated a baseline or BAU trajectory for GHG emissions.

However, currently there are efforts to create the baseline scenario and thereafter project possible trajectories based on policy formulation.

Future scenario for India's emissions trajectory



Peaking emissions

Unlike most Annex 1 economies, which are discovering transition paths that move along the blue arrow in the graph above, after having peaked and stabilised their emissions, the challenge for India is to define virtually its entire profile. The slope as emissions increase, and thereafter the stabilisation and reduction curves to 2050, all need to be described.

This is a clear illustration of the Indian policy paradigm. The first part of this complex matrix would be to define the peak. In this regard, there would be a number of considerations, some non-negotiable and perhaps some aspirational (leadership) factors.

The foremost consideration is the national challenge to reduce poverty. As per the

global development indicators published by the World Bank,[14] China has about 15.9% of its population living on less than US$1.25 per day. In India, over 41.6 % of the population live on less than US$1.25 a day, calculated on a purchasing power parity (PPP) basis. However, 800 million Indians live on less than US$2 a day, a more realistic poverty indicator. As per a McKinsey study, the recent two decades of growth has seen India raise over a 100 million from poverty and the report suggests another two decades of over 8% GDP growth will raise another 400 million of the population from poverty.[15]

Some in India suggest that poverty reduction should not be the only imperative, and that India must strive to become a mid-income country. In the next 20 years, India's middle class will grow to 40% of the population – the world's fifth largest consumer market,[16] and this clearly must form a part of the decision-making criteria. An alternative and emerging viewpoint suggests that beyond the pure GDP growth and income levels, India needs to define its development trajectory based on its ability to improve its human development index (HDI) and social infrastructure. India's literacy (67% in 2007) is well below the global average of 84%. According to a WHO-UNICEF report,[17] of the 1.1 billion people worldwide without any access to toilets, 638 million (58%) are from India alone. 40% of towns and villages have poor or no road/rail connectivity, leaving them outside the economic development that India has witnessed in recent years. Healthcare, infant mortality levels and gender issues will all need to be significantly improved and the response to these must be central to any development plan adopted by India.

A growing minority – more aligned and sensitive to the Annex 1 position – suggests that India needs to be more aggressive in positioning itself within the 'carbon game' and must strive for leadership. This would include making some unpopular and expensive development (technology) choices, and would involve larger resources devoted to research, development and deployment of green technologies as well as enacting sustainable urban and transport policies. This aspect has already received substantial attention from the current Indian leadership that visualises India as an emerging economic power that must leverage this new economy. India's National Action Plan on Climate Change has envisaged a host of initiatives for solar energy production in India. These include increasing the use of this technology in order to deploy 20,000MW of solar capacity by 2020.[18]

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[14] The World Bank, World Development Indicators 2008; http://data.worldbank.org/indicator

[15] McKinsey Global Institute, 'Tracking the growth of India's middle class', August 2007; https://www.mckinseyquarterly.com/Tracking_the_growth_of_Indias_middle_class_2032

[16] McKinsey Global Institute 'The 'bird of gold': The rise of India's consumer market' (executive summary), May 2007; http://www.mckinsey.com/mgi/publications/india_consumer_market/index.asp

[17] WHO-UNICEF, 'Progress on Sanitation and Drinking Water: 2010 Update'; http://www.unicef.org/eapro/JMP-2010Final.pdf

[18] Prime Minister's Council on Climate Change, Government of India, 'National Action Plan on Climate Change'

In terms of wind energy, India already has the fifth largest wind capacity in the world[19] and India's Eleventh Five Year Plan (2007–2012)[20] has envisaged that India will add 9,000MW of wind energy[21] as well.

However, given resource constraints, the path that India adopts in the coming years may not be able to address each of the above domestic drivers, and tough choices await the country. Irrespective of the choice, all responses will require substantive investments in energy and infrastructure including transport, water, education, health and a calibrated approach to agriculture and the rural economy that still sustains over half of India.

India's power dilemma

According to the Central Electricity Authority, India's installed energy capacity for thermal power as of February 28, 2010 is 100,599MW. India's total capacity is 157,229MW. Nuclear energy is at 4,340MW, hydro energy is at 36,863MW and according to the Ministry of New and Renewable Energy, green energy is at 15,427MW. Captive power-generating capacity connected to the grid is an additional 19,509MW.[22] India's per capita energy consumption is less than 500kgoe (kilogrammes of oil equivalent), compared to the global average of 1,800kgoe.[23] According to India's *Integrated Energy Policy: 2032*[24], the projected per capita energy consumption would be well below the 2003 levels in developed countries. Even to meet this modest energy supply, the required installed capacity that India would need for 2031–2 would be 760,000MW at 7% annual GDP growth and 960,000MW at 8% growth;[25] between 4.5–6.0 times the current capacity. Since the power sector emissions contribute nearly half of the per capita emissions[26] in India today, this sector alone would contribute an additional 3.5–4.0tCO_2 per capita by 2032. This, in a sense, is the Indian dilemma and the global concern.

Power sector investments have long lifecycles of 30–40 years, and therefore will shape India's abilities to reduce emissions to 2tCO_2 per capita by 2050. However, even if India was to opt for green alternatives for a fourth of the new

[19] World Wind Energy Association, 'World Wind Energy Report 2008', February 2009

[20] http://www.planningcommission.nic.in/plans/planrel/11thf.htm

[21] 'Atlas to guide in tapping of wind energy launched', *The Hindu*, April 30, 2010

[22] Facts and figures on installed energy capacity, as stated by Central Electricity Authority of India; http://www.cea.nic.in/

[23] Ministry of Environment and Forests and Ministry of Power, Bureau of Energy Efficiency, Government of India, 'India: Addressing Energy Security and Climate Change', October 2007; http://envfor.nic.in/divisions/ccd/Addressing_CC_09-10-07.pdf

[24] Planning Commission, Government of India, New Delhi, 'Integrated Energy Policy: Report of the Expert Committee', August 2006

[25] Central Electricity Authority and Confederation of Indian Industries, 'White Paper on Strategy for 11th Plan', August 2007 August 2006

[26] Indian Network for Climate Change Assessment, Ministry of Environment and Forests, Government of India, 'India: Greenhouse Gas Emissions 2007', May 2010

generating capacity, an estimated additional annual expenditure of US$258 billion may be required.[27] These funds are not forthcoming and the irony is that the Annex 1 countries, many of whom are facing severe economic meltdown, may not be able to meet their financial obligation towards the climate response.

India's transport dilemma

India's existing Achilles' heel has been its transport sector. Significant investments are underway and the current five year Plan[28] has estimated that the total investment in infrastructure during this period would be US$514.04 billion. Of this, roads and bridges are at US$78.54 billion, railways at US$65.45 billion, ports at US$22 billion and airports at US$7.74 billion. The positive aspect of this investment is the growing emphasis on moving traffic from road to rail and creating dedicated corridors for high density routes which can save up to 347–500MtCO2-eq in the next 20 years.[29] Some of the projects in this period include the creation of dedicated rail freight corridors between Delhi–Mumbai and Ludhiana–Kolkata; modernisation of 4 metro and 35 non-metro airports; constructing 7 green-field airports; further developing the Golden Quadrilateral highway network (connecting Delhi, Mumbai, Kolkata and Chennai) and other national highways; as well as developing 1,000km of expressways and construction of 129,707km of rural roads in India.[30]

Each of these endeavours is carbon intensive (large quantities of steel, cement, fossil fuel and power are needed) and will test the ability of the country to improve its carbon intensity of GDP going forward. The climate nightmare is, however, the estimated increase in the car density. Currently, India has 8 cars/1,000 people; China 15/1,000; Brazil 165/1,000 and the USA 500/1,000. By 2050, India is likely to have 382 cars/1,000 people with Brazil having the highest number (645/1,000). The transport sector that currently contributes less than 10% of total Indian emissions is likely to double in the next 20–30 years. Transport policies and the introduction of mass rapid transport systems could significantly change the nature of the emissions profile in this sector, and as in the case of power, this would require investments from within and outside the country.

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[27] Figure calculated using the estimate of 3,880 billion kWh given by the Integrated Energy Policy Report (IEPR) of total energy requirement in 2031–32 at 8% GDP growth. 25% of this figure was multiplied by Rs12 which is the average price for a basket of renewable energy sources such as solar, wind and biomass. The final figure was converted into US$ using an average exchange rate of Rs45 to the US$.

[28] The Secretariat for the Committee on Infrastructure, Planning Commission, Government of India, 'Projections of Infrastructure during the Eleventh Plan', August 2008

[29] 'Goyal, A., 'Carbon Mitigation Strategies in Transport Sector – Complex issues Involved in Designing India's Ultra Low Carbon Mega Rail Projects', presentation given at Observer Research Foundation, New Delhi, November 19, 2009

[30] The Secretariat for the Committee on Infrastructure, Planning Commission, Government of India, 'Projections of Infrastructure during the Eleventh Plan', August 2008

India's agriculture dilemma

The least discussed sector globally is the agricultural sector. According to the International Food Policy Research Institute (IFPRI), it accounts for 20% of India's total GHG emissions.[31] While CO_2 emissions in agriculture are barely 1% of the total, Indian agriculture accounts for 50% of India's methane (CH_4) emissions. Nitrous oxide (N_2O) emissions, at 0.31Mt, account for an even larger share. India's livestock population is estimated to grow to 636 million by 2020. India's paddy cultivation area of 432.3 million hectares is the largest in Asia, and accounts for the bulk of GHG emissions from agriculture. Though flood irrigation of rice is the second largest source of GHG emissions from agriculture, India's per hectare emissions from rice cultivation are approximately 10% of the global average.[32] Due to the highly sensitive and political nature of this sector, it is unlikely that any drastic policy changes could be expected. Perhaps, through the reorientation of consumption patterns and more directed subsidy schemes for the farmers, the emphasis on wheat and rice in agriculture could be reduced. Traditional grains may need to be reintroduced due to their drought-resistance and their suitability to the local agricultural conditions.

India's peaking year dilemma

The other important determinant of India's emissions profile would be the timeline for 'peaking' its emissions. There already is intense international pressure on most emerging economies on this, and once an international agreement is signed in the coming years, there will be limited time available. However, success in achieving the goals of poverty reduction, infrastructure and social development must clearly inform the peaking year and must continue to remain non-negotiable for India when committing to any global timeline. The rate and pace of success in domestic action on these aspects will clearly involve strong central political leadership, and more importantly, a universal political buy-in from the 28 Provincial Governments is necessary to drive transformation at the grassroots if such change is to be effected. Success will clearly depend on the governance and institutional capacity (finance, know-how, skills) to mitigate existing deficiencies and steer their constituents towards a sustainable economy.

There are two nuances of the pace of change that must be briefly discussed. The first is how soon can the old economy relinquish its old models and opt for the new; and if the old economy is unwilling, then how soon can the green companies muster sufficient political capital to influence policies and governments? There is an underlying face-off between these two business models and the outcome will certainly influence the pace of transformation. This is further complicated by the fact that the

[31] Nelson, G.C. et.al, 'Greenhouse Gas Mitigation: Issues for Indian Agriculture', International Food Policy Research Institute discussion paper, September 2009; http://www.ifpri.org/sites/default/files/publications/ifpridp00900.pdf

[32] Climate Challenge India, 'India: Strategies for Low Carbon Growth'; www.climatechallengeindia.org/.../158-India-strategies-for-low-carbon-growth

old businesses (oil and gas, aviation, power companies, et al) are, in addition, IPR owners of the new green technologies.[33] This adds an additional economic dimension on how soon the new technologies can replace the fossil-fuel-based economy. It is the oil and gas companies who may actually decide the price point and the time for the commercial applications of existing green alternatives such as solar, wind and CCS (carbon capture and storage). If mass deployment of these technologies has to be achieved in bottom-of-the-pyramid economies like India and China, some innovative pricing mechanisms may

GHG stabilisation costs for a 550 ppm target, relative to a 'base case' [34]

Scenario	Global cost	Non-Annex I share of costs	Annex I share of costs	Non-Annex I cost	Annex I cost
Base case set 1	$1.00	0.72	0.28	$0.72	$0.28
2020 set 2	$1.12	0.69	0.31	$0.77	$0.35
2035 set 2	$1.28	0.65	0.35	$0.83	$0.45
2050 set 2	$1.65	0.59	0.41	$0.97	$0.68
2020 set 3	$1.47	0.38	0.62	$0.56	$0.91
2035 set 3	$1.69	0.34	0.66	$0.57	$1.12
2050 set 3	$2.39	0.28	0.72	$0.67	$1.72

*Source: derived from tables 2 and 3 of Edmonds et al;[35] **set 2**: delayed emission reductions, abrupt increase in carbon prices; **set 3**: delayed emissions reductions, phased increase in carbon prices*

[33] Tannock, Q., 'The Economics of Climate Change: Taking the Lead, IP Ownership' Presentation at Chevening Fellows Lecture, Wolfson College, Cambridge, January 28, 2010

[34] 'Base case' = universal harmonised carbon tax sufficient to meet the stabilisation target implemented without delay Lecture, Wolfson College, Cambridge, January 28, 2010

[35] Edmonds, J., Clarke, L., Lurz, J. and Wise, M., 'Stabilizing CO2 Concentrations with Incomplete International Cooperation', *Climate Policy* 8(4):355–376, 2008 Lecture, Wolfson College, Cambridge, January 28, 2010

need to be devised to make them attractive and affordable.

The second nuance is perhaps equally compelling. As per a study by Edmonds et al,[36] there is an economic and moral argument for emerging economies like India to delay the peaking of emissions. In the table on the previous page, if the emerging economies were to introduce a carbon tax (i.e. a price for carbon) in a phased manner as per the **2050 set 3** scenario, their burden towards bearing the cost of mitigation would be 28% of the global effort. In comparison, if the emerging economies were to act now (2012), their burden of mitigation would be as high as 72% of the global effort. Clearly, there is a moral argument for the Annex 1 countries to bear a larger share of mitigation costs under **2050 set 3**.

However, if the Annex 1 countries, under any global agreement, were to compensate unconditionally the cost of transition for the emerging economies early transition could be achieved and global economic costs would be minimised. The deliberations at Copenhagen suggest otherwise. The commitment of funds to the global cause is 'back-loaded', with larger contributions only flowing from the Annex 1 countries at the end of the decade and beyond (projection). Early peaking of emissions will require front-loading of fund flows by Annex 1 countries.

Consumption dilemma

A day after the conclusion of the Copenhagen Summit, two narratives appeared in newspapers. The first described the role (negative) of India and China at Copenhagen which led to a watered-down agreement in the form of an 'Intent of Parties'. The second media report highlighted how China, India and the Philippines are leading the global economic recovery by the virtue of their consumption market.[37] This, in essence, is the climate paradox. China and India are expected to consume and help the global economic community and are also expected to reduce emissions to protect the climate. If in 2050 China and India account for 50% of the incremental emissions,[38] in the same year, household consumption and transport will contribute over 60% to global emissions.[39] As per a report by the US Department of Energy, only 25% of the emissions in the USA are from the industrial sector, while transportation and commercial sectors contributed more than 50%. Furthermore, 15% of the CO_2 emissions come from the residential sector, which indicates that more than 60% of US emissions are directly

[36] ibid

[37] 'India & China Leading World Recovery The Economic Times, November 15, 2009

[38] Shalizi, Z., '*Energy and Emissions: Local and Global Effects of the Rise of India and China*' in Winters, A.L. and Yusuf, S., *Dancing with Giants: China, India and the Global Economy*, World Bank Publications, 2007

[39] Sanwal, M., 'Climate Change and Global Sustainability: Need for a New Paradigm for International Cooperation' paper presented at the Global Summit on Sustainable Development and Climate Change, New Delhi, India; organised by Observer Research Foundation, India and Rosa Luxemburg Foundation, Germany, September 24, 2009

[40] US Department of Energy, Energy Efficiency & Renewable Energy, *2005 Buildings Energy Data Book*, August 2005

linked to the consumption patterns of individuals and households in the USA, which are shaped by their lifestyles and behaviour.[40]

Today, India's affluence is not significant enough to impact its emission profile, but by 2050, personal consumption, personal transport and leisure and travel have the potential to be the most significant source of CO_2 emissions. Even as India grapples with placing sustainability at the heart of its infrastructure and energy investments, consumption emissions still evade attention. This is the direct product of the lack of a similar debate in the Annex 1 countries. As per the IEA (International Energy Agency), despite an improvement of over 25% in energy intensity of GDP in both Europe and the USA, total emissions have only fallen by 1.5% in Europe, while in the USA they actually increased by 16.3%, due to a higher growth rate fuelled by increasing consumer demand. Furthermore, the use of electricity by appliances such as refrigerators and computers has increased by 48%, service sector electricity consumption increased by 50% and in households it increased by 35%.[41]

World marketing budgets for the top six industries (2005)[42]

Industry	Percentage of revenue	Marketing spend (US$ billion)	GDP contributions (US$ billion)
Finance and insurance	6.8	68.2	1,003
Information (including media)	10.5	59.2	564
Manufacturing	7.8	120.1	1,540
Other services	10.4	29.8	284
Professional, scientific, and technical services	7.2	58.8	817
Retail trade	11.5	94.6	822
All business	8.9	1,073.5	12,099

Even in the UK, over 50% of emissions are based on lifestyle. And if a reduction in emissions of 80% by 2050 is to be achieved, nearly half of the reduction would have to flow from the lifestyle carbon account. Can the global community achieve this? In the

[41] International Energy Agency (IEA), *Energy in the New Millennium; Trends in IEA Countries*, 2007

[42] BlackFriars Communication, Inc., 2005; http://blackfriarsinc.com/sizing-release.html

USA alone, over US$1 trillion are spent annually on advertising and marketing. If marketing were a vertical industry, it would represent close to 9% of the GDP of the USA, and it would rank as the fifth largest industry, behind manufacturing, government, real estate and professional services.

The total marketing costs are estimated in the vicinity of anywhere up to US$5 trillion globally. Some of the most popular advertising choices are the cartoon channels which are the most profitable of all media properties.[43] What does this imply? Much of the US marketing spend in the US is targeted at children below 10 years of age: teaching them the virtues of motor cars, electronics, houses and holidays.

At a young age, a powerful marketing force inculcates the fine art of carbon emissions into the very being of every child. And what is the global response? The mightiest nations get together at Copenhagen and very proudly announce an increasing commitment of up to US$100 billion a year to curtail emissions. It is an unequal battle. Even from these committed funds it is unlikely even a dollar would be spent on behaviour change and curtailing lifestyle emissions.

The global discourse continues to largely ignore this most important half of the equation; you and I as consumers. India and any emerging economy can do very little to manage this end of the equation. They are susceptible to international marketing forces, the unfolding globalisation and the growing aspirations of their own populations. In the period that they were discarded as the 'third world', each one aspired to the American dream. Now the question is, can the planet sustain an additional 2 billion Indian and Chinese living this dream?

If the global community is committed to capping our emissions at 450ppm by 2050, significant global efforts and policies would need to be designed to reverse this 'consumption pollution'. Should policies be based on curtailing advertisements on children's television channels, or should there be greater censorship on the products advertised? Should the media be reigned in? Or should the last mile to the consumer be controlled? These are all questions that societies, national governments and the international community will need to respond to.

Conclusions

The Indian response to climate change will clearly be conditioned by the global negotiations, domestic compulsions and the aspirations of its people. While most economists believe that pricing carbon or offering incentives to green alternatives for development are the most efficient tools of policy, it is also apparent that

[43] See, for example, Johannes, A., 'Chevy Forms Multi-Million Dollar Deal with Nickelodeon', May 26, 2005; http://promomagazine.com/news/chevynick/

[44] 'Report of the World Commission on Environment and Development: Our Common Future', UN Documents, 1987; http://www.un-documents.net/wced-ocf.htm

harsh decisions and 'command and control' alternatives may also be appropriate if emissions are to be curtailed. The striking similarity between the Bruntland Report[44] and the Stern Review is that both criticise the existing liberal market framework as being the cause of unsustainability and in their conclusion, both reassert the primacy of the market in seeking a solution.

Governance cannot be ceded to markets and policy must be the purview of the polity. Tough decisions are also in store with respect to deployment and dispersion of green technologies. Should intellectual property rights (IPR) be subject to 'must provide' regulations and compulsory licensing, or should new ways of protecting IPR be developed while encouraging their wider dispersion?

The distorted markets that we see across the globe are unable to disseminate technology at appropriate prices. If climate cannot be discounted, why should it be the basis for profiteering? A middle, effective path needs to be discovered.

Carbon markets and carbon trade are another area of keen interest which some see as resolving the redistributive and equity debate; but this needs to be deconstructed to examine their true effectiveness. As per a World Bank report,[45] CERs (certified emissions reductions) are ineffective in controlling emissions. Since 2008, while there has been a transfer of US$7 billion to the emerging economies under the emission trading scheme,[46] critics argue the transactions are at the entity level and between elites in the west and in the east. Moreover, the allowances that were traded were generously awarded and the real impact within the EU is marginal due to this distortion.

The jury is still out on the effectiveness of the EU-ETS and similar schemes that may emerge. In the case of India, perhaps the most effective financial mechanism would be based on the market opportunities and the improved business environment going forward.

The country would need to remove licensing and policy bottlenecks and fast-track investment in sustainable businesses.

India will need to attract greater domestic private-sector and international investments in the key sectors of power and infrastructure, and compete in this process with other countries that offer similar opportunities. India has already introduced feed-in tariffs and other regulatory incentives[47] to support the development and deployment of renewable energy, in order to ensure a significant component of future growth is sustainable.

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[45] The World Bank Institute, Washington DC, 'State and Trends of the Carbon Market 2009', May 2009; http://siteresources.worldbank.org/EXTCARBONFINANCE/Resources/State_and_Trends_of_the_Carbon_Market_2009-FINALb.pdf

[46] ibid

[47] Tyagi, A., 'Renewable Energy Holds Promising Future in India" April 18, 2008; http://www.renewableenergyworld.com/rea/news/article/2008/04/renewable-energy-holds-promising-future-in-india-52214

However, if innovation and intellectual property will be the key resources that will fuel the new economy, then India must invest in its human resources and research and development (R&D). Its current level of less than 1% for R&D is unacceptable and it must at the earliest opportunity strive for the OECD level of 2.25%.[48] School education and quality university education, along with a culture of innovation, can ensure that India uses its over 1 billion population gainfully in a new world energised by intellect and fuelled by technology.

[48] OECD, *OECD Science, Technology and Industry Scoreboard 2007: Innovation and Performance in the Global Economy*, OECD Publishing, 2008

Climate Change and Trade

Raymond Yuantang Yu, China

In the climate change discussion, trade does not feature as prominently as do the scientific, political and economic issues. Internationally, the World Trade Organisation (WTO), UNEP, the World Bank as well as the International Institute of Sustainable Development (IISD) have conducted some interesting, substantive research. However, much remains to be done. This essay attempts to capture the ongoing discussions and make recommendations on the way forward.

Competitiveness, carbon leakage and border carbon adjustments (BCAs)

Some proposals have been tabled in Europe and the USA to introduce some form of border carbon adjustments (BCAs) or even border tax adjustments (BTAs). For example, in the USA, the Waxman-Markey Bill proposes border adjustments. In the EU, France has been actively advocating the introduction of border tariffs to address competitiveness concerns that high costs arising from the application of domestic environmental policy will result in relocation of production and jobs to countries that do not have equivalently strict policy limitations on carbon emissions. The EU as a whole is scheduled to make a decision by June 30, 2010 as to whether to take this idea on board. There are press reports that Canada, Australia and Japan are thinking along similar lines.

However, based on current empirical evidence, there is little support for the idea that competitiveness poses a problem for Annex I (developed) countries within the context of the UNFCCC and the Kyoto Protocol. A number of key sectors are potentially at risk: steel, cement, some chemicals, aluminium, pulp and paper. According to the IISD, typically less than 1% of GDP is impacted in the countries analysed.

BCAs or similar measures are more likely than not to be WTO-incompatible

GATT Article XX is the most likely legal haven for any trade measure designed – in name or substance – to reduce greenhouse gases and combat global warming. Some are encouraged by the provisions contained in GATT Article XX(g) – to the effect that environmentally related trade measures can be taken in the name of protecting exhaustible natural resources so long as domestic production or consumption is also subject to the same restrictions. Most people, however, are more firmly convinced that the chapeau of GATT Article XX makes such restrictive measures WTO-incompatible. Equally importantly, it is almost impossible to argue that trade measures based on production and

process methods (PPMs), however legitimate their regulatory intents or purposes may be, are legal within the meaning of the WTO. This is based on other GATT provisions on non-discrimination, given the fact that high carbon and low carbon goods are, in essence, like products within the meaning of GATT Articles I and III.

BCAs and similar measures will be difficult to administer

Even if WTO legality issues can be resolved, BCAs and similar measures will be extremely difficult to administer, and thus their efficiency and effectiveness are questionable. Unless measurable, reportable and verifiable (MRV) methodologies are uniformly or universally agreed and adopted at the international level, accurate, objective and usable data will be impossible to come by. Manufactured goods will bear the brunt of the challenges, although agricultural products and other products like arts and crafts will also feel the pinch. Unless calculations can be done rapidly on shipments, ports in importing (and sometimes exporting) countries will be so piled up with goods that the queue will be too long and difficult for national governments. A challenging question will be how to determine the countries subject to such trade restrictions and decide on what to do with products coming from countries where stricter environmental standards are in place.

The way forward is uncertain

There are several possible options that merit attention and are worth exploring further. First, WTO members can show political will, reduce or eliminate tariffs on environmental goods (although the list of such goods defies an easy answer), liberalise environmental services and, more importantly for developing country members, boost technology transfer (a key demand from developing countries at Copenhagen).

Second, the WTO dispute settlement body (DSB) can produce a more clear-cut interpretation about the legality of BTAs or BCAs. Several points deserve close scrutiny. One is whether the kind of expansive or evolutionary interpretation developed by the WTO DSB in the USA shrimp case[1] can be continued and broadened into a ruling that air is an exhaustible natural resource. Thus, provided that other provisions in GATT Article XX and other GATT articles are met, trade restrictions can be imposed on the grounds of environmental protection and climate change action. Another question is how the WTO General Council or Ministerial Conferences will look at such DSB rulings; any decision that is opposed by a majority of WTO members runs the danger of being overturned.

A third point is about the applicable law within the WTO dispute settlement proceedings; more specifically, the debate boils down to the issue of whether the legal provisions contained in multilateral environmental agreements (MEAs) can be invoked in dispute settlement proceedings.

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[1] http://www.wto.org/english/tratop_e/envir_e/edis08_e.htm

It is worth noting that, in the mandate for the Doha Round of WTO negotiations, the Committee on Trade and the Environment are indeed looking at some of the elements outlined in the above points; with regrettably, very little progress.

Fourth, a so-called peace clause or escape clause might be desirable, designed along the lines of the Generalized System of Preferences (GSP) that violate GATT Article I (MFN, most favoured nation) as trade concessions and preferences granted by developed country members to less developed ones. This prospect has attracted some academic interest, but admittedly the chances are very slim given the fact that any such measure acts to target, instead of benefiting, less-developed WTO members.

Fifth, based on the successful experience of the Montreal Protocol on Substances That Deplete the Ozone Layer, it is conceivable and desirable that the negotiations within the framework of the UNFCCC and the Kyoto Protocol might be able to agree on the nature, scope and coverage of trade measures that member governments can impose as part of global efforts to deal with climate change.

Finally, whichever trade measures are contemplated and agreed upon, there is the highly politically charged debate centring on the 'common but differentiated responsibilities'. The very idea that some or all of the countries in the developing world would be asked to shoulder essentially the same global responsibilities as developed nations – regardless of their levels of economic, social and technological development – will ignite a prairie fire of global politics. This could torpedo the process of global climate change negotiations, take the core principles away from WTO law and put into doubt the continued existence of the WTO as a set of global institutional arrangements.

In conclusion, much remains unclear in the research on the relationship between trade and climate change and in the ongoing international trade and (equally important) climate change negotiations. There is a need for more international research on WTO compatibility and, perhaps most importantly, how international negotiations can arrive at a set of climate change related trade rules by taking into account the political, economic, scientific, legal and other considerations. It will be a task defying any easy solution.

AUSTRALIA

Australia – a Climate Change Impacted Country

Brad Page, Australia

Australia is potentially one of the more significantly impacted countries in the world as a result of climate change. For a country that emits less than 1.5% of total global emissions, it stands to endure some very significant environmental impacts that will have substantial implications for social and economic activity.

Australia is such a large land mass that the climate change impacts are expected to be diverse. In the northern third to half of the country, which is tropical to sub-tropical, significantly increased rainfall together with more intense and damaging cyclonic weather patterns is predicted. Fundamental infrastructure – roads, electricity, telecommunications – is vulnerable to these intensified storm patterns and activity, while flooding of and wind damage to the built environment are likely to be more common. Adaptation for these more intense weather events is required, especially as the population in the north of Australia is growing strongly as a result of booming mineral and energy resource industry developments.

In the southern third to half of the country, where much of the economic and agricultural activity of the nation occurs, climate scientists predict reduced rainfall, prolonged droughts yet almost paradoxically intensified storm weather events where damaging winds and hailstorms are more common. These changes have fundamental (adverse) implications for Australia's food production capabilities as well as for the provision of potable water where the vast majority of the population lives. Water-intensive farming practices and cropping may not be sustainable into the future, while already there are water shortages that have required enforceable usage restrictions and the construction of desalination facilities to meet the demands of a growing population. These are momentous implications for a country that is a net exporter of food and has not traditionally had to conserve drinking water.

Australia has some significant naturally occurring wonders of the world. Climate change threatens some of these. Notable among them is the Great Barrier Reef which is vulnerable to damage due to ocean temperature increases and acidification.

Additionally, Australia is a near neighbour to many potentially impacted island states. Australia consequently is looked to for adaptation support as well as regional leadership on abatement activities. Some academic studies suggest that for the lowest lying Pacific island states, inundation as a result of sea-level rise is likely and that developed nations such as Australia will need to assist with the relocation of significant numbers of displaced people.

Australia's climate change policy difficulty

Australia is in a difficult policy position on climate change. As a vulnerable nation, action on climate change is important. But acting in isolation will not solve the climate change challenge for Australia or the world. While Australia is one of the largest emitters per capita, it accounts for less than 1.5% of global emissions in total. Indeed, the annual emissions growth in some rapidly developing nations is equivalent each year to Australia's total emissions.

Australia also has some unusual economic characteristics that are especially germane in climate change policy. Very significant national income and employment results from industrial activity in energy-intensive, trade exposed industries. These include liquefied natural gas exports, aluminium smelting, mineral extraction and exporting as well as paper and pulp production to a name a few. In all cases, key competing nations do not have binding emission targets now or in prospect, and taking disproportionate climate change action by Australia will result in a loss of economic activity to competitor nations, often without any benefit in terms of global emissions. It is simply not in Australia's economic interests to take disproportionately strong actions if competing nations do not do similarly.

Clearly, a global agreement on emissions reductions is the key to addressing Australia's – and the world's – climate challenge.

However, the key avenue to achieve this has failed. In my view, the Copenhagen UNFCCC meeting demonstrated graphically that the process is incapable of resolving what some have described as the greatest environmental and moral challenge of our time.

A new global approach is required

That's why I think the only way to now get real and timely progress on climate change is to dispense with the current processes and institutions.

Always overlooked is how this lack of progress stifles investment in the technologies and mechanisms that can radically change the world's emissions. Uncertain global emissions policy equals an uncertain investment climate and a real limit on debt and equity availability for a new low-emission future. Governments have failed to unlock the potential solution from business and private equity to the climate change challenge.

The problem is that the world is locked into an inter-governmental process that is trying to deal with too many issues simultaneously. Reaching consensus between 200 member nations on every aspect of abatement and

adaptation to climate change is excessively ambitious. It means that every decision is a compromise of the first order. It gives powers of veto to undeserving parties and allows some to rig the system to achieve their own objectives that have little if anything to do with climate change. It means interminable weeks, months, even years of haggling. Yet emissions rise at an exponential rate and the outlook for the planet worsens daily.

We have to separate the processes for settling abatement objectives and mechanisms from the vital work of supporting those that will be massively impacted from climate change and are without the resources – financial, technical and intellectual – to adapt to the changes.

Achieving a +2^{O}C outcome requires about 15 nations to agree on the way forward. We need a new process to facilitate this abatement agreement.

With the Copenhagen Accord, there is at least an opportunity to carve out a means for targets and abatement pathways to be settled by the large and rapidly growing emitters to achieve the agreed temperature change objectives. Something like the G20 has a better chance of success that does the rule-bound, ponderous UNFCCC process. It wouldn't be easy but at least those making the real contributions (historically and prospectively) to emissions would be resolving what to do.

Separately, the vital work of providing the means to adapt to climate change for those least able to help themselves must continue. This involves many, if not all, nations and the forum for these discussions could take many forms. I disagree with those that contend that the least developed have no leverage if adaptation is divorced from abatement discussions and agreements. That model is leading to no agreements for anyone and is clearly flawed. It also ignores the deep appreciation in most developed nation governments that at the very least, the dislocation from climate change in desperately poor countries will lead to unacceptable suffering and refugee problems of a scale not previously witnessed, with the attendant financial, security and political costs.

To persevere with the current arrangements is a disservice to the environment, society and the global economy. A fresh approach is required if we are to have any chance of solving this most vexed of problems.

The Race Starts to a Clean Energy Economy

Brer Adams, Australia

When Bill Clinton was elected President, the USA was emerging from recession. "It's the economy, stupid", was his rallying cry. As the world emerges from a far worse recession, Clinton's axiom is especially relevant for policy makers. Other issues get relegated in times of economic hardship. Climate change, if it was only an environmental issue, could be expected to be relegated, but responding to it is fundamentally economic.

Taking action can present immediate economic benefits. As world leaders look for opportunities to spur economic growth, investment in clean energy is compelling.

While many commentators focus on the need for coordinated global action to reduce carbon emissions, there are powerful reasons for a country or region to want to build its clean energy economy regardless of international agreements. Those reasons include energy security, responding to water and food scarcity, and population growth.

Above all else, decisions on climate mitigation in the short term are likely to be based on consequences for local innovation and industrialisation – much less about concern for environment or a warmer climate.

Economic gains of taking action on climate change

The landmark Stern Report[1] predicted that taking action of climate change would cost 1% of global GDP. This estimate is based on a range of modelled assumptions which showed the cost could vary from -2 (meaning a positive addition to GDP) to 5% of GDP. Lord Stern has since revised the figure for mitigation to between 1 and 2% as a result of continued delays in getting started on meaningful global mitigation.

The cost of inaction, according to Stern, would be at least 5% and as much as 20%. In that context,1–2% cost of action is compelling. However, most of the costs of inaction will be felt many decades away. The cost of taking action now, although much lower, would nevertheless be felt sooner. Therefore, it may be tempting for policy makers to continue to avoid short-term costs, particularly during times of economic difficulty.

However, economists at the University of Cambridge suggest that action now on mitigation would yield immediate economic benefits that are greater than their costs. They modelled a range of scenarios, including

[1] Stern, N., *The Economics of Climate Change, The Stern Review*, Cambridge University Press, 2007

where action is taken only by the EU or the USA (which we will call 'going it alone'), and also where there is coordinated action by combinations of developed and developing countries. The report identified likely impacts of these on the world economy. Not surprisingly, it finds that the more global the mitigation effort, the cheaper it will be. The effect on GDP of a global effort is a boost of 0.8% by 2020, creating 10 million more jobs (that's net additional jobs) relative to no action on climate change.[2]

The report provides a reason for government negotiators to keep trying for a legally binding global deal at the end of 2010 or, more likely, in 2011. The whole world stands to gain by acting together. A more surprising finding of this research is the impact on GDP of those scenarios when countries or regions go it alone on climate action. Even then, the impact on GDP is positive, albeit small. For example, if only the USA acted, its GDP would increase by 0.43%. The benefits of this action would largely accrue in the US with very little overflow, or leakage, to other regions (for example it is predicted that China would feel barely any impact). In other words, the economic benefits to the country or region that is acting on climate change are higher than any economic losses. According to the research, "there is definite advantage in acting first and acting fast".[3] While strict emissions reductions targets impose higher initial costs, they also drive faster benefits of innovation and clean energy deployment. The benefits to the USA fall, proportionally, as other countries and regions take action. It is very likely that similar results would apply to Australia.

Impact of 'carbon leakage' in going it alone

Industry interests often argue that imposing a cost on carbon in one market but not another will result in significant economic (and carbon) leakage. This argument is particularly forceful in Australia, where carbon pricing is seen as a jobs wrecker.

Many factors influence investment decisions; the price of carbon is just one factor. Significant evidence suggests that other factors such as transport costs, local labour market conditions, product variety and incomplete information about other locations all favour local production. A further consideration is of course the costs associated with relocating business. According to modelling by Cambridge Econometrics, carbon leakage associated with the Kyoto Protocol (and the EU-ETS) has not been substantial and concerns of leakage tend to be

[2] The model assumes that revenues raised by a carbon price are effectively recycled in a way that reduces inefficiencies like employment taxes or boosts incentives to low carbon technology. Obviously, the scheme design is critical. Revenues raised by carbon pricing but not used to reduce economic inefficiencies are unlikely to yield similarly favourable results.

[3] Cambridge Economics, The Climate Group/The Office of Tony Blair, 'Cutting the Cost, the Economic Benefits of Collaborative Climate Action'

overstated.[4] Even taking into account leakage that may be substantial for some carbon-intense sectors (e.g. steel, cement, newsprint and aluminium), overall leakage is very low.

The influential think tank Centre for American Progress finds that an early mover advantage accrues important gains in domestic innovation that are far higher than any negative affects of leakage. It cites green tech innovation patents in developed countries as an example. Those countries that ratified Kyoto Protocol benefited from a 33% rise in clean technology patents since 1998 compared to Australia and the USA which did not ratify.[5]

The clean energy race has started

The head start enjoyed by competitor countries puts the USA and Australia at risk of losing a clean energy race.

The pace setters, Germany, Spain and China, are already accruing significant benefits for their economies. The renewable energy sector in Germany was responsible for 278,000 jobs in 2008 – more than the conventional energy sector's 238,000 jobs. Even at a time of global recession the sector has grown off the back of certainty in government policy. Germany is on track to generate almost half of its electricity from renewable energy by 2020. Spain, another country hit by the economic downturn, is also investing in clean energy to spur economic growth. China's commitment to the clean energy race is also unabashed.[6]

There is a growing momentum in the USA to join the race.[7] The benefits of acting unilaterally on carbon mitigation are starting to be understood by policymakers. The influential Republican Senator Lindsey Graham revealed his policy thinking at the 2010 gathering in Davos: "Six months ago my biggest worry was that an emissions deal would make American business less competitive compared to China. Now my concern is that every day that we delay trying to find a price for carbon is a day that China uses to dominate the green economy."

In the same media report, Christine Lagarde, the French Finance Minister, concurred: "It's a race and whoever wins that race will dominate economic development. The emerging markets are well-placed."[8]

Building a buffer against rising oil prices

Investment in clean energy is a hedge against higher oil prices. In this respect, energy intensive economies like the USA and Australia have the most to gain from efforts to boost generation of locally sourced low carbon fuels. The alternative – to rely on fossil fuels – means an economy acutely sensitive to a rising oil price.

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[4] Department of Land Economy, University of Cambridge, 'Carbon leakage from unilateral Environment Tax Reforms in Europe 1995–2005'

[5] Australia ratified in 2007.

[6] Centre for American Progress, 'Out of the Running?', March 2010.

[7] ibid

[8] *New York Times*, 'Race Is on to Develop Green, Clean Technology', January 29 2010

Relatively benign oil prices in recent times will assist the global economic recovery. However, rising oil prices in the future could put that recovery at risk. If oil prices were to return to the peak of US$146 per barrel in mid-2008 it would send the world economy back into recession and reduce global GDP by 3.5%.[9]

The world economy is more sensitive to oil price rises than the expected cost of climate change mitigation, whether the cost is 1–2% as Lord Stern has estimated or, of course, if the result achieves marginal benefit to GDP of 0.88% as Cambridge economists have estimated.

Productive long-term large-scale investment to fuel global growth

Although the clean energy race has already started it has a long way to go. The need to replace the high carbon foundations of the world economy will cost several trillion dollars.

This investment will yield significant economic dividends. In developed countries this will retrofit a dirty energy economy. In developing countries it will not just replace existing energy foundations, but will build them where none currently exist. The effect of this will be to yield even greater productivity gains, helping to alleviate poverty and fuel a growing global economy.

According to the Copenhagen Accord, at least US$100 billion per year is required to be spent in developing countries by 2020. This is certainly a vast sum. But putting it in context, it represents a small and manageable fraction of the world's economy, currently $50 trillion annually.

The world has witnessed other periods when investment in infrastructure surged – for example during industrialisation and after the Second World War. Rather than being a cost to the economy, these investments laid the foundations for an age of international innovation and strong economic growth. The investment that is required to fight climate change and to build a clean energy base will have a similar cost to the annual economy. It could also lay the foundations for a new wave of innovation, following along from the industrial and information revolutions of the last century, and be the catalyst for anther period of prolonged economic growth and prosperity. This growth will need to be truly global, off the back of a global agreement on climate change. The timing of that agreement matters little, but the certainty that it will eventually emerge is critical. It is then that first mover advantage yields real benefits and countries and regions have reason to compete.

The winner of the race will ultimately be future generations who will inherit a stable climate – even if what fired the starter's gun was the economy, stupid.

[9] Cambridge Economics, 'The Impact of Oil Prices on the Global Economic Recovery', 2009

EUROPE & RUSSIA

Modelling the Low Carbon Economy in Romania

Cristian-Marius Moisoiu, Romania

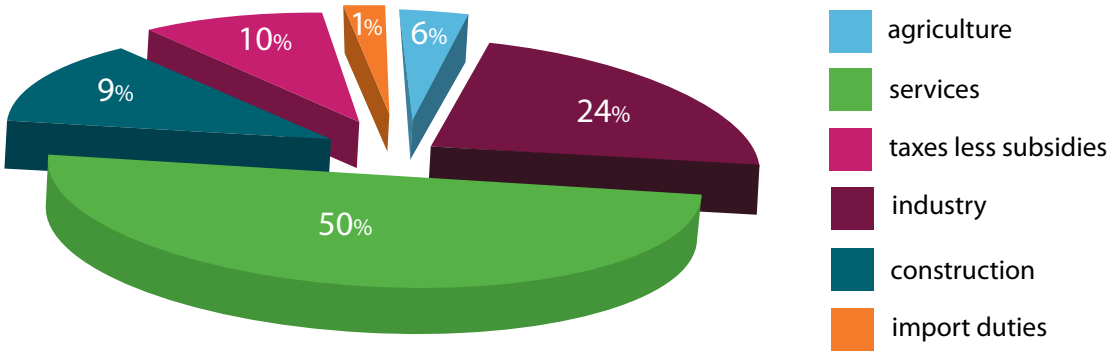
Abstract

The Romanian economy has made the transition to a market economy and has integrated itself in the internal market of the European Union (EU). Romania has adopted the EU 20-20 targets (20% emissions reduction over 1990 by 2020) for reducing greenhouse gas emissions and has thus engaged in the transformational process towards a clean economy. Through its specific conditions – poor physical infrastructure, a low level of GHG emissions, a large amount of unused land suitable for agriculture, good potential for renewable energy and skilled human resources – could Romania leapfrog and offer its own model of a low carbon economy?

Main facts and figures

Romania is a mid-level country with regard to its size and population, and has been a member of the EU since 2007.[1] The Romanian GDP in 2008 was €136 billion; Romania is one of the emerging economies in the EU, if we consider the level of GDP per capita and other wellbeing indicators. In the last ten years, the Romanian GDP has almost doubled, with a strong annual economic growth of 6% on average, followed by a downturn in 2009 of 7%, caused by the economic crisis, public deficits and the dependence on foreign capital. Under normal conditions, Romania had made up some of the gap, from 35% to 45% of average EU GDP per capita.[2]

Structure of GDP



Source: National Statistics Institute of Romania, Annual Statistics Report 2008

[1] Romanian Government, 'National Strategy on Sustainable Development until 2030', 2008

[2] European Commission, 'The National Development Plan for the period 2007–2013', 2005

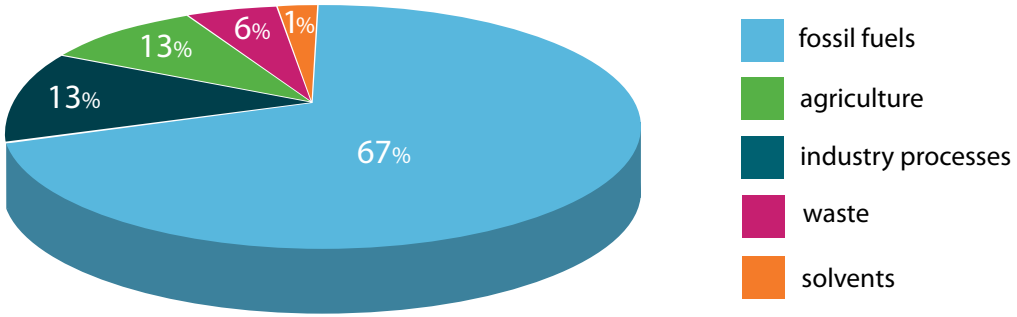
In the past 20 years the Romanian economy underwent a long and painful period of transition from a centralised to a market-based economy. The macroeconomic policies were focused on the implementation of reforms, liberalisation and privatisation, carried through by a restrictive fiscal policy and supervised through several stand-by agreements with the IMF, to ensure macro stabilisation. All these left their imprint on the lifestyle of citizens and on Romania's economic development. In many cases, these policies had negative effects in certain mono-industrial areas, generating social issues that delayed the reforms. The gap between different social groups, between rural and urban economies and between regions deepened.

Economic growth was not always accompanied by an increase in productivity, added value or competitiveness. On the contrary, the gross nature of existing fixed assets held back consumption for many years. Internal demand was stimulated through massive imports, which became the main engine of the economy. The single sector of economic activity that increased in productivity was the tertiary sector – the service sector.

The other sectors were consumptive, energy intensive and less productive. In industry, only a few manufacturers succeeded in the restructuring process; the ones which were rapidly privatised gained in productivity. Examples were in textiles, electrical equipment, food and drinks, cigarettes, the auto industry, furniture and the transport industry. In heavy industries, metallurgy and ferrous products still produce added value on a good scale. Industries such as the extractive industry and petrochemicals are doing poorly as they were largely subsidised to survive.

With regard to environmental issues, due to the transformations that took place in the economy, the level of GHG emissions in Romania has reduced consistently, from 246MtCO_2-eq in 1990 to 157MtCO_2-eq in 2006, which is the equivalent of 7.3 tonnes of CO_2 per

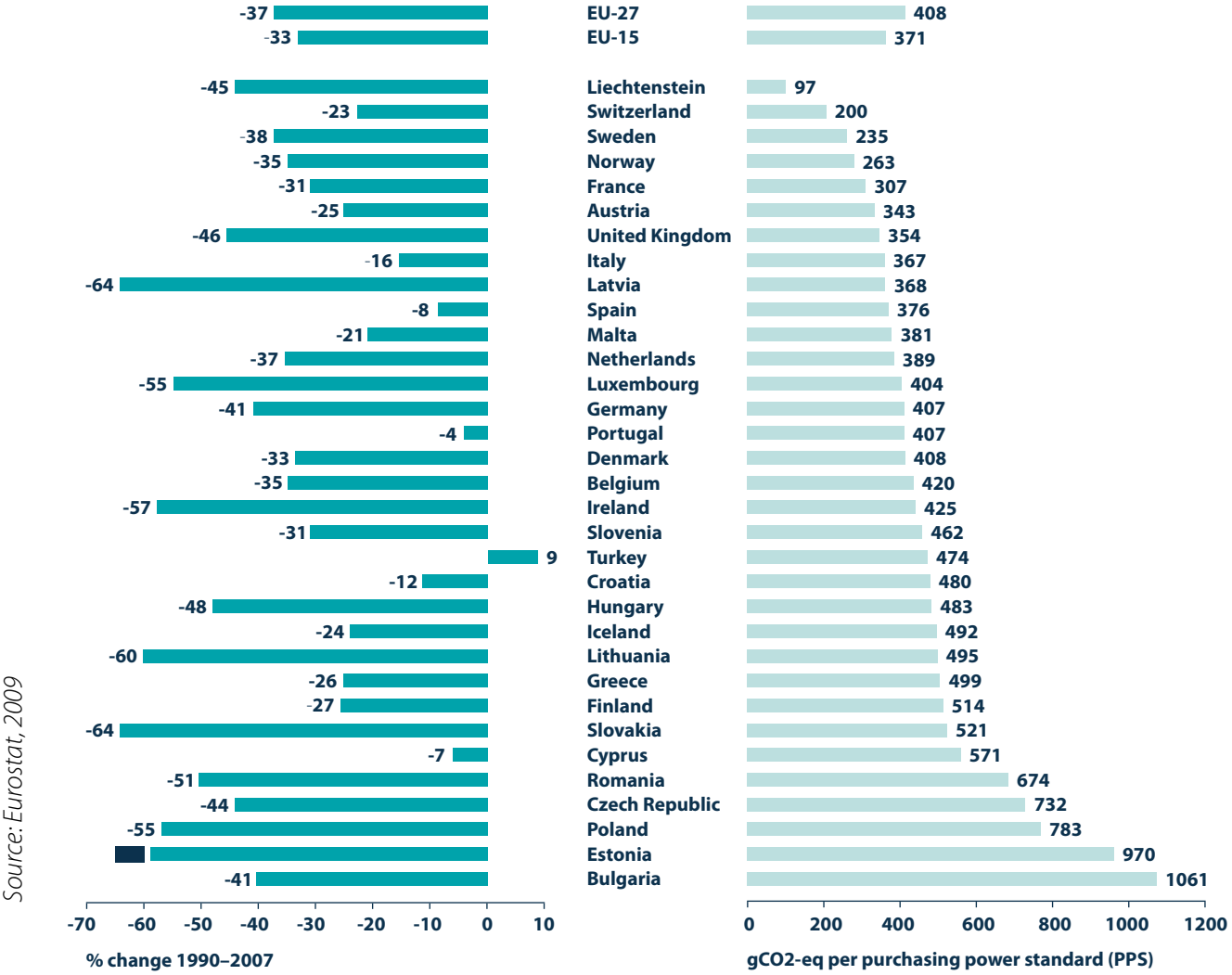
Sources of CO_2 emissions



Source: National Statistics Institute of Romania, Sustainable Development Report

capita.[3] In comparison with the other EU Member States, this level of GHG emissions is below average with regards to the CO_2 per capita indicator, but is one of the highest in the intensive GDP indicator.

GHG emissions versus GDP purchasing power standard (PPS) ratio in EU and EU candidate countries



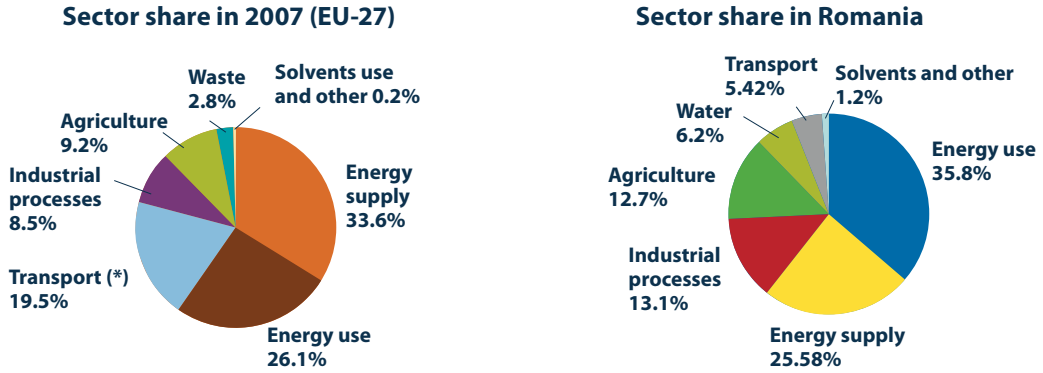
Source: Eurostat, 2009

[3] National and Eurostat data

It is clear that the Romanian economic structure, and therefore GHG emissions, differs slightly from that of the EU and obviously a strong connection exists between the energy sector and the level of GHG emissions.

Romania's transport sector is still at a lower level than the EU in GHG emissions, due to the lack of physical infrastructure. Romania's agriculture is very intensive in emissions, probably due to the degradation of land and excessive use of chemical fertilisers. The management of waste is also lagging behind, but this problem is now on the agenda of central and local authorities, due to the fact that Romania is implementing directives regarding waste management. Regarding energy supply, a large number of installations will require new technologies or retrofits to bring down emissions. This will be resolved through the ETS mechanism.

Sources of GHG emissions, a comparison of the EU versus Romania



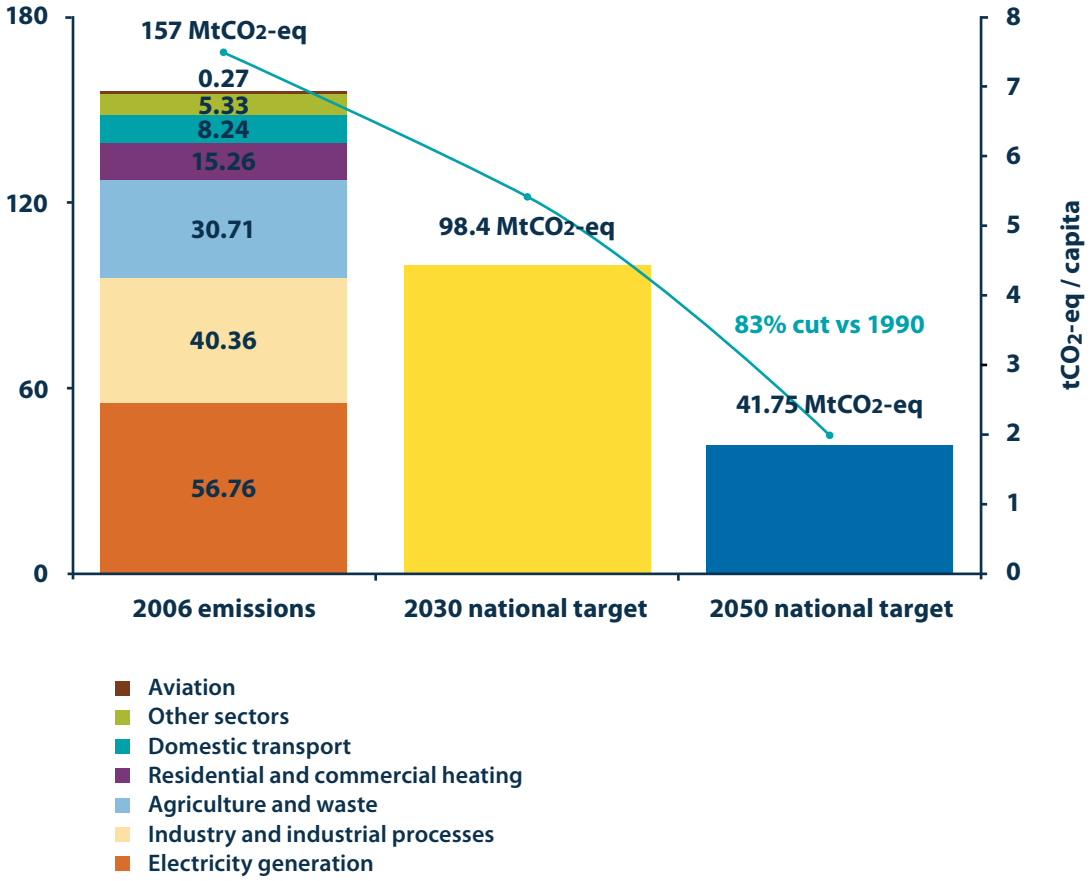
Source: Eurostat, INSSE (National Institute of Statistics) Romania, 2009

The national carbon sink capacity is 58.6 million tonnes, equivalent of 37% of the total level of GHG emissions.

31% of total emissions arise from energy demand, with a resulting CO_2 intensity in energy consumption of 0.0476 tonnes/million lei. The energy demand in the different sectors of the economy is 40% in industry, 31.6% in households, 17.3% in transport, 1.1% in agriculture and 10% in other sectors.
A transformational change towards a low carbon economy would look like the following figure, which suggests that more than 80% of the actual GHG emissions should be reduced by 2050. The national sustainability strategy envisages a reduction of 40% of GHG emissions reported at the 2005 level. By 2050, an 80% reduction is the equivalent of 2–2.5 tonnes CO_2 per capita.

Due to the fact that the energy sector and industry sector are covered by EU-ETS, it is most probable that the price of carbon will be the main driver of change in these particular sectors, followed by strong internal policies mainly regarding energy security policy and industrial policy. Real concerns are in the sectors not covered by ETS, which are mainly agriculture, transport and buildings. In these sectors, the national and EU programmes should be more tightly linked to the emissions reductions commitments. Otherwise, Romania will face serious troubles in reaching the reduction targets.

Emissions reductions challenge



Source: author's assessment, based on national statistics data

Development policies

Are the European Commission's (EC) policies and Romania's national policies linked together in order to address the commitments in reducing emissions, and to offer solutions to clean development within the EU?

The main national instruments of economic policies are industrial policy strategy, energy security strategy, information society strategy, education law, civil and penal laws and the social security systems including the private pension system.

The main instrument of public policy, financed by European and national funds is the National Development Plan, which was established and adopted by the Government in 2005, and negotiated and accepted by the (EC) for the period 2007–13. Based on the National Development Plan, the National Strategic Reference Framework was established, which is the financial plan of development. This is the strategic document that makes the connection between the national development plan and the priorities at the European level, the Community Strategic Guidelines 2007–13 and the Guidelines for Growth and Jobs 2006–08. Another policy instrument, the National Reforms Plan, is a more specific, correlative instrument for the EU Lisbon Strategy and undertakes the EU competitiveness objective of the EU as a whole becoming the most competitive knowledge based economy by 2010.

The general objective of Romania's development plan is to reduce the economic and social gap between Romania and the EU Member States, by generating additional economic growth of 15–20% of GDP by 2015.

The priorities settled with the European Commission are to:[4]

- develop basic infrastructure to European standards. Infrastructure investment will improve road and rail networks, and navigation on the River Danube – Trans-European Transport Network (TEN-T) priority axes no. 7, 18 and 22 – as well as supporting business growth and job creation. Investments will also improve the accessibility and inter-connectivity of the national, county and local roads, railways, airports and river services including improved links to TEN-T routes;
- increase the long-term competitiveness of the Romanian economy. This gives support to business start-up and growth – particularly, through investing in higher added-value products and services. Innovation will be encouraged as well as the application of R&D to market opportunities; access to finance and ICT connectivity will be improved. SMEs will benefit from investment aid and will be supported by quality business advice and the services they require to expand and create jobs. Tourism will also be encouraged as an important driver of development;
- develop the more efficient use of Romania's human capital. The strategy aims at supporting the education and training

[4] European Commission, 'The National Strategic Reference Framework for Romania 2007–2013'

systems to provide greater access to good, flexible education and skills training for individuals;

- build an effective administrative capacity; and
- promote balanced territorial development.

Similar to the National Development Plan is the National Rural Development Programme, which is the foundation for the common agricultural policy, used to plan financial support for agriculture and fisheries.

What both programmes underline is that investments and competitiveness in Romania still need to be improved in order to accelerate economic growth and secure income convergence with the EU. In terms of a low carbon model, the rules and targets are different. Economic growth is not enough to ensure resilience. We need a totally new strategic approach to ensure green competitiveness. The development plans, in which each Member State engaged, were adopted in 2005, when the discussions on reducing emissions and energy security were just beginning.

The Rural Development Programme confirms that although rural communities make a small contribution to economic growth, they act to preserve the social fabric and traditional way of life. Concerns about the village structure need to be considered: what about depopulation and an ageing population? Or the fact that small farms are not offered any chances to enter the market? Are these consequences of protected agriculture? Should villagers allow the land to be rented or sold to large associations? These issues are relevant to the sustainable position of Romania in the new context.

Agriculture could be the main resource of Romania's green economy. 45% of the population live at the countryside; it is possible that many could become a burden on the social insurance system, if they are unable to continue to work the land. The Government has to ensure that the entire fertile land becomes useful. This requires good management of land and fresh waters.

The agriculture of natural products should be encouraged. Romania has 62% of its land available for agriculture – the fifth largest surface per capita in Europe. Currently, only 40% is arable and 20% is undeveloped. 95% of the land is private and divided into small fragmented parcels.

The greatest help the government and local authorities can offer to farmers is in the labelling and branding of products. Individual or associations of small farms are greatly assisted if they come into the market with branded organic food. This is not a subsidy and it's not a competitive barrier. In addition, the EU Common Agricultural Policy (CAP) needs to take steps to a more sustainable approach, by gradually reducing the level of subsidies.

EU-ETS, industry policy and energy security

The most important issue for the Government is the Romanian economy's exposure to the price of carbon. It is very likely that this will increase, given the rhythm of growth and

exposure to oil prices, which may be very volatile. Analyses and assessments are urgently required, because of the necessity to move quickly in the new economic context in order to avoid the collapse of industry or generalised inflation.

If the carbon price increases, but not to a level that ensures effectiveness in shifting technology, then the carbon price will become a burden rather than an instrument. So it's very dangerous to leave the necessary economic change to a carbon price that is improbable or uncertain to bring benefits within a short timescale. Romania needs to make a huge transformation in its energy supply system and in retrofitting to become more competitive.

The time available to develop good infrastructure is getting very much reduced. In the medium term, this will become very expensive, and neither the national budget nor the structural funds could cover the difference. Infrastructure has to be developed now. Building highways should not be left until the next development plan, after 2013, because the cost of doing so will exponentially increase and it would be of great help to direct the money elsewhere. The vision has to shift from an energy intensive one to a sustainable perspective. Business that is environmentally friendly will take priority.

The government should ensure energy efficiency in the entire chain of energy supply, from the producer to the consumer. A retrofit approach is required, taking into consideration that 30% of the energy provided from fossil fuel sources can be saved. At the same time, 50% of the energy savings might come from buildings insulation: an extended programme of insulating buildings and certifying energy efficiency is of high interest. This programme should be extended to commercial and institutional buildings.

Given the fact that the energy consumption will increase, Romania needs additional sources of energy. The two very synergistic strategic objectives for the energy security are as follows:

- Ensuring energy autonomy, by developing new national energy capacities. The most ambitious objective would be to increase the hydro capacity to 50% of the primary energy sources, from 25% now, which is equivalent to developing 80% of the national hydro potential. In this manner, the imports of fossil fuels will be hugely reduced.

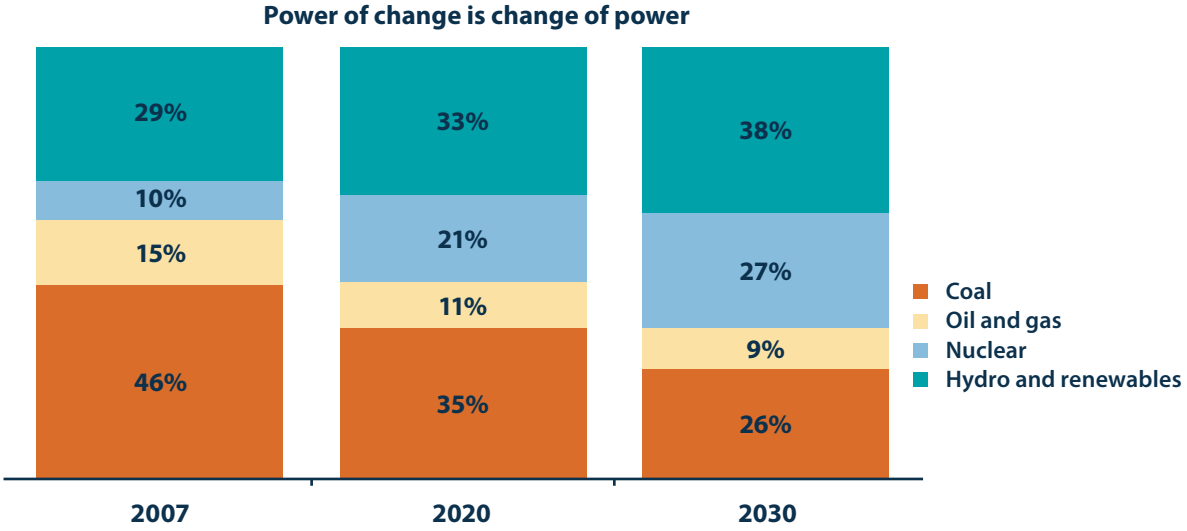
- Decreasing Romania's dependence on fossil fuels. By developing hydro capacities, increasing renewable energy to 50%, and ensuring 30% energy efficiency, we could decrease the fossil fuel dependence from 61% to less than 40%.

If choosing between renewable sources of energy, hydro is the easiest to enhance, and is an investment that we should encourage for the future. Other solutions are very costly, not as productive and would not drive sufficient change to reach the targets. Given the development of cities and the increase in energy demand, the dependence on coal still remains, so other combined heating solutions have to be envisaged. Thermal stations

should be shifted to cogeneration stations, in combination with new technologies that can use coal in the most efficient way.

This mix of policies, partially comprised in the national energy strategy, could produce the necessary changes in the energy supply field to reduce CO_2 emissions.

Sources of energy supply in Romania over the long term



Source: national strategies, author's assessment

Can Romania leapfrog and offer its own model of a low carbon economy within the EU?

This is the question that should concern the stakeholders in Romania. An immediate public debate is required if we want to influence this and to become net producers of wellbeing in the new global economic context rather than consumers at higher prices.

Romania has two economic options: the first is to follow a convergence model. This is an economic growth based model, which relies on competitiveness within the market. Considering that the carbon market will bring an increase in prices that will be reflected in each product produced by carbon-intensive industries, the actual solution will become more costly. But still, our competitive advantage won't be lost because the cost of adaptation and mitigation will affect each developed country.

There is, on the other hand, a second, cheaper solution, which is to adopt a low carbon economy strategy. Instead of paying the price for the carbon, we can choose to reduce the carbon itself. This would give a competitive advantage in the new context of the green economy. The next 2–3 years

gives a window of opportunity for a shift in business model – to move from road transport to more sustainable transport; for water and land management; and for decentralised local renewable energy. These solutions are less costly than their alternatives. To continue road transport in conditions of high carbon prices will result in higher prices for commodities.

Otherwise, Romania has few opportunities to develop in the new economic model. Relying on an automobile industry that is energy- and carbon-intensive is not a sustainable perspective. We have to shift national priorities from carbon-intensive industries to more environmentally friendly business models. The automotive industry has to rapidly adopt low carbon technologies and shift from cars to trains and coaches, in order to maintain competitiveness.

Infrastructure priorities are fast railways and a totally electrified railway network across the country. Building highways and roads should not exceed the actual European budgetary plan and we should concentrate more on ensuring local transport connections. Country roads are more important than the highways in the new perspective.

Buildings should be energy certified and new buildings should be at the highest level of energy efficiency. We must continue to develop utilities in the countryside, mainly water supply, electricity and sewerage. Much more attention should be given to metrology and energy savings. There is huge potential to increase energy efficiency.

Better water management is required, in order to increase fresh water management from 45% to more than 75%. Water supply and mineral water sources are comparative advantages for Romania and we should benefit from them.

Conclusion

A new perspective is coming and a new window opening, one which will make the world look different. The solution is within each individual, it is not a matter of climate change. Climate has always changed. It is only a matter of our response, of positive actions, of questioning ourselves: are we taking the right actions for the world and for nature?

Romania has the capacities and drivers to deliver its own model of change, given the fact that it's still in search of market identity and of market drivers to increase competitiveness. Therefore, we should avoid the mistakes the developed states made, and try to follow a more sustainable route from this very early stage.

Envisaging all of this, it is our duty to take leadership and provide a new model, a model that should better integrate individuals, ecosystems, nation states, companies – in a word – **the planet**.

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Business and Sustainability in Russia:
Conflicting World Views and Challenges for Transformation?

Maria Zhevlakova, Russian Federation

Abstract

The aim of this paper is to consider some of the key challenges in engaging Russian businesses in sustainability actions. The review suggests that despite the recent development in understanding and practice of sustainability globally, Russian companies lag significantly behind, although they do practice some aspects of corporate and social responsibility. This situation can be explained in the context of Russia's key historical, cultural, political and economic challenges, discussed in this paper.

This review stresses the importance of promoting the understanding of the low carbon circular economy, so-called 'strong sustainability'. Assumptions are made about the level of current understanding of sustainability by Russian companies and the key challenges for mainstreaming sustainability in Russia.

A presentation of some conclusions on the key challenges for sustainability in Russia is given. This work is based on the information gathered via desk research and a small-scale survey of opinions. The importance of overcoming those challenges is stressed and the envisaged approaches to engaging business into sustainability actions by OSEKO[1] and its partners are given.

"The public, I believe, knows what we are against but not what we are for. And there are many things that should be stopped, but what should be started? The answer to that question lies in a more coherent agenda formed around what is being called ecological design as it applies to land use, buildings, energy systems, transportation, materials, water, agriculture, forestry, and urban planning." David W. Orr, 2003

This quote from the sustainability thinker and educator David W. Orr helps to emphasise the need for a vision for the future – a future that

[1] OSEKO is an environment education NGO in St Petersburg

would be so attractive for people, that they would bring about change to turn this vision into reality.

The need for reinterpreting our relationship with the natural world and integrating this new view into the economy is recognised globally. Governments and private sector organisations in different countries are looking for the policy instruments, technologies and behavioural change which can underpin such a radical change.

The real reorientation of innovative business practice, in fields as diverse as city planning, agriculture, construction and product design, will require adopting a 'closed loop' (living systems) model.

Way back in 1966, the economist Kenneth Boulding suggested that a "'circular economy' is a long-term aim compatible with economic growth, sustainability and zero waste". Ken Boulding contrasted a linear or 'cowboy' economy (which acts as though the world receives a flow of fresh resources and can dispose of wastes) with a circular, cyclic or 'spaceship' economy (which observes that the world is effectively closed to matter). He noted that the linear economy was – and still is – characterised both by environmental impacts such as pollution and by a wide range of inter-related impacts such as extreme inequalities, materialism, depression, a feeling of alienation and loss of control. His colleague Fred Polak insisted there is a great deal of historical evidence to suggest that, "a society...which loses its positive image of the future loses also its capacity to deal with present problems".

Dr William Rees, the author of the idea of the ecological footprint, noted that we, "have the technology today to enable a 75–80% reduction in energy and (some) material consumption while actually improving quality of life". A low carbon economy is feasible and could give a better quality of life for most but we do not act. It seems that worldwide there are vested interests in the status quo that control policy levers while ordinary people hold to the expansionist myth. Rees also comments: "Society remains in eco-paralysis... The scientifically necessary is politically unfeasible but the politically feasible is scientifically irrelevant."

The suggestion that what we need is a low carbon economy which is sustainable – cyclic – has been around in many forms for the last 50 years. Here is the founder of the Natural Step[2] writing 25 years ago: "Most environmental problems are based on the same systemic error – linear processing of material. Until resources are processed in cycles – either by society or by biogeochemical processes – the global economy and public health will continue to deteriorate. Consequently, we will never be in a better position than we are now to make the necessary changes; every minute we delay increases the final cost."

The people and organisations committed to promoting this view of sustainability face the

[2] http://www.naturalstep.org/

challenge of compromising their beliefs and understanding of strong sustainability and systemic strategic thinking with a need to do urgently what is possible today. Decisions should be taken as to whether we have the luxury of educating and growing the future leaders, who will develop their vision and will ensure a transition towards a low carbon circular economy in the coming years. Or does the urgency of the sustainability and climate change problems force us to focus on the immediate actions for emissions reductions, sometimes even without rethinking strategic change in the business models?

OSEKO and its partners see their role as assisting different groups of society and institutions in Russia and the other Russian-speaking countries to reassess their views and understanding of sustainability. The example of CPSL's work in the UK and other countries demonstrates the tremendous potential of engaging businesses as an important driving force for sustainability and to promote urgent actions to improve the environmental and social aspects of development. A combination of the promotion of a systemic change in the economy and the development of business leadership in mainstreaming environmental sustainability (even if a weak sustainability) into both business CSR programmes and governmental polices might be a good solution.

In order to think through the opportunities of including businesses in OSEKO's target groups, initial research was done to review the pre-existing assumptions about the readiness of Russian businesses to integrate sustainability into their strategies.

The basic assumptions regarding sustainability actions in Russia relied on the practical experiences and observations of the reality in Russia. We assumed that:

- the **level of understanding of sustainability** by companies is very low and the status of mainstream sustainability debate in Russia might be compared with that of EU 20–30 years ago – always bearing in mind the differences in political environments and democracy levels;
- there are political, economic, geographical and cultural **challenges** which don't allow organisations even to start moving to treat sustainability and its environmental dimension as a high priority. These challenges prevent companies from embedding sustainability into their strategies and demonstrating the real performance of environmental improvements, let alone a 'strong sustainability' approach. Some of these challenges are common to other emerging economies, and others might be specific to Russia; and
- the largest Russian companies, which operate in international markets, take the most proactive position in their environmental performance. **These companies are the first to integrate sustainability into their business strategies**. However, sustainability and environmental issues are still not a core part of the culture of these companies and more often are just reflected formally in their CSR reports.

These assumptions were checked with the use of the following methods:

- a review of the corporate and social responsibility and sustainability reports of the big Russian companies known as the most progressive in CSR area;
- analyses of the reviews of the situation with CSR development and businesses' environmental improvements in Russia, undertaken by various authors, including consulting companies (for example, PricewaterhouseCoopers), business associations and environmental NGOs (such as WWF); and
- analyses of the opinions of the people working in Russian businesses or in partnership with them (through questionnaires and interviews).

The information received from all these sources confirms the basic assumptions and proves that there is massive work on all levels still needed to mainstream sustainability issues into business, educational and political thinking and practice.

The challenges discussed below will help us to build hypotheses about different driving forces for sustainability which may or may not work in Russia. These issues should be studied deeper within further research.

Some of the key challenges for business sustainability actions in Russia are described in short below. These challenges were emphasised by the people interviewed and were also presented in the reports and reviews on the issue which were analysed for the purpose of this research.

The key challenges to consider are the:

- misunderstanding and misinterpretation of the key ideas of sustainability;
- size of the country and the dependence of the economy on the extractive industry;
- limits on CSR as an avenue for sustainability work within the different forms of ownership and company size;
- introduction of new thinking and a call for proactive action within the existing business environment;
- lack of governmental regulation and innovative leadership for sustainable development; and
- lack of information and transparency.

Misunderstanding and misinterpretation of the key ideas of sustainability

Despite growing attention given to sustainability and environmental issues globally, in Russian society, they are still marginal and seen as a caprice of environmental NGOs. The groups which advocate environmental improvements – especially when it comes to a discussion about bringing about systemic change – are often seen as opponents of the economic development of the country, which is still hungering for a better life! The only actions which find support among the general public are those aimed at solving specific environmental problems, after they have occurred (such as cleaning polluted sites or

removing waste further from the densely populated areas). This demonstrates a tendency towards a fragmentary approach and lack of systemic thinking in decision-making, short-termism and an unwillingness of the people to discuss the deep roots of the current complex problems. Mainstreaming sustainability in such conditions becomes even more challenging.

It is interesting that in the most of the world the word development still carries negative connotations, whereas the word sustainability may seem less controversial.[3] However in Russia it is the opposite – the term sustainable development in business and policy language is understood primarily as continuous economic development, and the concept of environmental sustainability remains minor and insignificant. There is not sufficient understanding of the interdependence of economic development and natural and human capital.

Sustainable development is a complex concept and it is well worth developing a common understanding about how people and organisations interpret sustainable development.

Size of the country and the dependence of the economy on the extractive industry

Despite the fact that the Russian government declares that a number of environmental issues – such as energy efficiency and water – should be the top priority in the decision-making process, in reality, environmental challenges are still not recognised by the majority of people and organisations, and there are insufficient changes in thinking, lifestyles and businesses.

The size of the country and the abundance of natural resources play, to some extent, a negative role in a movement towards sustainability. Unlike in other countries, which experience the real pressures of a deficit of natural resources and energy supply, people in Russia simply don't see the environmental limits of the 'business as usual' model of economic development. A view that the economy needs to develop before environmental issues can be considered is ingrained deeply in people's world view, including those responsible for environmental improvements.

The huge dependence of the Russian economy on oil and gas exports has led to the underdevelopment of other sectors of economy. There was no need for or interest in technological breakthroughs or radical and innovative change. This problem did not look serious when the sufficiently high oil price guaranteed a stable and plentiful revenue flow for Russia.

However, even before the economic crisis of 2008, the Russian Head of the Ministry of Finance, Alexey Kudrin, tried to draw attention to the need for the development of innovative sectors of the economy and excluding the oil

[3] Association of Russian Managers/UNDP, 'Report on Social Investments in Russia 2004'; http://www.amr.ru/publicdoc_518.html

revenues from the budget, in order to reduce the reliance of the economic development on oil and gas extraction.

Limits on CSR as an avenue for sustainability work within the different forms of ownership and company size

As the corporate and social responsibility sphere is the most obvious area for companies to place their sustainability work, we considered how this is developing in Russia. The CSR-related changes are slow to appear among large and medium-sized state companies and companies with predominantly state control. This is largely due to a general lack of transparency of Russian business. According to research carried out by Standard & Poor's in 2005 and 2006, the level of transparency in Russian government-owned businesses is much lower than in private businesses, though the latter is also not entirely up to global standards.

The most well-known traits of the Russian economy are the high level of monopolies and corruption. This means that the resources are not used efficiently. There is a lack of price signals and competition in certain sectors that could have put pressure on the biggest companies and pushed them towards being more sustainable.

CSR has been progressing in Russia in line with global trends, however as yet very slowly and without covering small and medium-sized businesses. When, in its most developed version, social responsibility is reported openly to the public, it means that company activity has three 'pillars' of responsibility: economic (quality, product and service safety, availability, and affordability); environmental (reduction of harmful emissions and other environmental loads) and social (corporate development and social projects, including charity).

The key drivers for CSR reporting and strategies, as well as for better environmental performance by Russian companies, are foreign ownership, assets located in other countries and a willingness to access the international stock market.

As a rule, Russian small and medium-sized businesses do not go beyond local charity, claiming it as the main form of social responsibility.

SMEs, when considered collectively, are responsible for a significant contribution to the environmental impact of industry, and the health and well-being of society, yet they are less open to scrutiny and monitoring. Furthermore, they have less infrastructure to enable the development of innovative solutions to decrease the environmental impact of production.

The one-company town phenomenon, so common in Soviet economies, adds to the problem. Russia has a prevalence of extremely large-scale enterprises, often located in challenging and isolated geographical locations. This puts even more pressure on the company to provide essentials for the community – everything from drinking water, to heat and lighting, to transportation systems. With such a degree of dependence on one business, any disruption to normal operations,

let alone the withdrawal of key social support mechanisms in the wake of privatisation and restructuring, could spell disaster, not only for the tens of thousands directly employed, but for the entire population of the towns. This lack of diversity in local economies has forced the government to provide support to often environmentally inefficient companies in order to ease social instability.

Again, these factors delay the potential transformation of Russian businesses to being more sustainable, and they still need to focus on survival and provision for the local citizens who don't have other choices in which to make their living.

Introduction of new thinking and a call for proactive action within the existing business environment

The current sustainability thinking suggests that the best way to achieve sustainability for the businesses in emerging economy can be to leapfrog – to develop innovative approaches to resource use, technologies and business models 'from scratch', which the rigid conventional economic system based on the business-as-usual model has not yet built. This mode of development could give a competitive advantage to the country. In comparison with the situation of 20 years ago, there is a better understanding of problems such as climate change risks and resource depletion. Business and the governments all over the world have developed sustainability policies, technologies and business strategies.

However, the last 20 years of economic development in Russia has created a perception of the 'green after gold' approach as being the only way to ensure wellbeing. The desired standards of life were those of the developed countries, although this model of economic development brought wealth only for limited number of people, and poverty, inequity and a worsening state of the environment elsewhere in the world.

So, the challenge of integrating sustainability thinking and practice into Russian business life is now the more difficult task of reassessing development, balancing conflicting world views and searching for added value for business in sustainability strategies.

Lack of governmental regulation and innovative leadership for sustainable development

An important role of governments is to provide the climate for sustainable innovation, the **regulatory frameworks** that reduce uncertainty so that better solutions will succeed in the marketplace. Governments are also expected to reinforce the standards of behaviour that are sought of others, for example within public procurement policies.

According to the opinion of the people who took part in the survey and the analyses of the legislation in Russia, the uncertainty of government policy is one of the barriers to sustainability for Russian businesses. This uncertainty leads to short-termism in planning. The companies seek reliable and quick profits, in order to use the maximum potential of the current situation – the risk of unpredictable change in policies is considered as high.

The regulatory frameworks offer too little (or too much) 'command and control', so the new approaches are uneconomic in the face of established manufacturing capacity. Misplaced incentives such as subsidies and governmental support of polluting companies with inefficient governance structures also remain one of the barriers for sustainability in Russia.

A new law recently introduced by the Russian government has the potential to push private and public sector organisations to enhance their environmental performance, energy efficiency in particular. But even this new policy can't be seen as sufficient for the transition to a more sustainable economy. The measures introduced in the new regulations allow the companies to perceive the interface between the business and the environment as a technical issue, but not a strategic one.

Despite the fact that companies recognise the lack of regulation as a serious obstacle for integrating sustainability into business strategies, one could argue that governmental regulation should be a strong enough driver for sustainability.

The contemporary history of Russia abounds with examples of the creativity and ingenuity of the Russian people and organisations in non-compliance with the law. Most of the new regulations introduced are met with suspicion. More work needs to be done on improving public understanding of why the law has been introduced, what are its benefits, and on developing the sense of ownership by the wider groups of the society. Wider public and business consultations, participatory approaches and better communication in partnership with NGOs might be useful for shifting the perception of the new regulations and ensuring compliance with them.

The role of business leadership for change in Russia is questionable. The very understanding of the concept of leadership as the driving force for dramatic change is not well accepted in Russia. Given the long history of autocracy and a strictly hierarchical society, even potential leaders are expected 'to play the game according to the established rules'. In general, the belief of the Russian people in the capability of strong leaders to bring about change and their interest in improving the situation in the country is very low.

The experience of other countries suggests that leadership in improving business sustainability and in pushing governments to impose environmental regulations often started with the personal concerns and will of individuals. They are the people who use their capacity and influence not only to change their companies' strategies, but also to engage their partners, suppliers, and other business leaders in sustainability debates and practices.

This kind of business leader is still to be grown and found in Russia. Some leaders of private and state-owned companies have their own concerns or priorities which they bring into the agendas of their companies (for example, enhanced environmental responsibility, or, more often, charitable donations and other forms of social responsibility) but without changes to the core operations of the company.

Unlike in some countries such as the UK, the concept that innovative leadership can be the driving force for sustainability is unlikely to work well in Russia. In Russia, business leaders do not see radical new ideas, of which sustainability is one, as positive business attributes which are likely to be respected by colleagues and political decision makers or possibly more importantly, make them money. Though in Russia, political and business relationships are much closer (in practice if not in public) than in the some other countries.

Lack of information and transparency

For companies, the transition to sustainability is a process of strategic organisational change, and the issue of information disclosure and open analysis of the situation in the company becomes crucial. In order to develop innovative solutions for sustainability, organizations have to critically think through the problems, risks and opportunities. This is an essential part of successful governance and management. However, this approach meets some cultural obstacles in Russia, and many western managers notice that some well tried-out managerial approaches don't work in Russia.

Some of these cultural barriers derive from the long history of Russian autocracy, the roots of which are found almost 300 years ago, but still remain a strong feature of behaviour. One of the phenomena to consider is the so-called 'Potemkin village' – meaning the information about the real situation is hidden behind the parade façade. There is a strong custom of not showing the real problems, at its most extreme when people do not tell the truth even to themselves. This creates additional difficulties for policy- and decision-makers on different levels, as the decisions may be based on false information and not related to reality.

However for now, a small group of enthusiastic companies are building their CSR work (which can be considered as a predecessor of sustainability strategy) on their understanding of how this work is strategically important for business sustainability. Their activity in this sphere is also aimed at creating clear, effective and regular relationships with regional and municipal authorities, as well as with civil society. The communication of case studies and examples of best practice of partnerships and effective disclosure will help to develop trust and transparency in society.

The consideration of the challenges above was with the purpose of thinking critically through the obstacles and opportunities for sustainability actions in Russia, with the aim of sustainable development for the country and a hope for the positive change which will be brought about.

There are challenges…but engaging Russian business in sustainability is still important!

Despite the various barriers and challenges for sustainability that exist in the Russian political and economic environment, the transition to a more sustainable economy and mainstreaming the sustainability debate at the national level are very important.

Should Russia adopt sustainability and the transition to a low carbon economy as

one of the national priorities, this will **help Russia to engage on key global issues** – including climate change – and the risks of further marginalisation of the country in the international arena will be reduced. Russia's policies and proposals will be in synch with global thinking and will elicit a productive response.

The Russian economy is one of the most carbon-intensive in the world; this is due to a number of factors, such as high demand for energy due to the cold climate, the dominance of energy-intensive industries, and the low energy efficiency of industry. This could bring negative consequences for Russia in the future, if stricter international carbon and other emissions regulations are imposed. At the same time there are opportunities for significant emission reductions.

The Russian government is on the road to redefining the trajectory of the economic development of the country. It has stated its intention to balance its extraordinary wealth in energy and natural resources with the need to develop a post-industrial economy. Yet the resurgence of the state in the economy is restraining the growth of other new businesses in precisely those knowledge-based industries that Russia will need. The sustainability and eco-efficiency agenda could serve as a positive context for this in alignment with the global movement to environmental sustainability.

Within the post-Copenhagen agreements, Russia submitted to reduction targets of 15–25% to 1990 levels. Despite the fact that there is still space for an increase of GHG emissions up to 2012, a particular challenge is that Russia's carbon intensity per US$ of GDP is one of the highest in the world, and three times higher than that of China or the EU. Taking this into consideration and bearing in mind that Russia needs a significant improvement in its people's quality of life, which requires economic development, the new sustainable path for development is essential.

To achieve the GHG emissions reductions targets and to ensure the transition of the Russian economy to a more sustainable development, the engagement of Russian businesses – both private sector and state-owned – in sustainability is crucial.

Possible approaches to engaging businesses into sustainability actions

There are a lot of organisations with the potential to engage businesses strategically in sustainability work. Among these are the biggest consultancy companies (including the 'big four': Deloitte Touche Tohmatsu, Ernst & Young, KPMG, and PricewaterhouseCoopers), universities and business-training organisations.

Nevertheless, OSEKO's capacity in developing unique interactive teaching programmes and engagement projects with a deep understanding of sustainability issues gives us hope that it would be possible to broaden the organisation's target groups to include businesses.

Despite the lack of understanding of sustainability issues by Russian businesses,

there is no clear demand for sustainability education. This makes us look for opportunities to engage businesses in sustainability actions indirectly at first, and further research is needed. Possible approaches could involve engaging with interested individuals and with organisations which have the institutional capability to interest businesses.

The envisaged actions to be included into a short-term plan are as follows:

- Undertaking a study in order to better understand the motivation and needs of businesses.
- Including sustainability components into the content of the intermediaries meetings and events. OSEKO has networking connections with intermediaries such as the Chamber of Commerce, Union of Industries and Entrepreneurs, and others. The first actions would have to be strengthening the relationships with those organisations.
- Using the sample case of OSEKO's work done with St Petersburg Water Company to serve as a success story. Similar projects of engaging other companies into public communication on sustainability and resource efficiency issues can work as a starting point to bringing sustainability into the companies' own agendas.
- Promoting international cooperation and access to innovations as attractive resources for Russian organisations. Joint seminars/round tables in partnership with CPSL can help to build a high profile and credibility for business sustainability education.
- Finding champions of sustainability and bringing them into the discussion can be a powerful resource, despite the uncertainty of the sustainability leadership role in Russia.
- Starting a discussion on compliance and long-term efficiency strategies, while attracting the attention of businesses to sustainability (for example with reference to the new energy efficiency law).

Conclusion

Despite the challenges for sustainability actions in Russia it is essential for Russian businesses to catch up with the global trend and move to sustainability. This includes opportunities for both development and supporting international competitiveness of Russian businesses.

Education plays a significant role in bringing about a change in understanding and promoting the idea of transition to the low carbon circular economy.

In order to define the key strategies and approaches to engaging businesses into sustainability actions, deeper research is needed to clarify the opportunities for aligning the needs of the companies with the need for a transition to sustainability.

OSEKO as a sustainability education NGO will develop partnerships with business intermediaries and build its profile based

on the successes of work with individual companies. This work will be communicated to the public in partnership with the companies.

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LATIN AMERICA & CARIBBEAN

Thanks to Climate Change: Mexico´s Policies Towards Low Carbon Growth

Marisol Rivera Planter, Mexico

Climate change poses a growing threat for Mexico. While the impact of climate change was expected to be felt only over the longer term, there is an increasing body of evidence to show that climate change impacts are already occurring. Mexico faces high risks from climate change with respect to water availability, high rates of deforestation, biodiversity loss, impacts on human health, the increased frequency and intensity of tropical storms, natural disasters and potential floods from two ocean coastlines.

Mexico is responsible for 1.5% of the world's greenhouse gas emissions and is the second largest emitter in Latin America after Brazil. The latest official data on greenhouse gas emissions, from 2006, indicate that Mexico releases 709MtCO_2 into the atmosphere per year: 61% from energy generation and consumption, 14% from waste and 10% from deforestation.

As one of the 20 world´s major economies, this year Mexico will be hosting the most important climate change event: COP16 in Cancun. These conferences always create high expectations due to the negotiations involved; they are also an opportunity for the host country to highlight its climate change actions, policies and initiatives, and take the lead on certain issues.

Following a brief description of Mexico's national and international climate change policies, examples of these issues are discussed below.

Overview of Mexico´s climate change policy

Mexico has been very active in international climate change discussions. In 1992, Mexico adopted the UNFCCC, then ratified (1993) and implemented (1994) the Convention and signed and ratified the Kyoto Protocol. As a Non-Annex 1 (developing) country, Mexico is not mandated to limit or reduce its GHG emissions under the Kyoto Protocol, but the country has pledged to reduce its GHG emissions on a voluntary basis.

Mexico has submitted four National Communications to the UNFCCC. The first (1997) established the National GHG Inventory and reported the first studies on Mexico's vulnerability to climate change; the second (2001) updated the National Inventory for the period 1994–1998 and included future emission scenarios; the third (2006) updated the Inventory as of 2002 and included land-use change emissions as well as a number of mitigation and adaptation studies. The fourth (2009), launched just before Copenhagen, updated the Inventory as of 2006, and included adaptation and mitigation climate change measures, future emission scenarios to 2050 and 2070, and projects under the CDM

and local government adaptation plans.

As a further contribution to the global mitigation effort, Mexico has recently released its National Strategy on Climate Change (2007), which acknowledges the importance of urgent and concerted action on climate change mitigation and adaptation. The Strategy emphasises Mexico's willingness to engage in a more ambitious climate change framework than that established by the Kyoto Protocol, and its willingness to adopt long-term targets of a non-binding nature. Mexican Government representatives have frequently stated their opinion that developed countries should make deeper commitments while major developing countries, such as Mexico, should progressively increase their participation in the climate regime.

One of the major objectives of the strategy is to decouple the increase in emissions from economic growth. The two sectors targeted for mitigation effort are energy and land-use change and forestry. In terms of energy generation and use, Mexico intends not only to reduce emissions, but also to provide a "cleaner, more sustainable, efficient, and competitive energy strategy". Mexico's strategy has not only identified and quantified the mitigation potential in all relevant sectors, it has also identified specific measures to take advantage of the corresponding opportunities within a specific timeframe.

In August 2009, the Government of Mexico published the Special Programme on Climate Change (PECC) which details the policy measures required to implement the National Strategy on Climate Change. This programme draws on a solid analytical basis and is an ambitious plan to set Mexico on a low carbon growth path with a reduction in GHG emissions of more than 50% by 2030 compared to 2000 levels. The PECC specifies short-term mitigation actions by sector, to be implemented by 2012. The most noteworthy of these is the development of a cap-and-trade system for the Government-owned oil and gas and electricity monopolies.

Thus, rather than waiting for a post-2012 climate regime to be negotiated at the international level, Mexico is taking the unilateral initiative of making a concrete and early contribution to global mitigation efforts. Understandably, the objectives for the post-2012 time period are more uncertain and depend upon the financial assistance and technology transfer provisions of the post-2012 international agreement; however, the Government has recently decided to pursue the goal of reducing Mexico's GHG emissions by 30% from business-as-usual (BAU) levels by 2020.

A series of recent in-depth assessments have identified a set of the most attractive mitigation measures based on their cost, mitigation potential and auxiliary social and environmental benefits, as well as the regulatory and institutional barriers to their implementation. The National Institute of Ecology recently reviewed the assumptions of the mitigation options for low carbon growth for Mexico, in order to determine the mitigation potential of Mexico by 2020 and the feasibility of achieving the commitments.

Levels of mitigation commitments

Commitment scope	Abatement potential on 2020 $MtCO_2$-eq	% of BAU	Incremental capital expenditure (CAPEX) 2010–2020, in billions of euros
Domestic efforts and resources	111	13%	27.8
Only if soft loans and/ or international funds or grants available	103	12%	8.5
Only if international funds or grants available	47	5%	51.7
Total	261	30%	88

Source: INE (National Institute of Ecology, Mexico) 2009, PECC Analysis, Research and Special Progammes Coordination

The figure above shows three types of commitments that Mexico could achieve depending on the financial resources available. The first row shows actions or projects that should be implemented in the short term using only domestic financial resources for mitigation (lighting, cogeneration, control on imported vehicles, vehicle efficiency among others) and adaptation. This would involve policy reforms in the energy sector, and fiscal reforms in decoupling or removing energy and agriculture subsidies, all of which could be implemented before 2012. The Mexican Government has been considering these reforms for the last decade; if they are implemented as a result of climate change arguments, it will be of great benefit for the country, and will have a double benefit for the Mexican economy.

The second row are the options (REDD, forest management, a shift from oil to gas among others) that will need loans and international funds for technology transfer and for transition and compensation policies. The Green Fund, suggested by the Mexican Government, will be a good mechanism to implement some of the mitigation and adaptation options.

The last row shows commitments (carbon capture and storage – CCS, vehicle efficiency, public transport among others) that are restricted by the availability of international funds.

Challenges for Mexico

COP15 in Copenhagen revealed the inefficiency of the negotiation process within the UN process. The Copenhagen Accord has no binding quantitative commitments to reduce emissions. However, this does not mean that COP15 was a failure: the developed countries committed to reducing emissions by 2020, with monitoring, verification and international reporting. Of most significance is the commitment that developing countries pledge to mitigate emissions, and that the Accord recognises the crucial role of deforestation in the emissions of greenhouse gases, and proposes a system of incentives and financing for tropical countries (including Mexico).

REDD represents nearly one-fifth of the total emissions of greenhouse gases in the world. Mexico will have to commit aggressively to abate deforestation over the next decade. Once again thanks to climate change, Mexico will make policy reforms that it has needed for decades. Once the implementation of REDD is a part of Mexico's commitments to the post-2012 Kyoto Protocol regime, it will represent a radical transformation in domestic policies for forestry and agriculture. Mexico should take the lead to push the adoption of REDD in COP16.

Another challenge for Mexico is to follow the Framework for Strong, Sustainable, and Balanced Growth that the G20 nations proposed in the Pittsburgh Summit (September 2009). Components include enhancing energy efficiency, promoting energy security and fighting climate change. Inefficient fossil fuel subsidies encourage wasteful consumption, distort markets, impede investment in clean energy sources and undermine the efforts to deal with climate change. The G20 is promoting the phase-out of such subsidies, and Mexico – as the leader of one of the world´s major economies – would support this proposal. Mexico needs energy and fiscal reforms both to reduce emissions and for a healthy economy.

It is not only the G20 that is taking Mexico towards a low carbon growth. Within the USA there is ongoing debate about legislation that would result in a complete change of direction in its climate change policy: total limits on its emissions of greenhouse gases would be imposed, assigning goals and responsibilities across all sectors of its economy. The initiatives being discussed include, as the main regulatory mechanism, an economy-wide obligatory cap-and-trade system. The instruments likely to be included as complements to the cap-and-trade system comprise: renewable energy standards; offset markets for regulated entities; and programmes to reduce deforestation in developing countries. These would have clear links to the market-based cap-and-trade mechanism, enhancing its effect and reducing its costs to the economy.

Recognising the benefits from economic and environmental cooperation, the Mexican government is exploring the options to create links between the US carbon markets and its own domestic economic sectors. Additional links could be made with the Canadian carbon market if similar legislation is implemented

in our second NAFTA partner. Given the substantial economic linkage between the three economies, and Mexico's sizable emissions reductions potential, such gains would be significant, making the region more competitive as a whole.

Finally, COP16 will give Mexico the best opportunity to take the lead in proposing and implementing a new approach to reach a global agreement in specific areas: mitigation, adaptation, REDD, technology and financing. It is also the best chance to actively include important domestic participants in the climate change arena, for example the Ministry of Finance, Congress, the private sector and Mexican society.

Thanks to climate change, Mexico will make policy reforms to begin the journey towards a low carbon future.

Avoided Deforestation, Capacity Building and Forest Finance in Guyana: Finding a Niche to Influence Policy

Dr Paulette Bynoe, Guyana

Introduction

Climate change is a major global threat[1] that has implications across both time and geography; as such, every region and country must act now to avert widespread disaster, and to safeguard current and future generations. The global response requires multiple approaches by regions and countries, depending mostly on their natural capital endowment and their social, economic, political, cultural and technological circumstances, and most importantly, political will and good leadership.

This essay positions Guyana's Avoided Deforestation Policy in a wider context of climate change mitigation through forest conservation and access to private finance to complement international grants and public sector funding. It examines the challenge of financing standing forest and explores opportunities through means of Payment for Ecosystem Services (PES). What follows should only be interpreted as a paper on intent, since the author will seek to conduct robust research on the main issues of discussion.

Setting the context: climate change and the forest debate

Undoubtedly, combating deforestation and continuous sustainable forest management are critical mitigation strategies to limit the temperature increase on Earth to below 2°C.[2] In fact, it is believed that forest protection measures are less costly than many other emissions reductions;[3] hence the importance of the UNFCCC Bali Action Plan. This unequivocally supports policy approaches and positive incentives relating to reduced carbon emissions from deforestation and forest degradation (REDD) in developing countries, and the conservation and sustainable management and enhancement of forest carbon stocks (REDD-plus).

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[1] Global temperatures have risen by 0.7°C over the last century. The economic costs of climate change impacts have been estimated at between 5 and 20% of global GDP and could be considerably higher. See Eliasch, J., *Climate change: financing global forests: the Eliasch review*, 2008.

[2] Lindhjem, H., Bråten, K.G., Gleinsvik, A. and Aronsen, I., 'Experiences with benefit sharing: Issues and options for REDD-plus', IUCN report, 2009

[3] See McKinsey Abatement Cost Curves, http://www.mckinsey.com/clientservice/ccsi/Costcurves.asp

Despite the crucial role of forests in tackling the global climate change problem,[4] there is currently no international legal framework to monetise forest carbon.[5] It can be argued, however, that deforestation occurs mainly because of market failures (absence of a system to incentivise terrestrial carbon mitigation either by reducing the rate of deforestation or not starting it in the first place),[6] and that forest nations should be adequately compensated for foregoing alternative economic opportunities[7] associated with the exploitation of their natural capital in pursuit of national development agendas.

REDD-plus requires significant financing (US$17–33 billion per year for reductions in emissions of up to 50% by 2030 according to Eliasch, 2008), but to-date, opportunities for attracting financial flows to forest conservation (to ensure that forests are worth more alive than dead) are limited. This problem is exacerbated when, despite the fact that forests offer much more than carbon storage and sequestration,[8] it is widely believed that the best chance of early action internationally on REDD-plus will come from finding ways to fit forest carbon into the existing carbon market.[9] Judging from the European Union's position and the myriad of concerns (for example, linking performance to finance, and forest carbon trading interactions with other mechanisms) expressed about the possibility of such a policy decision,[10] there seems to be an urgent need to explore a variety of financial structures to fund REDD-plus activities that are not wholly based on carbon. In my opinion, Payment for Ecosystem Services (PES) can be explored to fill the gap in finance (this idea will be developed in the latter part of this essay). Such an approach is useful to the advancement of Guyana's Avoided Deforestation Policy that is discussed in the next section.

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[4] Reducing tropical deforestation will be vital if the world is to avoid catastrophic climate change and preserve important ecological functions. Emissions from tropical deforestation contribute about 17% of annual GHG emissions; conserving rainforests sequesters similar amounts of atmospheric carbon each year. See 'An Emergency Package for Tropical Forests', The Prince's Rainforests Project, 2009.

[5] Forestry transactions were the first-ever carbon offsets; they were soon sidelined in emerging global GHG regulations and a narrow band of forestry offsets were recognised under the Kyoto Protocol. (See www.forest-trends.org.)

[6] See Wright, M., 'Forest Futures', in Green Futures, 26 October 2009, pp.26–29; http://www.forumforthefuture.org/greenfutures/articles/Fore%24t_Future%24

[7] The Prince's Rainforest Project notes that global surveys estimate the opportunity costs of halving deforestation at US$10–15 billion per year.

[8] For example, forests are a key regulator of the climate, provider of biodiversity and source of livelihoods for local people.

[9] Carbon markets could provide as much as $7 billion finance by 2020 (see Eliasch, J., *Climate change: financing global forests: the Eliasch review,* 2008).

[10] See Jodie, K. J., MacGregor, J., Page, S., Peskett, L. and Thorstensen, V., 'Development, trade and carbon reduction: designing coexistence to promote development', Working Paper 315, Overseas Development Institute, London, 2010

Guyana's low carbon response to climate change and the issue of financing standing forests

Guyana, a relatively small developing country, is located on the north-eastern coastline of the South American continent with a land area of approximately 215,000km^2 and a population of about 765,000 (2008 World Bank estimate). One of Guyana's most valued natural assets is its forest; Guyana has forest cover of roughly 85%, containing over 5GtCO_2 in above-ground biomass, with an estimated forest land of 18,416–18,695 million hectares, approximately 12% of which is designated as protected areas.

Guyana's President, His Excellency Bharrat Jagdeo, has demonstrated leadership and political commitment by promising to deploy the country's forests to tackle global warming in exchange for, "development aid" and, "technical assistance needed to make the change to a green economy".[11] Thus, Guyana has charted an 'economically rational' deforestation path that involves reducing forest cover by approximately 4.3% (approximately 630,000 ha) per annum over the course of 25 years, leaving intact as protected areas the 10% of Guyana's forests with the highest conservation value.

Notably, Guyana's REDD-plus mechanism is linked to a wider national development policy and planning process, which is encapsulated in Guyana's Low Carbon Development Strategy (LCDS), 2009.[12] The McKinsey & Company analysis (Office of the President, 2008) argues that avoided deforestation in Guyana could avert emissions of greenhouse gases of the equivalent of 1.5GtCO_2-eq by 2020. The challenge therefore is to access the level of financing for REDD-plus that will align Guyana's economy along a low carbon trajectory (outlined in the LCDS), and in so doing, mitigate the principal drivers[13] of deforestation[14] that lie outside the forest sector.

According to the McKinsey estimates, by preserving forest, "Guyana forgoes economically rational opportunities that could net it the equivalent of US$430 million to $2.3 billion in additional value per year". In fact, McKinsey estimates a, "most likely figure" of US$580 million per year. The proposal is therefore to raise this amount of money through a carbon market. Unfortunately, the Copenhagen Accord of December 2009 is less definitive than desired about the emergence of this REDD financial mechanism. To compound the issue of financing, the infrastructure to implement the Copenhagen

[11] President Jagdeo's interview with *The Independent*, November 2009

[12] The LCDS provides insights on how to stimulate the creation of a low-deforestation, low carbon, climate-resilient economy, and outlines how Guyana's forest helps the world (by limiting world-based emissions), and how transitional payments from Guyana's climate change partnership with Norway and others, followed in the longer term by payments under REDD can create the platform for an effective strategy to avoid deforestation.

[13] Key drivers include commercial logging and timber extraction, mining, agriculture and infrastructure development.

[14] 0.3% as current proxy deforestation rate. The reference level is 0.45% derived from a global deforestation rate compared to a national deforestation rate.

Green Climate Fund facility, equalling US$10 billion per year from 2010–2012,[15] is not fully established and therefore not currently able to be implemented. More importantly, there are still debates on terrestrial carbon markets and issues of additionality, leakage, and permanence.[16]

Guyana's best policy decision is therefore to explore all financial possibilities (especially non-market sources referred to as novel instruments) to channel payments into the country through a combination of a national REDD fund (for example, by establishing a Guyana REDD-plus Investment Fund) and direct project-based funding. Already, a national level initiative is being supported by the Government of Norway. In a recently signed Memorandum of Understanding (MoU) between the two governments, Norway has pledged financial support of US$30 million to be paid by 2010 to support the Guyana REDD-plus Investment Fund (GRIF)and US$250 million to be paid by 2015 based on certain conditions being met by Guyana. Obviously, there still remains a huge financing gap in terms of international, multilateral or bilateral financial support and the stated economic value of Guyana's forest to the nation (EVN).

Defining a niche to influence national policy

As an educationalist and researcher at the University of Guyana, I perceive my role to be two-fold since the success of Guyana's REDD-plus policy and LCDS is contingent on, inter alia, the current and future national human technical capability[17], and reliable information (through applied research) to inform the choice of initiatives. Thus, within one year of my return to the University of Guyana, I will develop and introduce a third-year course on climate change. This course (the first of its kind in Guyana) will be modular and will focus on the following: the science of climate change; climate change and energy security; climate change, forest and food security; the economics of climate change; climate change and gender; climate change – an international perspective; and climate change and stakeholder engagement.

The objectives of the course are: to create and enhance understanding of climate change as a complex global issue; to create and enhance knowledge of the science of climate change; to create an in-depth understanding of the various aspects of climate change; and to promote critical thinking in finding solutions.

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[15] See UN, FCCC/AWGLCA/2009/L.7/Add.2/Rev.1, http://unfccc.int/resource/docs/2009/awglca8/eng/l07a02r01.pdf. See also, Articles 6, 8 and 10 of the Copenhagen Accord

[16] See, for example, Eliasch, J., *Climate change: financing global forests: the Eliasch review*, 2008, and Bond et al. 2009. 'Incentives to sustain forest ecosystem services: A review and lessons for REDD'. *Natural Resource Issues* No. 16. International Institute for Environment and Development, London, UK, with CIFOR, Bogor, Indonesia, and World Resources Institute, Washington D.C., USA.

[17] Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. See Chapter 36 of the United Nations' Agenda 21 on Education, Public Awareness and Training.

Target beneficiaries of the course will be environmental science students (compulsory); students from other faculties (law, engineering, agriculture and forestry, management, international relations); and professionals.[18] I will be the Course Organiser and a member of a multi-disciplinary team (from the School of Earth and Environmental Sciences) who will deliver the course over a period of 15 weeks (1 semester).

My longer term contribution relates to an interdisciplinary research project. The primary purpose of the research is to explore opportunities for private sector payments/ investments in ecosystem services to bridge the gaps in financing Guyana's REDD-plus initiatives, as part of the national policy framework of the LCDS. Such a purpose allows for the articulation of three research questions. For the purpose of this essay, the author seeks to clarify each research question by identifying the key issues to be examined.

Research Question 1
What are the existing opportunities (type of investment and structure of funding mechanisms)[19] for private sector payments for ecosystem services (PES[20], specifically carbon[21] and biodiversity)[22] of standing forests? Opportunities to be investigated include: voluntary carbon offsets; concessions for certified products, timber and non-timber forest products (NTFPs); biodiversity offsets; bio-prospecting rights; and ecotourism. Details of these forms of PES are presented in the table on page 91.

Research Question 2
What is Guyana's current and future capability to attract private sector PES to bridge the gaps in its REDD-plus submissions? Addressing this question will require a thorough investigation into the following areas:

- scientific issues, most particularly the ecosystem services (ES) provided by the

[18] The course will be of one week's duration for professionals.

[19] For example, co-investment.

[20] Ecosystem services are the benefits that people obtain from the dynamic interactions that occur within functioning ecosystems, between plant, animal, and micro-organism communities and the non-living environment. "PES is a *voluntary transaction* for a *well-defined environmental service* (or a land use likely to secure that service), purchased by *at least one environmental service buyer* from *at least one environmental service provider,* if and only if the environmental service provider *meets the conditions of the contract* and secures the environmental service provision." Source: 'Innovative socio-economic policy for improving environmental performance: Payments for ecosystem services', United Nations, 2009.

[21] To-date, the most promising of these ES is still carbon sequestration and storage, given the ease of measurement using a standard unit (tCO_2-eq, unlike biodiversity). Markets for non-carbon environmental services are negligible in relation to the still nascent carbon markets. See for instance, Pagiola, S., Bishop, J. and Landell-Mills, N., *Selling forest environmental services*, Earthscan, 2001.

[22] Conservation of diversity, especially forest habitats, helps maintain forest carbon stocks.

existing forests and the quality of the soil/ water availability which will determine their future growth and resilience;

- legal issues around land rights;
- institutional issues,[23] particularly the framework to allow for private sector payments;
- current state of the market and identification of existing buyers;
- existing economic issues such as currency risks; and
- perceived and actual political risks.[24]

Research Question 3

What is the enabling environment[25] that is required in Guyana to capitalise on possible private-sector investment opportunities for PES? In other words, there is a need to examine ways in which Guyana can create effective demand and willingness to pay. Issues to be researched include: a model of national forest governance framework to increase the attractiveness of investment in REDD-plus activities; improving the investment climate through tax reforms, currency stability and adequate bank and finance facilities; support from the public sector in areas of capacity building and risk-sharing;[26] harmonisation and consolidation of sectoral policies (particularly mining, forestry, land use, and indigenous people); capacity building using up-front payments provided by the Government of Norway and the World Bank Forest Carbon Partnership Facility); provision of alternative livelihoods for forest-dependent communities; an appropriate financing architecture and the issue transfer of funds in terms of transparency and accountability; public awareness and perception of integration of PES into Guyana's development plan; public advocacy and support; measures to avoid sectoral leakage; and economies of scale to ensure private-sector involvement is economically rational, in addition to altruistic private individuals and companies.

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[23] A crucial issue is the overall national and forest governance framework. Under conditions of weak governance it is very difficult for payments for ecosystem services to be effective (Erik Solheim, Minister of the Environment and International Development, Government of Norway, cited in IIED Publication, 2009).

[24] The private sector in Guyana is very risk averse, small and not fully developed. Large incentives must be given for risk taking.

[25] Refers to factors related to governance, transparency, accountability, elimination of illegality and corruption, stable laws and policies and access and reliability of information (Savenije, H., van Dijk, K., Boscolo, M. and Andia, J.Z., 'Financing strategies in national forest programmes: the broader approach', p5; from Background, conceptual framework and lessons from Latin America, World Forestry Congress, 18–23 October 2009, Buenos Aires).

[26] Public funding should therefore be used in the short term to act as a guarantor, effectively bringing down the cost of any liability for the private sector, until the market is large enough to cover these costs. Source: Eliasch, J., *Climate change: financing the global forests: the Eliasch review*, 2008.

Existing opportunities for private sector payments for ecosystem services (PES)

Private sector[27] investment opportunities for REDD[28]-plus (specifically ES[29]: carbon and biodiversity)	Environmental benefits of investment	Market size (US$ per annum)	Case studies	Issues/comments
Pure voluntary conservation schemes[30]	Species and ecosystems conservation	US$8 billion in the USA US$20,000 million in 2020	Birdlife International forest in Indonesia Pure purchase of chunks of the Amazon rainforest through charities Kinangop Grassland Project Government of Guyana and Conservation International agreement Canopy Capital Ltd's acquisition of ES marketing rights from Iwokrama International Centre	No cap-and-trade scheme To be supported strongly by command and control measures Financial flows for philanthropy are targeted at field-level projects, and only in a few cases recipients could be government agencies There are opportunities for conservation schemes on government land Some of these schemes would have been initiated with the aim of generating profits via carbon markets or PES in the long term. Others would have been invested by people with a purely philanthropic focus

Voluntary carbon offsets[31]	Climate change mitigated (measured in tCO_2-eq) Forest (native) area restored and/or protected	US$331 million in 2007; increased three-fold from the 2006 level Estimated at US$500 million–2 billion (per annum) in the market overall in 2020	The Juma Project (Amazonia) supported by The Marriot International Hotel Plan Vivo in Uganda and Malawi Merrill Lynch's acquisition of Aceh Forest in Indonesia and the Ulu Masen project in Sumatra	Issues of permanence, leakage, investment risks and accounting questions have contributed to the reduced demand for forestry projects in voluntary markets There are no established rules and regulations for the voluntary carbon market Voluntary markets are still relatively small and few investors are willing to pay up-front for rights to PES or REDD credits, where markets do not currently exist Tend to be categorised more narrowly than REDD
Concessions for certified forests' products, timber and NTFPs (food, oil products, fibres, rubber, aromatics, medicines, gums and tannins) **Ecolabelling (indirect market)**	Acres of sustainably managed forests Advancing conservation goals	US$5,000 million (Forest Stewardship Council, FSC, only) US$50,000 million by 2020	Rourgier Gabon and Precious Woods Gabon; CIMAL/IMR (a Division of Grupo Roda – a conglomerate of companies based in Santa Cruz), Bolivia. Conservation International's work on Brazil nuts	Market is volatile and highly dynamic

Government-mediated biodiversity PES (for example, conservation concessions)	The environmental benefit potential varies so greatly amongst all the submarkets that it is difficult to conclude whether government biodiversity PES programmes have a standard impact on environmental conservation, land conservation and forest conservation more particularly Hectares of restored or conservation-managed land and protection of specific wildlife habitats; species conserved	US$3 billion US$7 billion in 2020	Mexico Monarch butterfly habitat Brazil ProAmbiente biodiversity payments	Land use rights cannot be traded for financial compensation High transaction costs
Voluntary biodiversity offsets[32]	Species, habitats and ecosystems conserved. (Benefit over time will depend on management and monitoring.)	US$10–17 million US$100 million, if corporations adopt the concept	Shell International; GTL Project, Qatar; Newmont Ghana Gold, Ghana; Solid Energy Coal Mine, New Zealand	Need for legislative frameworks which require developers to create offsets for specific environmental aspects such as wetlands and endangered species Need to secure support of local stakeholders by ensuring offset will bring them net benefits Stakeholder conflict can be exported

Bio-prospecting rights (markets for medicinal products) – two-fold: for prospecting rights and shares in commercial value of new drug **Indirect market**	Royalties usually go into an environmental trust that invests in a mix of habitat conservation, capacity building, education, etc. Areas of high biodiversity	US$15–30 million US$100 million in 2020	1990: contract between Merck and Costa Rica's INBio – payment of approximately US$1 million 1999: US$3.2 million agreement by Glaxo Wellcome to screen 30,000 samples from Brazil's biota	Asymmetric information Information on commercial value can be hidden; intellectual property rights (IPR) issues Unrealistic expectations; substantial business risks Search processes are becoming very selective, favouring particular areas, with known prior information
Ecotourism[33] (indirect market) **Indirect market**	Management and protection of national parks, 'wilderness areas' and wildlife	Ecotourism is the fastest-growing area of the tourism industry. The World Tourism Organisation estimates that global spending on ecotourism is increasing by 20% a year, about six times the industry-wide rate of growth[34]	Costa Rica (approximately 1 million visitors annually and US$1billion revenue a year) African countries have about 7.5% annual growth in ecotourism. Examples are South Africa, Zambia, Zimbabwe and Madagascar	Market is fickle as a result of seasonality. Other market fluctuations related to external shocks (environmental, economic, political) Price of international travel related to price of oil Ecotourism may not necessarily involve forest or biodiversity-rich lands The issue of carbon footprints

Source: TEEB (2009); Forum for the Future (2009)

p90

[27] Private sector includes individuals, corporations, insurance companies, banks, mutual funds and sovereign wealth funds, but excludes government or supranational entities. Private investment may be from domestic sources or international sources. Source: Forum for the Future, *Private Investment Review*, 2009, p.81

[28] Reducing emissions from deforestation and forest degradation (REDD) in developing countries is thus an important component of a viable global climate policy framework, and has captured international attention as a potentially effective and low-cost climate change mitigation option; Intergovernmental Panel on Climate Change (IPCC) (2007a), *Climate Change 2007 – The Physical Science Basis: Contribution of Working Group I to the Fourth Assessment Report of the IPCC*, Cambridge, Cambridge University Press; Stern, N., *The Economics of Climate Change*, *The Stern Review*, Cambridge University Press, 2007

[29] Utility service of standing forests

[30] Conservation concessions are time-bound agreements to conserve a given land area instead of developing or degrading it. The conservation investor will pay the Government for the right to preserve the forest intact. (Rice, 2002, Conservation Concessions – Concept Description. Conservation International, Washington DC.)

p91

[31] Historically, 73% of forestry offsets' transactions occurred in the voluntary carbon markets. The voluntary carbon markets include all carbon offset trades not driven by regulation. These include transactions involving credits created specifically for the voluntary markets (such as Verified Emission Reductions, VERs, or Carbon Financial Instruments) as well as transactions in which suppliers sold regulatory market credits (such as Certified Emission Reductions, CERs) to voluntary buyers. Credits sourced specifically for the over-the-counter (OTC) market are often generically referred to as Verified Emission Reductions (VERs), or simply as carbon offsets.

p92

[32] Conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects, so as to ensure no net loss of biodiversity: Ten, K., Bishop, J. and Bayon, R. *Biodiversity offsets: Views, experience, and the business case,* IUCN and Insight Investment, 2004

p93

[33] Ecotourism is the fastest growing sector of the tourism industry – the world's largest service industry. (Mastny 2001, New Paths for Ecotourism, Worldwatch Institute)

[34] TEEB – The Economics of Ecosystems and Biodiversity for National and International Policy Makers –Summary: Responding to the Value of Nature 2009

Conclusion

The contribution of tropical forests to combating global climate change is undeniable. The willingness to take policy actions such as Avoided Deforestation is a clear demonstration of Guyana's commitment to help save the world from the unequivocal impacts of anthropogenic climate change. In so doing, Guyana cannot turn a blind eye to the need for social and economic development of the nation and the importance of accessing much-needed finance to achieve such an objective. The country, however, cannot wait in hope for the legal establishment of carbon markets, and more importantly, the inclusion of tradable forest carbon. Each passing day brings with it implications for the nation's standing forests. Therefore, it is prudent to explore opportunities for private-sector payments for ecosystem services to help finance the broader national policy framework – the LCDS – which will ensure green growth and the avoidance of sectoral leakage in respect of deforestation. Moreover, Guyana's success at achieving its REDD-plus goals requires the involvement of each citizen of the country. As stated earlier, the time to act is now, and I am committed and ready to fulfil my role as described in this essay.

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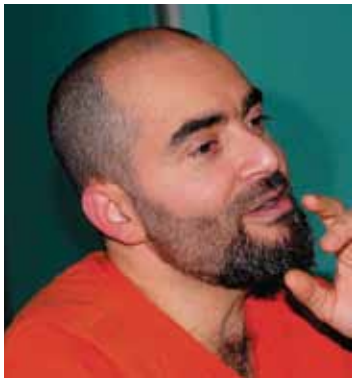
Economic Incentives for Rainforests in Brazil



Aloisio L. P. de Melo, Brazil

Previous advances in reducing deforestation

Reducing deforestation in the Amazon is a central component of the Brazilian National Plan on Climate Change. A comprehensive long-term strategy must be implemented in order to meet the country's voluntary commitment of lowering Brazil's projected CO_2 emissions by 2020. Those efforts will require mobilising public and private funding and should be taken as a central part of the transition to a low carbon economy.

Since 2005, a successful strategy has delivered a consistent decline in annual deforested areas, based on monitoring satellite technology and intensive enforcement. Recent legal and institutional improvements were important and further steps will depend not only on improving existing capacities, but also – and mainly – on designing and delivering new economic instruments directed to reduce pressures on forests and to enable new forest-based and forest-friendly economic activities in the Amazon.

Recent institutional improvements created the conditions for the initial advances. Continuous institutional development will play an important role in sustaining low deforestation rates and creating the conditions for new economic dynamics in the Amazon. Actions needed include: delivering new monitoring systems for forest degradation and selective timber extraction; improving enforcement action for smaller deforested areas; clarifying land tenure rights, including geo-referencing of all rural properties; and enabling wide and easy compliance of farmers to environmental requirements.

The current budget is not enough to meet the timing and the scope required for those actions, as well as for new economic and social incentives. In the short term (2010 and 2011), additional funding should be guaranteed in order to broaden actions. Studies should be made to understand the scale of the needs and search for additional funding, including commitments made in COP15, partnerships with the private sector and bilateral agreements. The financial support for the new institutional framework should be designed by the end of 2010, in order to be included in the next Multiyear Plan (PPA) 2012–15.

The diversity of the drivers of deforestation will require the active engagement and cooperative action of all stakeholders: cattle ranchers, crop farmers, smallholders, traditional communities, processing industry, traders, government agencies (at national and sub-national levels) and civil society organisations. Former experiences in positive interaction

should be built on. The main challenge to sustain low deforestation rates, however, will be to deliver economic incentives for maintaining, recovering and enhancing natural forests in the Amazon.

Financing the transition

Conceptual advances related to forests and REDD-plus[1] were achieved in Copenhagen, in terms of recognising the role of reducing deforestation and forest degradation, as well as the need to enhance the role of forests in greenhouse gas removal. The Accord also stresses the recognition of the need to provide positive incentives through the establishment of a mechanism (including REDD-plus) to enable the mobilisation of financial resources from developed countries. Further steps in clarifying the mechanisms and institutional framework are expected in 2010, through a set of preparatory meetings to COP16.

However important the conceptual recognition is of both the role of forests and the commitment of developed countries, the timing and conditions for financial support for REDD-plus remain unclear. The financial crisis resulted in increasing pressures to reduce debt in developed countries, which are under pressure to prioritise domestic expenditure and investments. In addition, the EU intends to maintain the position of not integrating forestry, land use and land-use change in carbon markets until 2020, arguing that technical issues remain unsolved.

It must be recognised that a REDD-plus mechanism based on voluntary public resources would not achieve the scale required in Brazil, neither would it guarantee long-term cash flows. Hence, it will be necessary to build strategies for mobilising private resources from the early stages of the implementation of a national REDD-plus mechanism.

A decisive aspect for mobilising private resources is whether REDD-plus will be linked to carbon markets. Private investments could be mobilised in a scenario in which carbon credits based on avoided deforestation or maintaining forests would be linked in future to carbon markets. Projects directed at creating new reserves or to reward local communities for protecting forests, for instance, could become attractive activities to the private sector, due to the future returns to be provided by carbon markets.

On the other hand, it is likely that restrictions to land-use activities in the Clean Development Mechanism (CDM) in the European Trading Scheme (ETS) will remain, at least until 2020, indicating that forest-based carbon credits will not be fungible with carbon markets in the short term. In that scenario, private investment would probably be driven to the set of forest-based activities which generated direct financial return – basically, products such as timber (round and sawn hardwood), wood for paper, pulp and panel

[1] REDD-plus includes: reduction of emissions from deforestation and forest degradation; conservation of existing forest carbon stocks; and enhancing stocks through aforestation and reforestation.

industries and coal for iron and steel industries. Investments could also be feasible in the expanding palm oil industry and, in some cases, in non-timber products, tourism or bio-prospection.

An intermediate situation would be a sectoral carbon market in which REDD-plus carbon credits would not be fungible to general carbon markets, but subject to specific allocations by governments (taking note of limits for offsets, such as those applied in the CDM).

Short-term action: delivering incentives to smallholders and traditional communities

Despite those uncertainties, special attention must be given in the short term to smallholders and traditional communities in areas under pressure for timber extraction or cattle and agriculture expansion, focusing on the municipalities with higher deforestation rates. The main tool should be a direct payment (grant) programme, based on land tenure clearance, environmental registers, individual and communitarian contracts, technical assistance and intensive monitoring. The legal basis and detailed regulation will be required in order to define values for the payments, with regard to parameters such as opportunity costs, costs for recovering areas to achieve environmental compliances and revenues for locally accepted livelihood standards.

The Amazon Fund and predicted additional resources that were agreed in COP15 will play an important role. Even though it will not be able to support national or regional policies, due to the limited amount and voluntary nature of resources, the Fund can contribute to consolidating monitoring methodologies and to develop internationally accepted registers of reducing deforestation and forest degradation and enhancing carbon stocks. Mechanisms for REDD-plus on a project-based approach can also be developed under the Amazon Fund, enabling important learning from those projects. NGOs, local organisations and research institutions will be important stakeholders in dialogues for designing the national policy.

Additional regulatory and institutional improvements will also be required in order to develop and implement a national REDD-plus mechanism compatible with international standards. Special attention should be given to registration systems for carbon credits from avoided deforestation and land use.

Reducing pressures on forests

One of the main challenges for national action in the absence of a potent REDD-plus mechanism linked to carbon markets will be how to use national public funds in the most effective way in order to catalyse private sector investments into economic activities compatible with the protection and sustainable management of the Amazon forest.

Cattle ranching and grain production are indicated as being direct or indirect sources of pressures over the Amazon forest. Besides the traditional command and control approach, efforts should be made to promote the

strategic view of sustainability and a low carbon footprint as a matter of competitiveness in the long term for those products and the industry associated with them.

An important tool is finance, either in terms of avoiding financial support to unsustainable farming or in delivering concessional loans for forest-friendly activities. For the former, the main measure should be reviewing the regulations for rural credit, in order to include other regions (besides the Amazon) and an agro-industrial credit line. Environmental requirements should also be included in price-support policies.

Technological improvements should be promoted in cattle and crop production in the Amazon, in order to stabilise higher yields and to reduce pressures for spatial expansion. Information, technical assistance and economic incentives will be necessary to enable the adoption of new technologies, such as the recovery of old pasture lands, cattle-crop-forestry integration, direct planting and biological nitrogen fixation. Existing rural credit programmes for those activities have had a low demand in recent years, indicating that a review should be made of their conditions. Long-term loans with low interest rates could be complemented with low-cost insurance. New specific incentives, such as discounts in debts when technical and environmental standards are met, must be analysed, as we face restrictions in funding and previous experiences have shown low effectiveness of similar instruments.

More effective would be differentiated markets and prices for sustainable beef, soyabeans and other products such as timber, to enable the wider adoption of more suitable production and new technology standards. Awareness about the carbon footprint of tropical products and their impacts on forests is increasing among consumers, traders and other stakeholders along supply chains. In addition, recent discussions on carbon taxes[2] indicate that environmental concerns will probably have an increasing role in trade.

It is highly recommended that the Brazilian Government agencies strengthen existing dialogues between stakeholders of supply chains (farmers, mills, slaughterhouses, banks, trade companies, technical assistance services) in order to design strategies to drive a transition to a lower carbon footprint of agribusiness exports. Also important will be to support the development and broadening of private sector voluntary agreements, such as the Beef and the Soyabean Moratoria. Additional measures could include the definition of voluntary technical standards and, later, the incorporation of those measures in credit and price policies. Another measure could be the development and deployment of

[2] Examples are the prospect of carbon taxes in the US, as proposed in the American Clean Energy and Security Act (also known as the Waxman-Markey bill); announcements by the French Government about a carbon tax; and studies going ongoing by the Carbon Trust (UK) about carbon taxes on consumption.

tracking technologies for voluntary adoption. Specific studies should be made in order to assess the impacts of compulsory traceability in specific supply chains.

Potential for private investments in forests

Most forest-based products and activities are in the early stages, and have both high risks and long-term returns. Because of this, a review of rural credit policy and other existing instruments, as well as the development of new strategies for public intervention, will be required to support private sector investment in forests.

The forestry sector in Brazil raised US$37 billion in 2007, representing 3.5% of GDP and employing 568,460 people. Exports in 2009 amounted to US$7 billion, mainly based on wood cellulose, paper, sawed wood and panels.[3] One of the objectives of the National Plan on Climate Change is to increase forestry from 6.6 to 11 million hectares in 2020. In order to arrive at a more detailed design of new investment funds, concessional loans, insurance and other instruments, dialogues should be promoted with the forestry industry, financial market, banks and farmers.

Initial efforts of Government agencies should focus investment in concessions for timber extraction in public protected areas, launched in 2007. Companies operating the first concessions have a demand for investment and face low risks compared to other activities, due to long-term contracts and clear legal and institutional frameworks. Remaining market risks of this activity could be lowered through the adoption of tracking and certification systems, as well as long-term contracts with industry and traders.

A set of new actions will be necessary in order to remove barriers and uncertainties for forest-based economic activities and to enable the leverage of private investments:

- Besides clearance of land tenures rights (as referred earlier), additional efforts should be made to broaden and speed up the environmental compliance of farmers.
- Although there has been a first review in environmental regulation, it is not clear which economic activities can be developed in private legal reserves within farmlands. Heavy fines inhibit economic management of those forests. Additional uncertainties arise from decentralisation of registers and enforcement to state environment agencies, which can adopt different approaches and requirements. Additional regulation is required to clarify which economic activities can be developed in those areas.
- In addition, simpler and faster processes of submission and approval of forest management plans would enable over 300,000 farmers to profit from the sustainable use of natural forests. Similar procedures would enable additional revenues to go to 200,000 people from traditional communities

[3] Serviço Florestal Brasileiro (SFB), Ministério do Meio Ambiente, 'Florestas do Brasil em Resumo – 2009', 2010

living in sustainable management protection units, covering 123.6 million hectares, as well as to indigenous groups living in another 105.6 million hectares. Technical assistance, training and technological tools must also be improved.

Action should also be taken in order to leverage private investments in forest-based activities. Special attention should be given to develop a strategy for lowering risks for innovative projects, such as hard-timber forestry, agro-forestry and integrated cattle-crop-forestry:

- Dialogues with the insurance industry and Brazilian Reinsurance Institute (IRB) should be promoted in order to explore the potential for new insurance products directed to forestry and sustainable forest management. Public subsidies to the insurance industry could be offered to enable access to new insurance options.
- It will be necessary to assess the guarantees for forestry loans. Further legal or regulatory adjustments could be done in order to reduce the exposure of banks to risk in those operations. Contracts between farmers and industries and traders could also be taken into account in risk assessment. Banks, under the Protocol for Environmental Responsibility of Financial Institutions, should be encouraged to investigate future added value of forestry projects, such as carbon credits in voluntary or mandatory systems or environmental services payments.
- Investment funds in forestry projects and sustainable forest management could be created and managed by the National Bank of Economic and Social Development (BNDES). Specific incentives, such as early public funding or co-investment could be added for high-risk and pioneering projects.
- Assessment should be made of the regulation of future contracts. Specific forestry and sustainable forest management projects could demand adjustments, related to the length of contracts or to possible added value in the future. The prospects for forest bonds should be analysed, using future cash flows as security.

Conclusion

The Amazon and other natural or planted forests can play a decisive role in the transition for a low carbon economy in Brazil, both in terms of meeting the voluntary national commitments and of generating future carbon credits to be traded nationally or abroad.

There are uncertainties about international resources for forests, as well as remaining barriers to carbon credits from forests. A combination of different instruments and approaches are required in order to face the challenge of financing the transition to a forest-friendly economy in the Amazon. Special attention should be given to bilateral or multilateral agreements in order to empower new markets for carbon credits from forests, land use and land-use change.

Direct incentives for forest carbon-stocks and other environmental services in the Amazon will be required, while international negotiations about REDD-plus and carbon

markets advance. The new national mechanisms should be compatible with future REDD-plus or forest carbon credits, as well as being attractive to future private investments. Expenditure of public funding will be required in the short term and should be taken as public investments to create the basis for strategic competitiveness of economic activities in the Amazon.

Implementing Green Economy Policies in Barbados and Avenues for Corporate Engagement

Travis Sinckler, Barbados

Climate change and the impetus for developing the Barbados green economy

Barbados, like most of its Caribbean small island neighbours, has been categorised as highly vulnerable to the impacts of climate change.[1] Further, these impacts are deemed to threaten the social, economic and environmental infrastructure required for the sustainable growth and development of the country. Given its small size, limited resources and heavy dependence on imports, the country's adaptive response is extremely limited to issues such as climate change.[2]

Today, the economy of Barbados is centred on tourism, sugar, financial services and light manufacturing.[3] The sugar and tourism sectors have been regarded as the most susceptible to the effects associated with climate change.[4] Those effects include coastal erosion, land inundation, saltwater intrusion in aquifers, increasing temperature, altered variability and/or diminished rainfall, extreme weather events, loss of biodiversity and fragile ecosystems.[5]

Nevertheless, given the projected consequences and the complexity associated with climate change, all key revenue-generating sectors in Barbados are likely to be impacted significantly, hence the need for an integrated, multi-pronged approach to the climate phenomenon by government at national, regional and international[6] levels.

A number of policies, plans and programmes have been adopted to address climate-related issues over the last three decades. In large

[1] CEES, 2007; Brigulio, et al., 2008; Griffith and Gibbs, 2009; GOB, 2010

[2] CEES, 2007

[3] GOB, 2001; UNDP, 2007

[4] CEES, 2007; Brigulio, et al., 2008; Griffith and Gibbs, 2009; GOB, 2010

[5] GOB, 2001; CEES, 2007; Griffith and Gibbs, 2009

[6] It is important to note that Barbados' vulnerability to volatility in global energy prices and associated shifts in international food and transport costs heightens its economic vulnerability to developments in international climate-policy responses. This is best illustrated via the UK's imposition of a carbon tax on outbound travellers on long-haul flights as an economic measure in its climate mitigation policies. Barbados and other Caribbean tourism-dependent economies stand to be affected negatively due to increased transport costs.

part, these initiatives have been oriented to different sectors. They have nonetheless shown a progressive policy approach to mainstream climate adaptation and mitigation measures in the country's social and economic development framework (see table below).

Sector-specific responses to climate change in Barbados

Sector	Possible climate change impact	Policy response
Coastal marine resources	• Inundation of seagrass beds and mangrove swamps • Intrusion of saline water into coastal wells • Erosion of beaches and coastal lands due to sea-level rise and changes in coastal processes • Decline in productivity of fisheries due to sea temperature increases • Increase frequency of severe rainstorms and associated increases in chemical run-off from farms and lawns	• National sustainable development policy • Physical development planning • Integrated coastal zone management • Marine pollution control policy • South and west coast sewerage management infrastructure projects
Water resources	• Changes in temporal and spatial distribution due to increased climate variability and occurrence of severe events • Contamination of ground-water due to salt-water intrusion • Sedimentation of dams and reservoirs due to increased soil erosion • Water shortages and drought due to increased evaporation • Reduced aquifer recharge	• Physical development planning • Integrated water resources management (including irrigation technology deployment, reforestation, improvement in water distribution, water conservation education, etc.) • Storm water management strategy • Integrated coastal zone management • Strengthen science–policy interface via research partnerships (government and universities)

Agriculture	• Increased demand for water for irrigation due to increased temperatures • Increased proliferation of agricultural pests • Reduced crop production (yield, diversity and quality) • Leaching of fertilisers during flood events • Accelerated soil erosion and increased salinity • Reduced productivity due to heat stresses in poultry and livestock • Increased insurance premiums for producers	• Sustainable agriculture development • Strengthen science–policy interface via research partnerships (government and universities) • Crop insurance/reinsurance schemes
Tourism	• Damage to coastal tourism infrastructure • Loss of economic returns and general amenity losses due to changes in ecological resource base • Reduced visitor arrivals due to frequency of extreme weather events and competition from traditionally colder regions • General destabilisation of investment climate	• Sustainable tourism development planning including diversification strategy • Physical development planning • Integrated coastal zone management strategy • Strengthen science–policy interface via research partnerships (government and universities)

Human health	• Increased incidence of vector-borne diseases • Higher occurrence of heat-stress related illness and conditions • Increase in airborne particulates and frequency of respiratory ailments due to higher temperatures • Injury and loss of life due to climate effects on environmental conditions (flooding, contaminated water, unsanitary conditions, respiratory diseases)	• Integrated health planning • Strengthen public health systems • Institutional development and capacity-enhancement programmes • Strengthen science–policy interface via research partnerships (government and universities)
Human settlement and infrastructure	• Damage to coastal property and infrastructure due to storm surges • Damage to houses etc. due to increased intensity and frequency of cyclonic events • Loss of income	• Physical development planning • Fiscal policy • Financial sector engagement • Strengthen science–policy interface via research partnerships (government and universities)
Financial sector	• Effect of catastrophic events on lending institutions, insurers and property owners • Diversion of financial resources from productive investment to restorative and preventative activities • Adverse effect of food supply leading to an increase in food import bill and rise in the cost of local produce • Reduced income from leading sectors	• Fiscal and financial policy measures • Physical development planning and associated standards (building codes) • Environmental and social risk management • Economic diversification via national development planning processes

Source: extracted from CEES Inc., 2007

Integrated approaches have however been of recent vintage. Most notable are the Integrated Coastal Zone Management Policy,[7] the Physical Development Plan–Amended 2003,[8] the Barbados Sustainable Development Policy[9] and the National Strategic Plan (NSP) 2006–25.[10] In the context of the latter, Barbados' thrust towards a green economy has been articulated.

The concept of a green economy

A green economy can be viewed as a "system of economic activities related to the production, distribution and consumption of goods and services resulting in improved human well-being over the long term, whilst not exposing future generations to significant environmental risks and environmental scarcities".[11]

The green economy encompasses the three pillars of sustainable development – environment, economy and society.[12] Where necessary, it requires policy reforms and investments geared towards reconfiguring businesses, infrastructure, and institutions, and the adoption of sustainable consumption and production processes. Reconfiguration in this context is intended to lower energy and material intensity, lower waste, pollution, and greenhouse gas emissions, and by doing so create new jobs.[13]

The greening of economies has been promoted by the UN as one of the major goals of the Marrakech Process[14] – a global process established in 2003 to support the elaboration of a 10-Year Framework of Programmes (10YFP) on sustainable consumption and production,[15] as called for by the 2002 World Summit on Sustainable Development.[16]

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[7] GOB, 1998

[8] GOB, 2003

[9] GOB, 2004

[10] GOB, 2007

[11] UNEP, 2010

[12] ibid

[13] ibid

[14] The goals of the Marrakech Process, a United Nations Environment Programme (UNEP) and United Nations Department of Economic and Social Affairs (UN DESA) coordinated initiative, are:

- to assist countries in their efforts to green their economies;
- to help corporations develop greener business models; and
- to encourage consumers to adopt more sustainable lifestyles.

See http://esa.un.org/marrakechprocess/.

[15] Sustainable consumption and production (SCP) is defined as "production and the use of goods and services that meet basic needs and improve quality of life, minimising the use of natural resources, toxic materials, as well as the generation of waste and pollutants over the life cycle of goods and services, without undermining the capability of future generations to satisfy their own needs."

[16] UN DESA, 2010

In recent years, climate change has placed green economics high on the global agenda.[17] As such, this political nexus is proving catalytic in focusing simultaneous attention on a broad range of sustainable development challenges, including the global financial and economic recession, rising poverty, rising costs of agricultural inputs and food, access to safe and reliable freshwater resources, ecosystems degradation, rising energy costs, and last but not least the ensuing climate crisis.[18] The green economy can therefore be considered a multi-sector, global development policy response in this context.[19]

Description of Barbados' existing green economic policy framework

In the Barbadian context, a green economic framework as articulated in the National Strategic Plan (NSP) 2006–25, recognises climate vulnerabilities and the potential risks to the systemic devastation of the economy.[20] As such, the NSP embodies strategies to address climate-related issues pertaining to water, energy, disasters, transport, land use and ecosystems fragility.[21] The specific objectives in this context are to:

- promote and facilitate the sustainable use of our renewable resources and the wise management of our non-renewable natural resources;
- maintain a safe and reliable water supply;
- ensure an efficient and reliable energy sector;
- develop an efficient transport system and infrastructure;
- improve disaster management; and
- develop and maintain an efficient land-use policy.

Several strategies and targets were also indicated for each of above objectives.

Further sector-specific strategies were also outlined in the 2007 Economic and Financial statement.[22] Then, it was stated that," ...the notion of a green economy must be underpinned by the philosophy of putting Barbados on a sustainable economic growth pattern that incorporates prudent environmental management principles". The policies articulated further recognised physical limits to growth; the interrelationships between economy and environment; as well as scope for heightened efficiency via enhanced synergies between sectors.

Specifically, the primacy of energy, water and waste as development challenges and as the bases for achieving building conservation, efficiency and resilience were highlighted as the foundation of the policies. The specific measures are presented below and summarised in the following table.

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[17] Cato, 2009

[18] United Nations Interagency Statement, 'The Green Economy: A transformation to address multiple crises', 2009

[19] UNEP, 2009

[20] GOB, 2008

[21] GOB, 2008

[22] Alleyne, 2007; GOB, 2007b

Summary of Barbados' 2007 green economic policy

2007 Green economic policy element	Directive summary
Green economic indicators	Develop and publish targets and indicators of green economics and sustainable development
Carrying capacity	Conduct a national carrying capacity survey of Barbados' ecosystem
Environmental levy	Increase levy from 1% to 2% to assist in financing environmental management programmes
Greening of government (Public Sector Conservation Programme Part 2)	• Incorporate environmental considerations into all aspects of government • Develop a procurement guide for the Government's Central Purchasing Department
Resource conservation: water, energy and waste	Conserve energy and water and minimise waste
Food and agriculture	Promote the use of local foods in hotels and the development of 'Bajan haute cuisine'
Clean energy investment (conservation, efficiency and renewable energy)	• Set environmental benchmark for green businesses seeking to promote products and services in Barbados • Promote investment in renewable energy technology, conservation and efficiency • Offer incentives to companies establishing bio-diesel plant
Retail sector	Collaborate on the articulation of a new tax regime for the importation of green products
Transport	Develop and promote sustainable, efficient, competitive approaches and incentives in the sector

Built environment efficiency and households	Identify and support recognised certifications for various sectors (building, tourism, and manufacturing)
	Develop green building regulations and standards, and sustainable building practices
	Establish incentives to promote the development of Warrens as a green suburban centre
	• Develop appropriate green home checklists, certification and incentives • Composting • Recycling

With respect to manufacturing, the policy seeks to promote the deployment of renewable energy technologies, and energy conservation and efficiency measures to support high-value niche products.[23]

In the area of agriculture, integrated approaches to the management of water resources, pests and land were highlighted, along with a call for greater use of local produce in the tourism industry. A call for greater uptake of incentives to support sustainable agricultural production was also made.

The policy emphasised green business development as a new area for the country's investment promotion strategy. The establishment of environmental benchmarks for the operation of various sectors was highlighted as a tool in this respect. Venture capital facilities provided by government were also earmarked as a means to integrate environmental conditions. Renewable energy technology, energy conservation and efficiency were identified as key opportunities for further investment.

The policy proposed new guidelines to embed green principles into government procurement. This measure was seen to have the multiple benefits of reducing overall costs, reducing wastage and last but not least incorporating cleaner and safer products to be used within the public sector.

Measures were also promoted to facilitate the uptake by industry of internationally recognised environmental certification schemes. The manufacturing, tourism and building and construction sectors were highlighted. The targeted outcome was

[23] GOB, 2007b

the systemic embedding of sustainable development principles by the private sector in key areas of the economy. This was viewed as an avenue to heighten Barbados' trade competitiveness in the global marketplace.

In the area of building and construction, the policy called for:

- the establishment of green building regulations and standards;
- the promotion of the reuse of construction hoarding and demolition debris as a means of lowering construction costs and foreign exchange expenditure;
- the establishment of incentives that promote the development of green business town centres in three strategic locations as models for future development.

The generation of employment, the diversion of waste from landfill and the potential for intellectual property development in the application of innovative building technologies were also projected benefits associated with this policy intervention.

Tourism, given its centrality to the country's development as well as its vulnerability to climate change,[24] was identified as a significant platform for action on Barbados' transition to a green economy. Broad policy support was given to promote the adoption of green tourism practices and environmental certification in the sector as well as to provide incentives that promote sustainable links between tourism and agriculture, with respect to food security, for example. Support was also reiterated – as in previous years – for the provision of opportunities for significant energy and water savings within Barbados' hotel infrastructure.

In the transport sector, the energy policy was viewed as a way to promote efficiency as a means of reducing environmental and economic costs. Support was given to the use of alternative fuels and complementary capacity development programmes, as well as increases in the use of lower emitting vehicles. Duty and excise tax exemptions were outlined as the measures to be employed. Targeted benefits in that respect were:

- reduced fuel import bills;
- reduced operating costs for public transport;
- cleaner air, soils and groundwater with less incidence of associated illnesses and accompanying health costs.

The role of the distribution sector was also spelt out in regard to making 'green products' accessible to householders. A lower tax regime was proposed in this respect for products that assisted in energy and water conservation, and waste minimisation.

Further householder engagement was provisioned in the policy via green home certification schemes under the ambit of the Town and Country Development Planning Office. There were also proposals to review

[24] Griffith and Gibbs, 2009

incentives to support composting and recycling activities among households.

Barbados' green economic policy framework: a preliminary analysis

Three years after the green economy pronouncement, there remains high-level political commitment to the stated green economy thrust as witnessed in the March 2009 Economic and Financial Statement in which a vision for Barbados becoming "the most environmentally advanced green country in Latin America and the Caribbean" was announced. And, more recently, it was reiterated in the country's medium-term sector strategy for 2010–14.[25]

There was wide consultation over several years in the design and development of the NSP. Input was sought from government institutions, the corporate sector, labour institutions, academia and a large range of civil society institutions.

With regard to institutions, in 2008, the lead ministry for the green economic policy, the Ministry of Environment, Water Resources and Drainage (MEWD), was reformed to consolidate issues pertaining to water, waste, coastal resources management, ecosystems monitoring and environmental pollution control, offering scope for significant collaboration in implementing several aspects of the NSP. Issues pertaining to transport, energy and disaster management, other thematic areas under the NSP, remain in separate administrative jurisdictions. Nevertheless, close collaboration occurs in the form of policy consultation and project management on several cross-sectoral matters.

Since the 2007 measures, various committees have been established and work streams identified to provide further in-depth analysis of specific issues. There have also been amendments to the legislative framework, via the Income Tax Act, to support the adoption of corporate certification schemes. There is, however, a need to promote this provision as well as identify complementary mechanisms to facilitate its uptake.

In the area of consultation and information provision, initial efforts have been made to engage various stakeholders on various aspects of the green economic policy. Tools employed in this respect have included: stakeholder meeting; technical working groups; focused policy assessments; public survey administration and public information campaigns.

At present, two institutional mechanisms have been specifically employed in this respect, namely the National Sub-Committee on Trade and Environment (NSTE) and the recently established Barbados Sustainable Finance Group.[26] As the name suggests, the NSTE provides a forum for discussing two-way interactions between trade and environment policy issues, at domestic, regional and international levels.

[25] GOB, 2010b

[26] Alleyne, 2010

In 2008, at its annual seminar, the committee engaged a wide cross-section of businesses, non-governmental organisations and government agencies on various aspect of the green economic policy. One of the key outcomes was an agreement to establish working groups to provide focus on finance and investment, greening suburban centres, and sustainable consumption and production.[27] To-date, one working group has been established, namely the Barbados Sustainable Finance Group (BSFG).

The BSFG comprises the corporate/retail banking sector and a number of government agencies. Its role has been primarily consultative to government, and has provided focus on the issues of environmental and social risk management, including climate change.[28] Activities undertaken to-date include the joint commissioning of research over the period 2008–09, as well as facilitating focused training in environmental and social risk management.[29]

Overall, despite progress in the above respects, it is important to note that the policy is still in its infancy and as such will require a substantial system-wide effort to fully integrate the stated green principles and moreover to ramp up action on the implementation of the various measures. Wider engagement of key institutions in the business, and civil society sectors will be critical in moving ahead in its implementation.

Alleyne (2008) outlined a number of challenges for consideration in order to assist in making the green economic policy operational, namely:

- the need for sectoral cost–benefit analysis with respect to policy implementation;
- the need to analyse capacity needs within government to support policy delivery;
- the need for further integration of environmental management in national economic development planning, coupled with system-wide sensitisation;
- the need for further focus in ensuring existing fiscal incentives support environmentally responsible behaviour in business;
- the lack of accounting of ecological assets; and
- the lack of a holistic public education campaign.

Moving the green economic framework forward: proposed actions for business engagement

As pointed out in the previous section, the building of a green economy is reiterated in the country's new medium-term development plan.[30] In the Barbadian context, the opportunity exists for specific attention on widening the governance regime for greater engagement of the business community in the policy's implementation. There is

[27] GOB, 2008c

[28] GOB, 2009

[29] GOB and BSFG, 2009; Alleyne, 2010

[30] GOB and BSFG, 2009; Alleyne, 2010

scope for research and application of clean and eco-efficient technology deployment over the medium term in several sectors, as well as a special focus on mainstreaming sustainability in business education at several levels. Monitoring and communicating progress must also be viewed as an essential component of the policy's rollout.

With respect to governance, a larger consultative mechanism, as compared to the two existing bodies, requires establishment in the short term to facilitate greater cohesion and system-wide action on all aspects of the green economic policy. It is important that all sector associations, academia, labour unions, consumer organisations and government be represented in this framework. The former National Commission on Sustainable Development that was instrumental in providing the multi-stakeholder forum for the articulation of the Barbados Sustainable Development Policy can be reinstated for the above purpose. In this regard, MEWD will consider facilitating the establishment of such a body during the Government's financial year 2010–11.[31]

Another area for action is the application of clean or eco-efficient technologies in several sectors identified in the policy. There is a need to undertake assessments of applicable technologies with respect to water and energy efficiency and waste minimisation. Scope exists for a collaborative approach between government and trade associations in the near term. There is also scope to adopt a Caribbean Small Island Developing States (SIDS) regional approach in this regard in order to achieve economies of scale. It is proposed that a pilot industrial ecological assessment be undertaken in 2010–11. The tourism, SMEs and manufacturing sectors can be piloted during this phase.

Secondly, in collaboration with the NSTE, the MEWD will also consider the development of a cross-sector technical institutional mechanism to support industry transition towards an eco-efficient model. The role of financial institutions will also be critical in this respect, in designing innovative financial products to support investment in cleaner technologies. It is further proposed that the MEWD, NSTE, manufacturers, industrial institutions and the BSFG undertake a feasibility study for the establishment of an institutional and programme support mechanism to enable the eco-efficiency transition. Development and multilateral agencies can be engaged in this respect.

The third area of proposed action is business education. Sustainability education to-date in Barbados has largely been the domain of the natural sciences. Embedding this concept will however require integration across several faculties/disciplines. In the context of current business education, curricula assessments should be undertaken to identify opportunities for developing existing concepts and case

[31] The author is a representative of the Ministry of Environment, Water Resources and Drainage (MEWD) of the Government of Barbados. Unless otherwise specified, all recommendations given will be undertaken in the context of MEWD.

studies, or integrating new theories where applicable. To this end, MEWD should facilitate a discourse among various national, regional and international institutions over the coming months.

A national indicators and communication project to support the green economy will be essential to track progress on the implementation of the green economy policy and to support the engagement process.[32] The MEWD will continue to engage key agencies involved in collation of national statistics as the means of embedding green economic statistics in social and economic reporting.

Closely related is the need for a consumer education platform within a broad national green economic education strategy. Already the MEWD has undertaken a national survey of various audiences on the 'meaning of the green economy'. This information is critical for business and market planning for both national and international corporate stakeholders. The execution of an information sharing strategy via the government information system and via various umbrella business institutions is therefore recommended. In addition, partnerships with non-governmental organisations with an interest in promoting sustainable lifestyles should be undertaken.[33]

Last, and not least, is the need for a dedicated technical coordination secretariat to support the implementation of the green economic policy elements. To this end, over the next 12 months the MEWD should consider engaging international financial and technical institutions with vested interests in supporting green economic development.

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[32] The four areas highlighted above will be the focus of this author over the next two to three years. Over the next twelve months, there is need for attention on establishing the appropriate institutional mechanisms for catalysing further action on the green economy.

[33] Already, a non-governmental organisation has approached the MEWD in this respect. King-Brathwaite 2010, Environmental Education Officer, MEWD, GOB, personal communication.

[34] The author proposes to focus on the business sector in the short to medium term. And further, to undertake the following actions:

- Facilitate the establishment of a multi-stakeholder consultative mechanism on the green economy;
- Assess the potential for research on and deployment of clean and eco-efficient technologies in key sectors via trade associations, in the areas of tourism, small- and medium-sized enterprises, and manufacturing;
- Explore the mainstreaming of sustainability in business education. The application of the CPSL model to Barbados and the Caribbean will be assessed as the point of departure;
- Support, and where necessary facilitate, the mainstreaming of green economic indicators in national social and economic reports;
- Establish a partnership with civil society institutions in promoting sustainable lifestyles; and
- Explore the establishment of a technical secretariat to support the coordination of the policy's implementation.

Conclusion

The green economic policies present Barbados with new opportunities for addressing climate change vulnerabilities from both structural and strategic development standpoints. It offers the opportunity for new investment in efficiency gains with respect to energy, water and waste. It appeals to several economic sectors and forges partnerships among government, business and civil society. What is now required is cohesive, concrete action by all actors.[34] Government leadership via policy, programmes and regulations is essential to the implementation of the Barbados green economic transition. Equally important is the strategic involvement of the corporate sector in the design, execution and continual evaluation of this new policy thrust.

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Who's More Self-Righteous?

A quick look at the common mistakes and misconceptions that prevent scientists and journalists from understanding each other

Augusto Townsend Klinge, Peru

As a journalist from Peru, a country in which climate change is something everybody is afraid of – but no one truly understands – it was really exciting to arrive in the UK when the media coverage of the 'Climategate' scandal[1] was at its peak. In fact, I was doing my research for this essay in the offices of the *Guardian* (where I was placed for two weeks as part of the Chevening Programme) in the days prior to the paper's release of a 12-part investigation on said scandal. Even though the *Guardian's* conclusion was that the leaked emails "cannot destroy the argument that the world is warming", the *Telegraph* had previously asserted that Climategate was "the worst scientific scandal of our generation", and one of its bloggers even suggested that it was "the final nail in the coffin of 'Anthropogenic Global Warming' ".

In a strange twist of events, the villains in the climate change debate were no longer the oil and coal lobbies or the uncompromising governments of the heavy polluting countries, but the scientists who identified the problem in the first place. Even the *Guardian's* own environmental columnist George Monbiot said shortly after the hacked emails were released last November that, "Pretending that this isn't a real crisis isn't going to make it go away. Nor is an attempt to justify the emails with technicalities. We'll be able to get past this only by grasping reality, apologising where appropriate and demonstrating that it cannot happen again." Clive Crook, the *Financial Times* Washington columnist, had even harsher words for the climate scientists involved in the affair: "The closed-mindedness of these supposed men of science, their willingness to go to any lengths to defend a preconceived message, is surprising even to me. The stink of intellectual corruption is overpowering."

In the three months I've been in Cambridge, I've heard and spoken to more than a dozen scientists with different academic backgrounds (whom unfortunately I cannot name because those discussions were held under Chatham

[1] Phil Jones, Michael Mann, Keith Briffa and other climate scientists were accused of committing alleged acts of misconduct (such as concealing information, covering flawed data or censoring scientists with diverging opinions from publishing in peer-reviewed magazines) after more than 1,000 emails and other documents which showed personal conversations between them were hacked from the University of East Anglia's Climatic Research Unit (CRU) and released online in November 2009.

House rules). Most of them reluctantly refer to the acts of their colleagues involved in the Climategate scandal as "silliness" and recognise – while lowering their voices – that this episode surely looks ugly, but immediately after stress the soundness of the science behind climate change. However, it is clear that in the past months something has radically changed in the way scientists rank the villains in this complicated story. There's a new addition to the top three: the media, given its recent crusade to misrepresent scientists as a group of flawed professionals engaged in some kind of global conspiracy to hide the truth from laymen.

So, what's your story?

In one of the first lectures I heard in Cambridge, a top UK scientist lambasted the media for constantly misquoting his comments and for not being sufficiently interested in the crucial things scientists like him had to say about issues such as climate change. As I listened to his presentation, I thought to myself: "If I wasn't here as a student but as a journalist, which five core ideas would I consider if I were to write an article on this lecture?" I couldn't think of two. He basically spoke for an hour without saying anything concrete.

So, is the journalist always to blame if the source has been misquoted? In an ideal world, the journalist will always be responsible for two reasons. First, one should never leave an interview with doubts about what was said; and one should never write about something that one is totally not convinced about. But in the real world, not only do journalists have to battle with the scarcity of time and the tyranny of deadlines, but with the complications introduced by the source itself. For instance, the message may well have been provided without sufficient clarity or without stressing the core ideas. Scientists have a strong tendency to do this (they ignore the fact that not everybody speaks their own language), exacerbating the possibility of being misquoted. In other words, they should feel co-responsible for any inaccurate statement if their lack of clarity has been a significant contributing factor to the mistake.

In his second criticism, the abovementioned scientist argued that the media is not sufficiently interested in what scientists have to say. This is completely true, and the reason is that the vast majority of scientists don't know how to provide journalists with a message they could easily transform into a 'story'. Notice I've used the word 'story' here, because that's exactly what journalists write about: heroes, victims and villains struggling through intricate journeys. While science is generally about things, news is always about people. People don't empathise with inorganic lists of facts, but with other people and their own particular situations.

Businesses, which have been dealing with the press for a very long time, know exactly how to give a journalist a story that could be easily turned into an article. Politicians and NGO officers are also very good at this. In the particular case of climate change, scientists are telling a story no one wants to hear, because their own versions don't have a happy ending. In this sense scientists, and academics in general, need to learn how to 'play the game'

and compete with everybody else for the limited space the media has to offer.

It should also be noted that since climate change became an economic and geopolitical issue (and, therefore, discussed increasingly by economists and politicians rather than scientists) its coverage by the media has skyrocketed to a point were people are now talking of 'green fatigue'.[2] So, instead of ignoring it, the media appears to be publishing or broadcasting climate change 'stories' in an excessive way. What we should ask ourselves is: has the issue been addressed properly?

Not so balanced

Why is there so much divergence between journalists if there is consensus among scientists around the risks of climate change? Here's my answer: you will never find the world 'consensus' in a journalist's dictionary. There's no such thing as consensus for a journalists because they are trained to find more than one side to every story (heroes exist only if they coexist with villains). In fact, any person who addresses a journalist saying that he or she knows the 'absolute truth' about an issue will immediately generate suspicion. Actually, when you think of the consequences of using the word consensus, some of them may well be counterproductive. Talking about consensus shifts the focus from national to international stories, thus inhibiting individual action by making the ordinary person feel powerless against this global problem.

Now, journalists commit numerous mistakes when they try to portray climate change as an issue with different viewpoints (which it inevitably is, no matter how passionate scientists are about their own consensus). They generate debates between sources that don't have the same level of expertise, thus giving the impression that all are equally prepared to express a categorical opinion. Journalists incorrectly suggest to their audiences the idea that scientists are split, with equal numbers on each side of the argument, because they quote the same number of scientists to defend each stance. This is flawed journalism. If nine out of ten climate scientists believe in anthropogenic climate change and one doesn't, they don't need to quote nine scientists to contradict the remaining one. They just need to make sure that their readers, listeners and viewers clearly understand that a particular position has, in relative terms, much more support than the other, which in turn may be a relevant indicator to judge its trustworthiness.

It also should be taken into account that some actors in this debate (for example the lobbies of the businesses that have a lot to lose if action was globally implemented against climate change) may not be particularly interested in winning the debate, but just

[2] 'Green fatigue' leads to fear of backlash over climate change', The *Guardian*, December 30 2007; 'I'm so tired of being green', *Newsweek*, July 7 2008; 'Have you got green fatigue?', *The Independent*, September 20 2007; 'That Buzz in Your Ear May Be Green Noise', *The New York Times*, June 15 2008

in portraying an image of division between scientists. Journalists should be aware of this and avoid being manipulated in a way which is not conducive to their main objective, which is to discover the truth.

Another handicap which journalists have to overcome, especially when dealing with long-term issues such as climate change, is their tendency to focus on incidents instead of trends. Sometimes an incident (e.g. a car accident) may be so visually striking that it may hide the fact that the overall number of such incidents may well be decreasing. The opposite is also true: the fact that a trend develops in small incremental changes (e.g. sea-level rise) may hide the fact that it could become very difficult to manage after a few decades.

Anyhow, what has to be understood by scientists is that it is not the same to question a journalist for the quality of his facts than for the quality of his opinions. Facts are either correct or incorrect, and journalists should be held responsible when they commit mistakes for not being sufficiently rigorous or diligent. Opinions, however, cannot be correct or incorrect, they're just interpretations of reality that may be more or less persuasive, and should be criticised in these terms.

So, even when the facts surrounding an issue are totally agreed upon, journalists will always disagree on what to do if there is some degree of uncertainty on future outcomes or if ideology plays a role in solving a problem. Actually, this is a positive thing because, when it comes to opinions, no one is infallible. Journalists are sometimes accused of complicating otherwise simple discussions, but they have a strong argument to defend themselves: they know that if mistakes are made in the process of finding a solution to climate change, the consequences could be as severe and, thus, as immoral, as not doing anything about it.

I'm not Phil Jones

Having said that, would it be logical for a journalist to conclude that every climate scientist, or every scientist for that matter, has the same flaws shown by scientists involved in the Climategate scandal? Of course not; to generalise in an issue like this would be totally improper. I've spoken in Cambridge with several climate scientists that seem to be extremely rigorous in their work and particularly honest in saying what they know and what they don't know in relation to climate change.

So why is it then that scientists always speak of 'the media' as if every newspaper, magazine, TV channel or radio station were identical to each other? Isn't that a similar questionable generalisation? The media is a large group in which the most diverse organisms coexist.

In fact, a common mistake scientists commit is not understanding these differences and, thus, talking to a newspaper reporter in the same way they would talk to the editor of a scientific magazine. They also need to understand that the media is no longer comprised only by written press, TV and radio. Some scientists ignore the increasing importance of the

blogosphere and what has been called 'citizen journalism',[3] as opposed to conventional journalism. In the 1960s and 70s the legendary anchorman of CBS Evening News, Walter Cronkite, was considered the "most trusted man in America"; now Jon Stewart, the host of The Daily Show, is considered the "most trusted man in America" even though he is a comedian. In fact, the hacking involved in the Climategate scandal was initially attributed to the Russian secret service[4] and to the oil companies,[5] but it was later acknowledged that the Climatic Research Unit (CRU) had carelessly left an open server from which skeptical bloggers were able to pick up the controversial emails.[6]

These trends are already changing what people understand as the media (for example, the financially troubled printed press is currently battling with the alternative of free online content), but this will not be the end of certain misconducts that have always percolated in (bad) journalism. Here are some:

- **Journalists aren't sufficiently self-critical or suspicious of the trends they report on.** Thus, they get overenthusiastic when certain trends become popular and avoid analysing if they're really sustainable. An example of this: they cheered the banks all the way up until the fall of Lehman Brothers, when the subprime crisis exploded.
- **Some media are excessively weary of the sensitivity of their advertisers.** They perceive an implicit (and sometimes even explicit) threat from their advertisers as to what the consequences may be if they publish stories that affect their interests. The iron curtain between editorial and commercial teams is not well established.
- **In an increasingly competitive environment, journalists tend to become more radical to get more attention.** This is the case of the weatherman that refers to any strong storm as 'snowmaggedon'.
- **And, of course, some media are simply the extension of special interest groups**. As such, they defend the economic interests of those who control them. This is increasingly happening in the blogosphere, where the true identity of the controlling parties is easy to conceal.

Clearing the communication lines

During my stay in Cambridge, I've come across a number of people who believe the media has an educational role. Maybe so, if you're talking about the state-owned media. The privately-owned media's main duty is not to educate, but to inform. This means that it will tend to relay what its particular audience will find helpful to make everyday decisions. Its journalistic agenda will be determined, therefore, by the permanent interaction

[3] http://en.wikipedia.org/wiki/Citizen_journalism

[4] *New Scientist*, 'Climategate: Russian secret service blamed for the hack', December 7 2009

[5] http://www.desmogblog.com/oily-echo-machine-behind-climategate

[6] The *Guardian*, 'Search for hacker may lead police back to East Anglia's Climatic Research Unit', February 9 2010

between the medium and its audience, and will also be influenced by what its competitors are doing or not doing. Its main moral obligation in this circular relation is always to tell the truth.

But saying that the media has to speak the truth is very different from saying that it is responsible for saving the world by convincing people to do what they must do in order to tackle climate change. This is actually the role of scientists, along with educators and politicians. They have the responsibility of reaching out to the media and explaining in clear terms why climate change is relevant to their specific audiences. Journalists, on the other hand, have to be intellectually honest enough to objectively inform their readers, listeners and viewers about an issue such as climate change, even if the consequences are not going to be felt in the short term and it implies difficult choices.

There are many aspects in which scientists and journalists tend to differ. Scientists explain and then conclude, while journalists conclude and then explain. Scientists and journalists have different perceptions of risk: the former focus on the wider picture while the latter focus on individual impact stories. Scientists tend to be incredulous towards journalists and they assume a defensive position when addressing them; journalists tend to pick on sources they find hostile. On top of everything, scientists are self-righteous; and journalists don't like competition in this field.

Even so, I truly believe scientists will learn in due time how to play the media game and develop a relationship of mutual trust with journalists (as some have already done). My opinion here is biased because I am in fact a journalist, but I think I have some tips that may be helpful for any scientist who has the intention of engaging a journalist on a specific issue:

- **First of all, understand the characteristics of the particular audience**. The level of complexity of the language you use should be directly proportional to the level of sophistication of the readers, listeners and viewers. It may sound laborious, but it's not a bad idea to consider how different media cover climate change and alter your message appropriately. This raises the chances of your comments being published or aired.
- **Learn how to outsmart journalists at their own game**. If you ever thought to yourself, "I have a Ph.D, I don't need media training", you were absolutely mistaken. Journalists are trained by experience to take advantage of the involuntary errors you may commit, like saying too much or saying too little. Universities need to have strong public relations departments to help scientists in this process.
- **The key word is 'exclusive'**. You have to convince journalists that their competitors would love to have your information because the issue in hand has direct implications for readers and, by informing them, they will be one step ahead of the other journalists.
- **Your 'story' needs to have living characters,** people of flesh and bone that find themselves at a crossroads and can take right or wrong decisions. Remember,

it's not about an abstract phenomenon also known as 'climate' and the accumulation of an invisible gas otherwise known as CO2, but about people who may live or die, get rich or poor, keep their homes or migrate, continue as usual or radically change their lifestyles.

- **There always needs to be a light at the end of the tunnel**. Prophecies of doom are only interesting if they're happening to somebody else. If the statistics are frightening, show them but immediately after shift the focus to the solutions. Everybody can be a hero in this story.
- **Use lots of visual aids:** graphs, pictures, easy to understand data. Journalists may forget who Michael Mann is, but they'll probably remember his infamous 'hockey stick graph', which has been widely used to show the temperature increases in the past century.
- **Don't let journalists do all the asking, save a couple of questions for them**. If you're not sure if journalists understand what you're telling them, test them directly by asking a couple of questions. If you don't get a good response, offer to help with the technicalities in the article (in which case you should never try to alter the writing style, but only point out any inaccuracy).
- **Don't respond to skeptical arguments with complicated, technical explanations**. If they're doing their job correctly, journalists will confront you with skeptical arguments to test the soundness of your own arguments. Never dismiss these comments as intellectually inferior and avoid answering them in a way only other scientists would understand. It will only make matters worse.
- **Stress the important stuff in short and clear sentences, and provide conclusions**. Remember, the space will always be limited so don't expect a journalist to quote every single word you say. This is no different from teaching a class: people need to know what topics may show on their exams.

If climate change is really as dangerous as climate scientists tend to believe it is, then a better relationship between scientists and journalists is not only a win-win proposition, but an unavoidable step to build the foundations we'll need to achieve a massive response from the public.


NORTH
AMERICA

Post-Copenhagen Reflections on Climate Change and California Energy Policy

Andrew Schwartz, USA

California Global Warming Solutions Act

Probably for the better, Copenhagen did not represent an inflection point in the course of California climate and energy policy. Several years before, the state had passed its landmark climate legislation, the California Global Warming Solutions Act of 2006, which committed the state to binding emissions reduction targets largely consistent with the recommendations of the United Nations Intergovernmental Panel on Climate Change (IPCC) regarding the magnitude and timing of reductions required to avoid catastrophic disruption of the climate system. The legislation requires the state to reduce its aggregate emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. To put this into perspective, given expectations of population growth in the state, these goals mean that the per capita CO_2 emissions in California will have to drop from current levels of 13.3 tonnes, to 9.6 tonnes by 2020, and to approximately 1.4 tonnes by 2050.

Existing sustainable energy policies in California

The Climate Solutions Act itself serves as something of a unifying framework for a variety of existing sustainable energy policies that have been implemented in California, some dating back over three decades. California's interest in alternative approaches to energy is motivated by a number of factors, of which the climate issue is a relatively new, albeit increasingly important, consideration. However, prior to climate change, concerns about energy security, public health and economic development had already motivated a substantial commitment to clean energy. These policies encompass demand-side solutions, like energy efficiency and demand response, as well as supply-side approaches to promote widespread deployment of zero and low emissions generation technologies.

Although the Global Warming Solutions Act includes provisions to establish a cap-and-trade regime, notably, of the estimated 174MtCO_2-eq of emissions reductions that will be needed to achieve the 2020 goals, almost 80% of those will be achieved through command and control policies under which the energy choices are largely defined by government mandates rather than unconstrained market forces. California has elected to pursue a market-on-a-leash strategy, recognising that as much as we

would like to believe we can simply 'set it and forget it', a cap-and-trade regime alone is unlikely to be sufficient to push the state on to the low emissions pathway necessary to realise the 2050 targets.

Translating policy into reality

The key challenge for California, at least currently, is not the absence of the will to act; rather, the challenge remains in translating policy into physical reality. A case in point is the state's renewable energy mandate, which requires the state's privately owned utilities, which account for the majority of electricity in the state, to procure at least 20% of their electricity from renewable sources by 2010. This target is likely to be expanded to 33% by 2020. In pursuit of this goal, the utilities have entered into contracts representing thousands of MW of renewable capacity. Yet despite the extensive level of contracting, the pace of actual renewable construction has been slow. Of the 12,000MW the utilities have under contract, only 1,049MW have come online since the programme's inception. Several key barriers exist, some of them related to the global credit crunch, others having to do with the state's rigorous environmental permitting processes which can lead to substantial delay in the deployment of new infrastructure.

Meaningful progress

Despite these challenges, California is making meaningful progress in its efforts to decarbonise its energy system. Efforts to streamline permitting processes and build consensus across stakeholders are being pursued and, despite the formidable challenges project development has faced, we are seeing increasing number of contracts bearing fruit. In 2009, 359MW of new renewable capacity came online. Additionally, there is increasing interest in pursuing a more distributed approach, relying on smaller scale projects rather than larger projects that have represented the majority of capacity under contract to-date. While forgoing the economies of scale that larger scale projects enjoy, smaller scale projects (20MW or less) may be advantaged to the extent they don't require vast amounts of contiguous land, nor do they require the substantial transmission upgrades that are typically needed to interconnect larger projects.

Equally if not more important, the state's energy efficiency programmes remain an exemplar of the so-called 'no regrets' policies, those initiatives that make sense both from a climate change perspective as well as from a pure economic standpoint regardless of whether or not a carbon price has been established. California's approach to energy efficiency is multi-tiered, encompassing efforts to reduce the vested interest the utilities have in energy consumptions by decoupling their revenues from energy sales and providing meaningful earnings opportunities for investment in energy efficiency in lieu of supply-side resources. These programmes, combined with robust appliance and building standards, and ratepayer-funded energy efficiency programmes, have contributed substantially to California's ability to keep its per capita electricity consumption flat over the past thirty years, and energy bills lower than average despite higher than average rates.

Leading by example

For all its failings, Copenhagen did cast into stark relief the key barrier to a global climate framework, namely the understandable reluctance of emerging economies to commit to targets that appear likely to conflict with their development agendas. Given their less than proportionate contribution to the climate problem and the political pressure and moral imperative they face to improve the quality of life of their citizens, a binding treaty with aggressive targets is a particularly bitter pill to swallow.

For me, Copenhagen demonstrated that if we are to maximise our impact on climate change, California needs to actively promote widespread adoption of those policies that it has proved to work, while at the same time continuing to serve as a policy lab for those initiatives still in need of refinement. For too long we have attempted to convince emerging economies of the efficacy of policies that remain largely unproven and the cost of which remain unknown. Instead we can and should be leading by example. Only when we can demonstrate that addressing climate change does not mean forgoing economic development can we expect emerging economies to accept meaningful limits on carbon emissions.

Getting Back in the Game: Canada, Climate Change and the Low Carbon Challenge[1]

Dahlia Stein, Canada

At the 13th Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Bali in 2007, I was stopped by a delegate in the hallway of the conference centre in Nusa Dua where the COP was held and asked, when they discovered I was Canadian: "But what has happened to Canada?"

There is some bewilderment over the perceived change in Canada's position from leader to laggard. Indeed, one could argue that Canada's recent history with regard to climate change as being a movement backwards. In 2005, Canada was President of the COP11 in Montreal, working actively to ensure the Kyoto Protocol was formally launched and brokering a deal to begin a new dialogue including the USA and China.

Domestically, the federal government had begun implementing 'Project Green', a plan to help Canada meet its Kyoto target and had just declared six greenhouse gases as 'toxic' under the Canadian Environmental Protection Act, giving it the legal authority to implement emissions reductions regulations for large industry and create a cap-and-trade system. It had passed what was called, "the greenest budget in Canadian history" (by the Leader of the Green Party, no less!) and had set in place a new agency to buy billions of dollars of emissions reductions credits.

Yet since 2006, Canada has been among the top recipients of the 'Fossil of the Day' awarded to countries viewed as impeding international action against climate change by the Climate Action Network (an umbrella group of about 500 environmental non governmental organisations working to "limit human-induced climate change to ecologically sustainable levels"). Awarding my country one of its many Fossil of the Day awards in October, 2009, CAN said: "Canada is now the only country more focused on finding creative ways to hide their emission increases and make their weak targets look ambitious than solving the climate crisis.[2] Canada has been referred to by international observers as 'the new Saudi Arabia'.

[1] The opinions expressed in this article are those of the author and do not necessarily represent the positions of Health Canada or the Government of Canada.

[2] CAN Fossil of the Day, October 2009 at Bangkok climate talks, http://www.fossiloftheday.com

At home, a new government has dismantled most of the previous administration's climate programmes, later reintroducing some as re-branded initiatives, often at lower funding levels or with no climate-specific objectives. Support for clean energy technology is mostly limited to fossil-fuel or nuclear industries, while the primary remaining programme supporting renewable energy is fully subscribed and has not been extended beyond 2011, despite billions of dollars in new stimulus spending. A March 2010 report by the Pembina Institute comparing Canadian and American federal investments in renewable energy and energy efficiency found that the USA (not heretofore considered a leader in climate change initiatives itself!) is set to outspend Canada nearly 18:1 per capita on renewables, and more than 8:1 per capita overall on clean energy programmes and projects.[3]

The federal government has proposed three different climate change plans over the past four years, each one dropped as soon as the perceived electoral need subsided, and the current position of the Canadian government essentially is to align as closely as possible with whatever the USA does (or doesn't do).

Performance under pressure

Yet despite these obvious changes in Canadian policy since 2006, it is interesting to note that in terms of Canada's actual emissions, its performance has been fairly consistent regardless of which government was in power, how strongly they endorsed or condemned the Kyoto Protocol, and promoted or delayed action to fight climate change.

According to Canada's most recent National GHG Inventory, published in April, 2009, GHG emissions have risen 26% between 1990 (592MtCO_2-eq) and 2007 (747MtCO_2-eq), which puts Canada almost 34% over its Kyoto target of 6% below 1990.[4]

Note: A temporary reduction of GHGs between 2004–06 (from 741 to 718MtCO_2-eq) has been attributed to warmer winters, changes in some petroleum extraction activities and changes in the mix of sources used for electricity production.[5] There has been no analysis of whether these changes were in any way related to industry's reaction to government policy at the time, although they do coincide with a more activist federal government on climate change between those years.

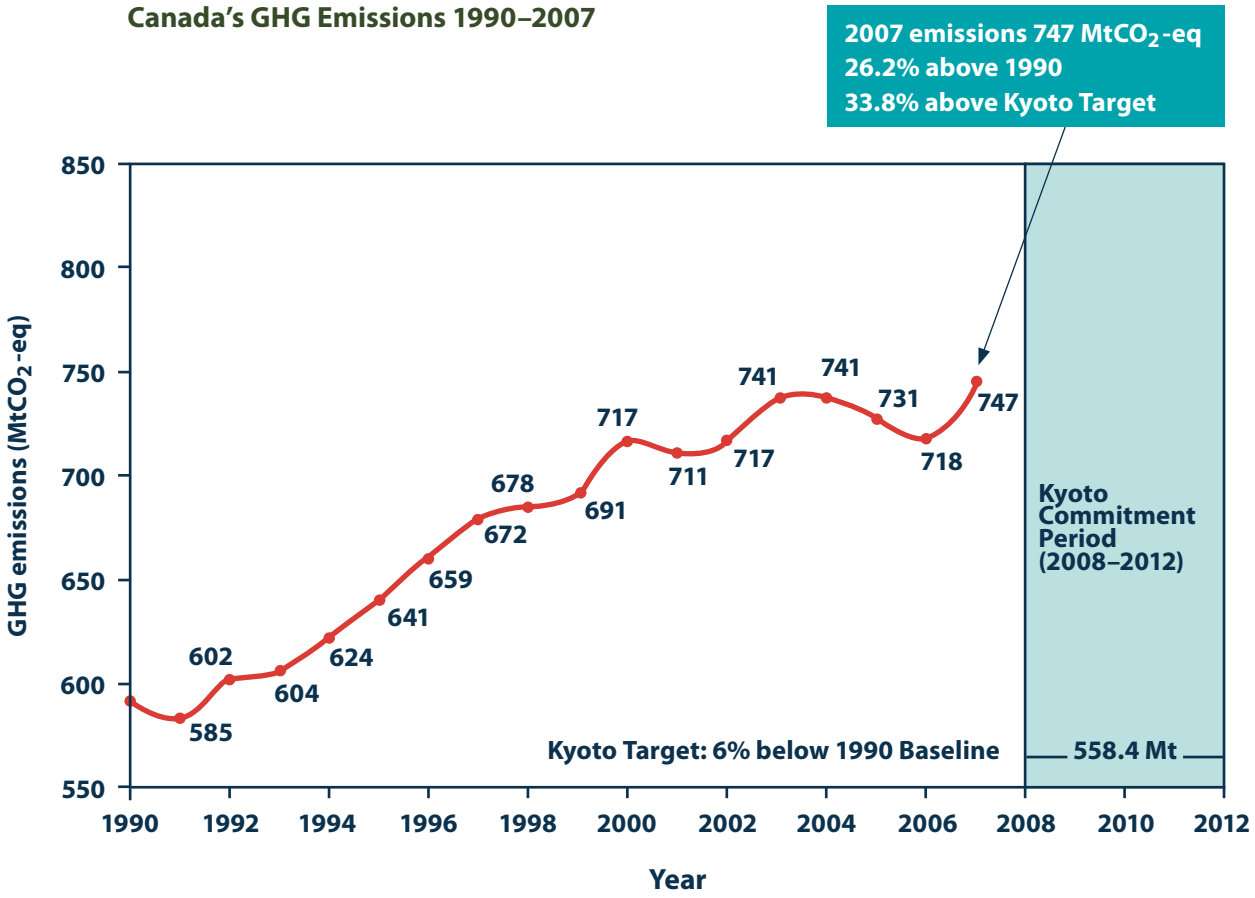
The short-lived 2004–06 reduction aside, GHG emissions have grown significantly since 1990, driven primarily by increased coal electricity generation, more motor vehicles, and higher oil and gas production—much of it for export.

Interestingly, between 1990 and 2006, emissions intensity fell by about 21%, (in similar ranges to the USA, India, Germany and

[3] The Pembina Institute: 'Canada falling even further behind the US in sustainable energy investments per capita', March 11 2010

[4] Canada's 2007 Greenhouse Gas Inventory, published April 2009

[5] ibid



France). But emissions per capita in Canada are still among the highest in the world, with Canadians emitting 22.5 tonnes of CO_2-eq in 2005, almost double the OECD average, while the Chinese, for example, emitted 6 tonnes. For further context, USA citizens emitted about 22 tonnes per capita, and the world average is about 7 tonnes.[6]

So in terms of reducing emissions, Canada has a long way to go. And despite some good initiatives at the provincial level and in some municipalities, Canada still has no nationwide carbon price, no federal regulatory system for emissions, and very few policy signals indicating to industry that low carbon investment is the winning option for the future.

[6] Conference Board of Canada, 'How Canada Performs',http://www.conferenceboard.ca/hcp/details/environment/greenhouse-gas-emissions.aspx and CRS Report for Congress, RL34659: 'China's Greenhouse Gas Emissions and Mitigation Policies', September 10 2008

How did we get here?

In considering why Canada stagnates at its current state of (non)performance, it is useful to consider the motivations of other developed countries which have taken more action, such as the UK or European Union. From discussions with UK and EU officials, analysts and observers over the course of the Chevening Fellowship at Cambridge University, it seems clear that the primary impetus for their action is three-fold:

- concern about the potential impacts of climate change on their countries;
- concern about energy security, as fossil fuel importers who will need to meet energy needs facing 'peak oil' conditions; and
- desire to maintain competitiveness in a low carbon economy which they are convinced is where the future of economic development lies.

One could argue that the motivating factors for serious climate change initiatives in most other developed countries are missing in Canada.

Effects of climate change

While Canada will certainly feel the effects of climate change, these effects may not be universally negative for a cold, northern country with a large landmass and small population.

Average temperature in Canada has increased about 1.2°C over the last 50 years, and this increase is even more pronounced in the Arctic. Arctic melting is affecting permafrost, making northern communities and transportation routes unstable, harming wildlife habitat (including the iconic polar bear), and further stressing the traditional way of life of aboriginal peoples. We are seeing more extreme weather events, such as ice storms, floods, hurricanes and droughts. New insect- and vector-borne diseases are affecting resources (the pine beetle wiping out forests in British Columbia) and people (over the past decade we have seen the emergence of West Nile Disease in Canada).

Yet, while scientists predict some serious effects, higher temperatures will also open new economic development opportunities in the north, making resource exploitation more economic, and opening new trade routes across the Arctic. With longer growing periods, Canada's agriculture could be boosted. Areas of the country that have been inhospitable to humans could become more liveable. When it's 30 degrees below zero, global warming doesn't sound so bad!

So while the effects of climate change are significant, ambiguity about the overall impact could lead people to feel there is just as much reason to be hopeful as there is to be gloomy about a warmer future. Furthermore, as an advanced developed country, Canada can be expected to manage adaptation better than some other countries might, so concerns about resilience, infrastructure, and so on don't necessarily resonate any more because of climate issues than they otherwise would.

And of course, the current concerns about climate change science are having an effect on public opinion that cannot be underestimated. It's hard to convince people they need to do something to avoid climate change impacts if a significant percentage of them think there is insufficient reason to believe there will be any impact at all.

Energy security is in the eyes of the beholder

While clearly an important driver for most European countries, energy security has a very different meaning for an energy-exporting country.

Canada has vast energy resources, being endowed with both fossil fuels (primarily in the west) and hydropower (in the east). In fact, Canada was the fifth largest producer of energy in the world in 2006, with total energy production increasing by 87% since 1980, while total energy consumption increased by only 44%.[7] One does not detect the same sorts of fear of peak oil in Canada as one hears in Europe.

A more common view can be seen in the approach of the Canadian Association of Petroleum Producers, which notes that in a world of rising energy demand, finding reliable additional energy supply will become increasing difficult and expensive. (Of course a vendor will have a different perspective of 'expensive' than a buyer!) Accordingly, companies will look to fill the supply–demand gap with more complicated or unconventional fossil fuel sources, such as oil sands. Environmental challenges can simply be addressed with new innovations and technologies, if required. While paying lip service to alternative sources of energy (renewables) the logic assumes the status quo will continue and that fossil fuels will remain the primary source of energy in the future.[8] There is no serious debate about 'peak oil' in Canada.

While manufacturing, financial and other services are still greater contributors to Canada's total GDP, the energy sector is an important and growing part of Canada's economy in terms of investment, trade, income generation (accounting for almost 7% of GDP), and employment (approximately 280,000 jobs).[9] Statistics Canada concluded in its most recent *Canada Year Book* that over the past 5 years, Western Canada had displaced Central Canada as the driver of national economic growth.[10] (It is interesting to note that the headquarters of most oil and gas companies are clustered in Alberta, which is also the political power base of the current government.)

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[7] US Energy Information Administration, Country Analysis Brief, July 2009

[8] Canadian Association of Petroleum Producers, 'Our Energy Challenge', http://www.capp.ca/energySupply/ourEnergyChallenge/Pages/default.aspx#K6RJ6DfElVNS

[9] The Energy Council of Canada, 'The Energy Economy in Canada,' 2007, http://www.energy.ca/users/folder.asp?FolderID=2500

[10] Statistics Canada, *Canada Year Book Overview 2008*, Economic Accounts, http://www41.statcan.gc.ca/2008/3764/ceb3764_000-eng.htm

Virtually all of Canada's exports of oil, natural gas and electricity, and 85% of its uranium exports go the USA.[11] When you include energy-intensive goods, equipment, etc., the importance of energy in Canada's trade balance is even greater. And of course, Canada's economy as a whole is closely integrated with that of the USA, with approximately 80% of exports going to the USA and 65% of imports coming from there.

Therefore, energy security to a country like Canada means maintaining market access for our energy products. And our most important market is the USA, which didn't sign on to the Kyoto Accord. Anyone can do the math: Canada's greatest perceived economic opportunities (and threats) are tied to the world's largest GHG-emitting economy, whose industries have faced no climate-related restrictions.

Rather than, "how did we get here?", the real question, moral issues aside, might well be the following: why should Canada be a participant in the fight against climate change, let alone a leader?

But of course, to understand Canada's wider national interest requires a broader perspective.

A broader perspective

Canada is a relatively small, open economy, dependent on trade for much of its GDP and quality of life. In terms of international relations, Canada is a 'middle power' which benefits from a well-functioning multilateral system (to counter-balance the 'elephant' to the south).[12] Canada has a proud history of participation in international peace-keeping initiatives and is an active member of a number of military alliances (NATO, NORAD, etc.). Canadians have generally viewed their country as an 'honest broker' in the international community, able to punch above its weight diplomatically in part because of a perceived integrity and moral decency (we have no history of imperialism, slavery, never started a war, etc.).

A country built on immigration, Canada has strong, politically active immigrant communities across the country. An aging population will have significant effects on Canada's ability to maintain its health care and pension systems, and many have suggested that additional immigration (primarily of people who will be productive additions to the workforce) is required if these programmes are to be maintained.[13]

In addition to Canada's love-hate relationship with the USA, it feels a traditional affinity to the countries across the Atlantic from whence

[11] 'The Energy Economy in Canada', 2007, op. cit.

[12] Previous Canadian Prime Minister Pierre Trudeau once referred to Canada's close relationship with the USA as analogous to sleeping with an elephant: "No matter how friendly and even-tempered is the beast... one is affected by every twitch and grunt."

[13] See, for example: Foot, David K., 'Some Economic and Social Consequences of Population Aging', IRPP, October 2008

many of its founding peoples came; it has strong ties across the Pacific, a more recent source of its citizens; and it is an Arctic country, something that looms large in its sense of identity.

Canada has embraced globalisation (albeit with some trepidation) and its people have fairly widespread access to information and communications technology. For example, Canada has the highest broadband subscription rate among the G8 countries.[14] Economic growth over the past decade has been largely due to earnings from resources – exports of oil, natural gas, metal ores and alloys, and potash. While still important to Canada's GDP, since the early 2000s, the goods producing sector has been shrinking as a proportion of Canada's economy, and manufacturing has been stagnant or declining since 2005. Without the energy sector in 2007, Canada would have had a trade deficit with the world.[15]

The real national interest

Given these characteristics, a true assessment of Canada's national interest should lead to different conclusions about the threats posed by climate change.

As a country that is inextricably linked to, and benefits from, a stable international system, we cannot assume that we will be immune to international instability due to climate effects. One can see how increased immigration flows and pressures, new international conflicts, additional need for foreign aid and other implications of climate change will put immense pressure on our ability to flourish as a nation, even if we can manage adaptation to climate change on our own soil, which will involve huge costs and dislocations in any case.

As a country that likes to think of itself as a good international citizen, whose people proudly sew Canadian flags on their backpacks when traveling abroad so others don't confuse us with Americans, will we be comfortable with an international reputation as a rogue state? Many Canadians feel passionately that as one of the world's richest nations we have an obligation to help those less fortunate – especially if our actions are exacerbating their misfortune.

As an Arctic country, we will be on the front lines of a new frontier – one that is eyed hungrily by other world powers. Earlier this month, a Chinese Rear Admiral reportedly asserted that the Arctic belongs to all peoples.[16] While we have a respected and effective military, it's hard to see how a country of thirty or so million people could take on the militaries of the USA, China or Russia. Canada cannot win in a race to militarise the Arctic, so will the new Arctic trade passages, and newly accessible hydrocarbons in the continental shelves under the Arctic make us the new Panama or Iraq? At the very least, Canada will need to divert massive amounts of investment

[14] *Canada Year Book Overview 2008*, op. cit.

[15] ibid

[16] Byers, M., 'China is coming to the Arctic', *Ottawa Citizen*, March 29 2010

to build new ports, search and rescue and policing services across the vast north in order to maintain its sovereignty.

And of course, from an economic perspective, environmental harm has real economic costs, and environmental goods and services offer real economic opportunity. The very strength of Canada's resources and natural capital in contributing to its current economic health becomes a weakness as the ecological goods and services that our economy relies on (stable climate, clean air and water, biodiversity, food, energy, raw materials) deplete. Fossil fuels are in fact non-renewable, no matter how much ingenuity we can apply to their extraction.

It seems obvious that the longer term sustainability of the Canadian economy depends on innovation – not only in more sustainable resource extraction, but in energy efficiency, in reducing pollution and maintaining our natural capital, and in developing 'green' or 'clean' technologies in a variety of sectors from energy supply to buildings to transport to agriculture.

Economic opportunity – and risk

Even with a lack of consistent policy direction at the federal level, the environmental goods and services sector has been one of the fastest growing sectors of the Canadian economy over the past decade.[17] Studies show green investments (energy efficiency, renewables, etc.) can create millions of new jobs, and often proportionately more jobs than the same investment in conventional energy.[18]

This is where the real opportunity lies, especially given the structure of the Canadian economy with its inherent weaknesses.

And the opportunity is immense. Canada may not have made the decision yet that a low carbon, resource efficient future is inevitable. But many other countries – both developed and developing – have, as evidenced in part by the massive investments in 'green stimulus' that they have made in response to the recent economic downturn.

A 2009 study by Roland Berger Strategy Consultants concludes that the clean energy technology market is already larger than the pharmaceutical industry worldwide, and forecasts it will be the third largest industrial sector in the world in 2020.[19]

The respected Conference Board of Canada concluded in March 2010 that the global market for climate-friendly technologies and services is "exploding", yet Canadian companies are failing to take advantage of these global opportunities.[20] It points out that global

[17] Sustainable Prosperity, 'Building A Green Economic Stimulus Package for Canada', 2009

[18] ibid

[19] Roland Berger Strategy Consultants, 'Clean Economy, Living Planet: Building Strong Clean Energy Technology Industries', WWF-Netherlands, November 2009

[20] Conference Board of Canada, Goldfarb, D., 'Global Climate-Friendly Trade: Canada's Chance to Clean Up', March 2010

climate-friendly trade as a whole accounted for more than $200 billion (Canadian) in 2008, or about 25% of total global non-agricultural or natural resources trade. Although still small in relative terms, the sector has shown double-digit growth in recent years.[21] Given the impressive growth potential of this sector, there is clearly an opportunity cost if Canada fails to compete.

Yet while world trade in GHG-reducing technologies grew by 10% on average each year, Canadian exports stagnated between 2002–08, and imports grew only slowly.[22] But the news is not all bad. The same Conference Board study concludes that: "Canada's vast geography, energy intensity, and valuable resource base provide a major comparative advantage in developing related climate-friendly technologies. For example, Canadian companies would have natural strengths in developing energy-, water-, mining-, or telecommunications-related climate-friendly technologies. These sources of natural strength present important opportunities for Canada to become a leader in climate-friendly technologies."[23]

For further perspective, the federal agency that supports clean technology reported in March 2010 that up until the global financial crisis in 2008, the Canadian clean technology sector experienced eight years in which it was the fastest growing area of venture capital investment year over year. And even though these investments declined between 2008–09, as did most others in the circumstances, investments in the sector were still greater than in other sectors including software, biotech, or any other category.[24]

At an international level, despite ongoing uncertainty about the global economic situation, spending by the world's biggest companies to develop or acquire cleantech solutions is "robust and primed to accelerate", according to a November 2009 Ernst & Young survey of more than 300 corporate executives worldwide.[25]

So the opportunity is evident. And so is the risk. As trading partners and competitors go low carbon, Canada could be left behind. The risk is two-fold: not only could we miss out on new opportunities, but Canadian companies could be subject to trade barriers against our carbon-intensive or fossil fuel exports by countries who are taking action to limit their own carbon. The California low carbon fuel standard that could make oil sands

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[21] ibid

[22] 'Global Climate-Friendly Trade: Canada's Chance to Clean Up', op. cit.

[23] ibid

[24] Russell Mitchell Group for Sustainable Development Technology Canada, '2010 SDTC Cleantech Growth and Go-To-Market Report', March 2010

[25] Ernst & Young, 'Cleantech matters. Going big: the rising influence of corporations on cleantech growth. Global cleantech insights and trends report 2009–2010', November 30 2009

fuel ineligible for sale in that state is an early possible example.

Both government and the private sector have important roles to play in ensuring that Canada is not left behind in the global shift to a new economy.

Policy signals to spur change

From a federal perspective, the most important thing the Canadian government could do is provide a clear policy signal that it intends to do its utmost to mitigate climate change, while preparing for the adaptation that is already beginning to be required both at home and around the world. It must be clear that a low carbon future is not only inevitable, but beneficial and that so-called environmental 'externalities' will have an explicit price in future.

While it may not like all of the necessary policies, the private sector says it wants certainty in order to make business decisions and government's primary job is to provide that certainty in order to spur the major investments in energy, transportation, manufacturing, etc. that will be needed to transform the economy.

Much has been written on the policies that are needed to spur Canada's transformation to meet the low carbon challenge. No one policy tool will do the job, and a mix of initiatives will be required. These mirror the types of policies identified elsewhere,[26] including:

- a nationwide carbon price and market (tax, cap-and-trade, or both);
- support for low carbon technology/ renewables (including removing barriers to dissemination and commercialisation where they exist);
- better building codes, fuel- and energy-efficiency standards, etc. to reach the areas of the economy that a carbon price cannot;
- conserving the boreal forest (an immense carbon sink that stores twice the carbon of tropical forests);[27] and
- public education, information and motivation to change behaviour.

Key considerations

A final comment on two key factors to be considered in the Canadian context:

1. Given the decentralised nature of the Canadian federation, and the constitutional division of powers between the provincial and federal governments, there is a particular need for careful federal–provincial coordination. Provincial authority over key policy areas such as natural resources and electrical power

[26] See for example, Stern, N., *The Economics of Climate Change, The Stern Review*, Cambridge University Press, 2007; recommendations by Canada's National Roundtable on the Environment and the Economy; The Conference Board of Canada; Sustainable Prosperity; IRPP; The Pembina Institute; Sustainable Development Technology Canada; the 2008 platform of the Liberal Party of Canada, etc

[27] Carlson, M., Wells, J., Roberts, D., *The Carbon the World Forgot: Conserving the Capacity of Canada's Boreal Forest Region to Mitigate and Adapt to Climate Change*, Boreal Songbird Initiative and Canadian Boreal Initiative, 2009

generation and distribution means that no solution that involves energy can be designed without provincial involvement.

The provinces vary greatly in terms of their resource bases, energy sources and distribution, with for example, Quebec getting almost all of its electricity from hydro, while Alberta gets almost all from coal. They also vary in their climate-related activities to-date. A number of provinces have already taken some action (carbon taxes or equivalents in British Columbia, Quebec and Alberta; strong feed in tariffs for renewables in Ontario, etc.) and there will be repercussions if they are required to vacate the policy space in the face of more robust federal action.

So there is a need to ensure a country-wide carbon price and policy while balancing the burden across provinces with very different energy and economic bases, and at very different starting points. This will not be easy, but should not be insurmountable in a country used to the delicate balancing of federal and provincial relations on a wide range of issues.

2. As discussed above, the close integration of the Canadian and USA economies means that any changes to the business environment must be cognisant of potential trade or competitiveness effects. And given the existence of a legal trade framework under the North American Free Trade Agreement (NAFTA), some have suggested that a continental approach to addressing climate change is required. Authors Henrik Selin and Stacy VanDeveer have argued that rather than building three (or more) separate markets, creating a continent-wide carbon market would capture efficiency opportunities and lower transaction costs.[28] While a North American market may look rather ambitious at the moment, there is no doubt that some coordination will be needed in order to reduce GHGs effectively, efficiently and with the fewest possible trade distortions or negative economic consequences.

Since the most innovative efforts to mitigate carbon emissions to-date come from North American states, provinces, and municipalities, a more activist federal policy framework will need to coordinate both bilateral and subnational efforts. Federal policy could be designed to set a ceiling – or floor – for provincial and state policies and provide a region-wide market with comparable parameters. (Obviously, I'll have to do a fellowship in Washington, D.C. to pursue this further!)

Conclusion

The conclusion that it is not in Canada's best interest to take strong climate action is clearly a symptom of the 'short-termism' that infects many sectors of society, from business to media to government. It reflects a number of factors, not least of which is the power of

[28] Selin H., VanDeveer, S.D., *Continental Climate Governance Challenges for North America*., Issues in Governance Studies, No. 30, The Brookings Institution, December 2009

vested interests over our understanding of real national interest.

This short-term view is exacerbated by the current lack of confidence in the climate science. But, as David Hone, International Climate Change Advisor for Shell said quite convincingly when he met with the CPSL Chevening Fellows, while the science cannot give us complete certainty about the impacts and risks, if the probabilities are anywhere near the range currently indicated by the best science, then rational people should view these risks as unacceptable. We will have to act before we are completely sure of the outcome because if we wait, it will be too late.

Fundamentally, the unsustainable practices that make climate change (and other environmental degradation) so difficult to combat result from a misinterpretation of the relationship between the economy and the environment. The old view that one must be 'balanced against' the other is flawed. In fact, the economy cannot exist without the environment.

As people have begun to understand that a despoiled environment has serious effects on economic and social well-being, we have seen some limited examples of the needed transformation. We will need to accelerate and expand these examples to protect the climate, our natural capital, our economic opportunity and our society. It remains to be seen whether Canada will internalize this fact soon enough to get 'back in the game' in the transition to a healthier, low carbon future. Let's hope it can make this transition in time to do its part in fighting global climate change while gaining the economic and social benefits that a low carbon future offers.

Fellows

Brer Adams
Senior Manager
Utilities and Climate Change Group
Macquarie Capital
Australia

Dr Paulette Bynoe
Director
School of Earth and Environmental Sciences
University of Guyana
Guyana

Upik Sitti Aslia Kamil
Head
Sub-Division for Climate Change Mitigation in Energy Sector
Ministry of Environment
Republic of Indonesia

Augusto Townsend Klinge
Chief Analyst of Semana Económica
APOYO Publicaciones
Peru

Aloisio L.P. de Melo
Director
Agricultural Policy
Ministry of Finance
Brazil

Cristian-Marius Moisoiu
Advisor
Government of Romania
Romania

Stephen N. Mutimba
Managing Director
Camco
Kenya

Brad Page
Chief Executive Officer
Energy Supply Association of Australia
Australia

Marisol Rivera Planter
Statistical Analysis and Econometric Modelling Director
National Institute of Ecology
Government of Mexico
Mexico

Samir Saran
Senior Fellow and Vice President
Observer Research Foundation
India

Andrew Schwartz
Senior Energy Advisor to President Michael Peevey
California Public Utilities Commission
USA

Travis Sinckler
Senior Environmental Officer
Ministry of Environment, Water Resources and Drainage (Environment Division)
Government of Barbados
Barbados

Dahlia Stein
Head
Stakeholder Engagement Office
Safe Environments Dictatorate
Healthy Environments and Consumer Safety
Bureau
Health Canada
Canada

Raymond Yuantang Yu
Director, EU & Benelux Affairs
Department for European Affairs
Chinese Ministry of Commerce (MOFCOM)
China

Maria Zhevlakova
Director
NGO OSEKO
Russian Federation

Acronyms

10YFP	10-Year Framework of Programmes
ADB	Asian Development Bank
BAU	business-as-usual
BCA	border carbon adjustment
BNDES	National Bank of Economic and Social Development (Brazil)
BRIC	Brazil, Russia, India, and China
BSFG	Barbados Sustainable Finance Group
BTA	border tax adjustment
$BtCO_2$-eq	billion tonnes carbon dioxide equivalents
CAN	Climate Action Network
CAP	Common Agricultural Policy
CARICOM	Caribbean Community and Common Market
CCS	carbon capture and storage
CDM	Clean Development Mechanism
CEPS	Centre for European Policy Studies
CERs	certified emissions reductions
CGE	computable general equilibrium
CH_4	methane
CO_2	carbon dioxide
CO_2-eq	carbon dioxide equivalents
COP	United Nations Conference of the Parties
CPSL	University of Cambridge Programme for Sustainability Leadership
CRU	University of East Anglia's Climatic Research Unit
CSR	corporate social responsibility
DSB	WTO Dispute Settlement Body
EC	European Commission
ES	ecosystem services
ETS	emissions trading scheme
EU	European Union
EU-ETS	European Union's Emissions Trading Scheme
EVN	economic value to the nation
FCO	Foreign and Commonwealth Office
FSC	Forest Stewardship Council
G20	Group of Twenty Finance Ministers and Central Bank Governors
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GHG	greenhouse gases
GOB	Government of Barbados
GRIF	Guyanan REDD-plus Investment Fund
GSP	Generalized System of Preferences
GtC	gigatonnes of carbon dioxide
$GtCO_2$-eq	gigatonnes carbon dioxide equivalents

HDI	human development index
IEA	International Energy Agency
IEPR	Integrated Energy Policy Report
IFPRI	International Food Policy Research Institute
IISD	International Institute of Sustainable Development
IMF	International Monetary Fund
INE	National Institute of Ecology (Mexico)
INSSE	National Institute of Statistics (Romania)
IPCC	Intergovernmental Panel on Climate Change
IPR	intellectual property rights
IRB	Brazilian Reinsurance Institute
IUCN	International Union for Conservation of Nature
kgoe	kilogrammes of oil equivalent
kWh	kilowatt hour
LCDS	Low Carbon Development Strategy
LULUCF	Land Use, Land-Use Change and Forestry, a section of the Kyoto Protocol
MEA	multilateral environmental agreement
MEWD	Ministry of Environment, Water Resources and Drainage (Barbados)
MFN	most favoured nation
MOFCOM	Ministry of Commerce (China)
MoU	memorandum of understanding
MRV	measurable, reportable and verifiable
$MtCO_2$-eq	million tonnes carbon dioxide equivalents
MW	megawatts
NAFTA	North American Free Trade Agreement
NAMAs	Nationally Appropriate Mitigation Actions
NATO	North Atlantic Treaty Organization
NGO	non-governmental organisation
N_2O	nitrous oxide
NORAD	North American Aerospace Defense Command
NSP	National Strategic Plan
NSTE	National Sub-Committee on Trade and Environment
NTFPs	non-timber forest products
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
ORF	Observer Research Foundation
OTC	over the counter
PECC	Special Programme on Climate Change (Mexico)
PES	payments for ecosystem services
ppm	parts per million
PPM	production and process method
PPP	purchasing power parity
PPS	purchasing power standard
PROPER	Performance Industry Rating Program

REDD	Reducing Emissions from Deforestation and Degradation
REDD-plus	REDD mechanism including enhancement of forest carbon stocks
R&D	research and development
Rs	rupees
SFB	Serviço Florestal Brasileiro
SIDS	Small Island Developing States
SMEs	small and medium enterprises
tCO_2-eq	tonnes of carbon dioxide equivalents
TEEB	The Economics of Ecosytems and Biodiversity United Nations study
TEN-T	Trans-European Transport Network
TNA	technology needs assessment
UN	United Nations
UN DESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations International Children's Fund
VERs	verified emissions reductions
WCMC	World Conservation Monitoring Centre
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

The University of Cambridge Programme for Sustainability Leadership (CPSL) works with business, government and civil society to build leaders' capacity to meet the needs of society and address critical global challenges. Our seminars and leadership groups and our partnerships with those who make or influence decisions are designed to transform public and private sector policies and practices and build greater understanding of our interdependence with one another and the natural world. Our Network of alumni brings together the most influential leaders in the world who share an interest in and a commitment to creating a sustainable future.

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Designed and produced by Advantage Design Consultants
+44 (0)20 7613 3933 | www.advantagelondon.com

In the UK:
1 Trumpington Street,
Cambridge CB2 1QA, UK
T: +44 (0)1223 768850
F: +44 (0)1223 768831
E: info@cpsl.cam.ac.uk

In Brussels:
48 Rue de Stassart
1050 Brussels
T: + 32 (0)2 894 9320
E: info.eu@cpsl.cam.ac.uk

In South Africa:
PO Box 313
Cape Town 8000
T: +27 (0)21 469 4765
E: info.sa@cpsl.cam.ac.uk

In Australia:
Level 5, ACA Building
118 Queen Street
Melbourne VIC 3000
T: +61 (0)3 96 42 0220
E: info.aus@cpsl.cam.ac.uk

In the United States:
3440E Spruce Street
Seattle, WA 98111
T: +1 (206) 792 9984
E: info.usa@cpsl.cam.ac.uk