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The Road to Rio+20

For a development-led green economy

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Readers of the first volume of essays in the series the 'Road to Rio+20' will recall that the collection looked back at the origins and possible approaches to the 'Green Economy'. It debated its possible impacts on trade, the economy and development and gave voice to those who support and those who are not convinced or oppose the concept. Further, it assessed potential outcomes and illustrated the path of one country towards green solutions to low carbon dependency, economic growth and employment.

The present volume, rather than responding to the questions of 'what?' and 'why?', is primarily concerned with the question 'how?'. It provides a series of real world references for governments, businesses and civil society; what we refer to in this volume as '[pathways to a development-led green economy](#)'. Questions of the validity of 'green economy' concept as a motor for development, contested in the previous series, are illustrated here by national and corporate experiences, and by insights from research.

This issue also addresses gaps in implementation with one essay providing a 'historical perspective' tracing four decades of high and low points in the frequently contentious and acrimonious environment and development debate. It argues that that the debate's main themes are as current today as they were 40 years ago.

What are potential pathways for governments to enable the Green Economy in accordance with their development

priorities? A number of essays in this volume attempt to respond, at least in part, to that question, for example, by discussing the kind of support policies and investment levels needed. Others sound a cautionary note in their analysis of why governments predisposed to a green agenda have nevertheless failed to match goodwill with performance. One essay argues that governance for a green economy should be based on the 'think global, act local' model, where people see tangible results within their community, city, region or state such as green job creation from green initiatives enacted through sub-national authorities.

For some authors, [Rio+20](#) will provide a historic opportunity to promote a new green growth model, technical innovation, and job creation, working to enhance not only GDP but critical social and environmental objectives as well. [Rio+20](#) is also expected to provide new trading opportunities, not only for green goods and services but more broadly for all products integrating sustainability and fair trade criteria. People and consumers, it is generally agreed, are prepared to pay more for products when they know that its producers in developing countries are not being subjected to a 'race to the bottom' in competitive pricing but, on the contrary, that they are being correctly compensated.

A number of major obstacles exist, most notably access to green finance, especially in the current economic climate, with some authors identifying the need to create a large-scale climate finance network.

The lack of access to credit in developing countries with rich untapped energy potential condemns them to remain in the fossil fuel trap. Some authors see trade liberalization and open markets in renewable technologies as a means of driving down energy costs, along with a credible pipeline of projects to lure investors.

A possible response may be a [development-centred approach](#), with the role of business, the innovator, clearly distinguished from that of government, the enabler. The approach entails seizing opportunities from strategic partnerships and novel financing mechanisms to develop renewable technologies, notably wind and solar, alternative fuels, or as in one essay presents, compost-based fertilizers created from city waste.

As for green business models, the Clean Revolution is seen as a means of achieving economic, environmental and social sustainability through smart, clean, low-carbon technology and new profitable business practices. In the largely optimistic but balanced view of the green economy outlined in this volume, it is nevertheless recognized that environmental goals will require a shared vision of a better future by political, business and civil society leaders.

A [Rio+20](#) consensus that is fair, inclusive and disallow green protectionism can become a driver in support to the enabler (governments) and the innovator (business) and pave the way for a better future for civil society.

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The green economy and developing countries: towards a development-centred and inclusive transition

Supachai Panitchpakdi

I

In December 2009 the United Nations General Assembly adopted a decision to organize the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012. The Conference seeks to secure renewed political commitment for sustainable development, assessing progress to date and remaining gaps in the implementation of the outcomes of the major conferences on sustainable development, and addressing new and emerging challenges. Specifically, the Conference will examine how a global transition to a green economy can help us manage our global commons and meet the challenges before us. It is widely anticipated that the Rio Conference will reaffirm Principle 12 of the 1992 Rio Declaration on Environment and Development, and Chapter 2 of Agenda 21 to build a supportive and open global green economy, and consider proposals to advance their implementation.

Now, with the 2012 Rio Conference just months away, it is important to reflect on why sustainable development is such a defining issue of our time; what constitutes a green economy in the context of sustainable development and poverty eradication; and how such an economy can help us address the urgent environmental, social and economic problems we face. It should be emphasized that the concept of a green economy itself remains unclear for many. Moreover, some governments have concerns that a transition to a green economy may not generate net gains

for their countries. While the debate over the development prospects of a green economy continue, it is clear that a transition to a green economy must be carefully designed and managed so that it is able to generate gains for all, across and within countries.

UNCTAD believes that the Rio Conference provides a critical opportunity for all countries, developed and developing alike, to define and shape a green economy that can attract wide interest by generating new investments, income sources and jobs among countries of varied levels of development. Ideally, the Conference will elaborate a plan of action defining actors, actions, responsibilities and an effective institutional framework in order to advance an inclusive and development-led green economy. This article aims to present what we at UNCTAD believe are key issues and considerations that need to be taken into account in the Conference deliberations. It argues that sustainable development is an imperative rather than an option; describes the role of states and markets in a transition to a green economy; highlights the role of trade in advancing a green economy; and examines developing countries' need for technical and financial assistance. In concluding, ideas are suggested on what UNCTAD can do to help developing countries secure development gains from a green economy.



Sustaining human development and advancing social goals

The introduction of modern technologies in the mid-1800s ushering in the industrial revolution extended the frontier of human development by improving living standards for a growing world population. Social benefits include improved access to food, water, energy, transportation, housing, health and education services, and, closing the circle, the economic growth and employment opportunities their production provides. However, with ever increasing levels of fossil fuel and natural resource consumption needed to accelerate and spread the benefits of our technological revolution, we now recognize that in recent decades human development has pushed the planet as a whole past limits of environmental stability. This is resulting in adverse global change: a warmer more volatile climate, stressed water supply, land degradation, depleted forests, and scarcities of the natural resources needed to continue fueling our modern society. These and other emerging environmental problems now impose significant and increasing stress on social and economic systems, limiting our ability to advance national and international development goals. Neglecting to effectively manage pollution, waste and over-consumption of natural resources is no longer an option. Moreover, when considering roles and responsibilities in redressing global environmental problems, it is important to take into account equity concerns both among and within countries and in relation to their current and historical contribution to environmental degradation and excessive resource use.

As a society we thus face a major challenge: finding a way to continue to advance social development while ensuring that the global commons can be sustained to the benefit of current and future generations. How can society meet this challenge? Some have argued that we should moderate economic growth. But this is not an acceptable option. Why? Because economic growth to reach higher levels of world output is required both to meet the consumption needs of a growing global population and to create much needed jobs and reduce poverty for the world's poor. Others have suggested that we manage population. However, already at existing population levels current production and consumption patterns are environmentally unsustainable. Technological progress and an active developmental state to increase resource efficiency thus emerges as a critical way to achieve the objective of sustaining

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continued economic and population growth while at the same time decreasing the adverse externalities of future production and consumption processes.

A key thrust of the green economy concerns unlocking technological progress. Not for its own sake, but to stabilize natural and environmental systems so that economic and social objectives can continue to be advanced. It aims to identify and promote new approaches to stimulate and diffuse technological progress to steer our economy towards an economically, socially and environmentally sustainable trajectory. It is not only about hard technologies – the equipment and hardware we use to produce goods and services – but also about the soft technologies – the production processes and consumption patterns we adopt in our economies and lifestyles.

Importantly, to become politically and economically viable, the green economy must represent much more than simply green washing the global economy. Beyond improving the economy's environmental performance and sustainability, the green economy must be development-led whilst addressing current social and economic imbalances within and among countries. It should improve living standards across and within countries by generating new employment opportunities for the poor and enhancing their access to basic services such as energy, water, housing, transportation, communications, healthcare and education. It calls therefore for an active developmental state committed to enabling a more equitable transition to a green economy.

The green economy also seeks to be inclusive. All countries urgently need 'green' technologies to combat climate change, preserve biodiversity, reduce pollution and conserve natural resources wisely. And all countries require the economic growth and jobs that the green economy will promote going forward. No population group should be marginalized from a full and beneficial participation in a global green economy.

Certainly most would agree that prompt and effective actions need to be taken by the international community as the world economy struggles with acute environmental and natural resource constraints. And although countries have varied capacities to respond to the challenges of sustainable development, all share a vision that our global commons must be effectively managed so that the needs of current and future generation can be met. At the same

time, state and private actors must mount an increasingly effective response to global challenges not as an act of altruism, but to protect their shared interest in preserving the global commons in order to sustain their own national social and economic prospects; both public and private. Building on this momentum, the Rio Conference aims to reaffirm political commitment for urgent action and strengthened international cooperation to ensure an inclusive green economy transition that is truly global in scope. In other words, Rio+20 should open the door for a new era of development-led globalization, which effectively addresses current environmental, economic and social imbalances.

Stimulating the green economy transition

It is evident that a successful transition to a development-led and inclusive green economy will not be automatic. Establishing effective frameworks to durably support the development of the green economy will require reforms at the national and international levels. National policies and actions are needed to stimulate and mature green economy markets, while at the international level, institutional structures are required to ensure developing countries derive attractive benefits from engaging in a global transition. The latter must therefore provide for effective technology transfer, financial assistance and safeguarding of market access to new green markets as well as continued access to existing markets as they become greener going forward.

At the national level, an active role for the state emerges as critical in ensuring an accelerated and fair transition. Governments have regulation and incentive-based instruments as levers to promote the transition in their domestic economies. Direct support will also be essential in the early stages of a transition, including through grant and subsidy support to green technology research and development activities, and to productive activities in green goods and services sectors. In addition, government procurement can ensure a base market needed to sustain green start-up industries. Government support for a green economy is already a reality. In 2009 almost USD 200 billion of green stimulus spending – in the form of subsidies and government procurement – began to be disbursed globally in 2009 and by early 2010, over 100 countries, developed and developing, had some policies in place to promote the use and dissemination of renewable energy.¹ Finally, beyond regulation and incentives, information dissemination campaigns to facilitate the choices of consumers and businesses will also be essential in enabling the transition.

While policies and actions are needed at the national level to design and drive a green economy transition, they are also essential at the international policy level to steer the transition and spread it globally. The latter requires addressing significant challenges facing many developing countries that lack sufficient financial, technical and

human capital needed to structurally transform their economies. To fill these gaps, international cooperation will be essential in providing capacity building, facilitating technology transfer and coordinating financial assistance.

Whatever international mechanisms may be agreed upon to support the transition to a green economy, they must refrain from imposing new conditionalities on, and distortions in international trade, development cooperation and financial assistance. They should also avoid imposing a 'one-size-fits-all' template that fails to account for countries' different starting points and diverse development priorities. Furthermore, international economic and environmental agreements must provide developing countries with sufficient flexibility to sequence and implement rules and modalities that will be adopted.

The Conference will recognize that countries are at different levels of development and will therefore move towards the green economy transition at different speeds. Thus, in accordance with the Rio principles, any agreed approach on how to move forward should offer countries appropriate levels of international support to help build their financial, technical and human capacities and their need to advance at different paces, respecting their level of development.

The trade dimension

No one country is positioned to supply all of the goods and services needed in a green economy. Trade thus has a unique and central role to play in ensuring an inclusive transition to a green economy. By bridging national markets, trade facilitates the diffusion of green goods and services across borders. While trade allows countries to import green products that are not produced domestically in sufficient quantity, it also allows countries to accrue export gains for those green products that they produce competitively.

Indeed a green economy transition is already underway and this is reflected in markets. At the firm level, Corporate Social Responsibility (CSR) reporting, which includes environmental as well as social equity concerns, is now practiced by over 2,000 corporations in over 90 countries; a figure up from virtually zero at the time of the 1992 Rio Summit. Moreover, the number of firms with ISO 14001 environmental management certification rose from under 40,000 in 2000 to over 200,000 from over 150 countries in 2009; and over 40 per cent of registered firms are in developing countries.² The move towards environmental management by private and state firms parallels momentum towards a green economy transition that is evident from market trends in a wide range of sectors such as energy, agriculture, forestry and services among others.



Within the energy sector, global growth rates in renewable energy sources contributing to world primary energy supply now greatly exceeds growth rates in fossil fuel based energy sources. Since 1990, annual growth in solar, wind and biofuel supply capacity has averaged 42, 25 and 15 per cent respectively, compared to the rate of only 1.3 per cent for oil.³ The increase in renewable energy capacity is reflected in recent investment trends. In 2010, USD 211 billion was invested in renewable energy supply, more than 5 times the amount invested in 2004.⁴ And for the first time, developing countries surpassed developed countries in new spending on utility-scale renewable energy projects and provision of equity capital for renewable energy companies; USD 72 billion was invested in developing countries versus USD 70 billion in developed economies.

As within the energy sector, production in the agriculture and forestry sectors is also greening. The global market for organic food and beverage products is projected to reach USD 60 billion this year; a more than three-fold expansion from 2000 levels. Organic farming is practiced on 37 million hectares in 160 countries; a nearly four-fold increase over the past decade. Increases in organic farmland are occurring predominantly in developing countries to respond to growth in demand in developed country markets. Developing countries are also increasing their presence in sustainably harvested timber products markets. Globally, forest land area certified by the Forestry Stewardship Council has increased seven-fold over the past decade to reach nearly 140 million hectares in 2010, with developing countries' share of this total rising to about 20 per cent.

Momentum towards a green economy is also present in the services sector. Ecotourism is projected to capture 25 per cent of global tourism revenues in 2012, with international tourists spending USD 240 billion in ecotourism destinations the majority of which are in developing countries. Cross-border investments in green economy activities are also on the rise. Over the past decade, the global carbon market has grown from infancy to become a major world market today. Its value rose from only USD 11 billion in 2005 to USD 142 billion in 2010. Much of this market, USD 120 billion, involves emissions trading among developed countries, but CDM projects in 81 developing countries supported investments worth USD 20 billion in 2010.⁵

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Recognizing the dynamic growth of nascent green economy markets, firms in both developed and developing countries are pursuing expanded export opportunities for green goods such as efficient and renewable energy technologies, cleaner production technologies, sustainably produced agricultural, biodiversity including timber and fisheries products, as well as for green services such as ecotourism. Given the wide variety of goods and services emphasized in a green economy, developing countries should be able to identify export opportunities for green goods and services for which they have comparative advantages in production and implement strategies to enhance productive capacity in relevant sectors.

Trade volumes of environmental goods and services are expected to grow substantially, in a dynamic way with an annual growth rate exceeding that of world trade.⁶ Combined with growing demand from industry and consumers, the global market in low-carbon and energy efficient technologies is projected to nearly triple from USD 800 billion today to USD 2.2 trillion in 2020, implying global annual market growth 11 per cent from 2010-2020. This could provide developing countries with many new export opportunities, however, they require capacity-building assistance to identify opportunities they are well-placed to seize and build their respective export capacities.

And while it is already clear that trade can transmit green economy benefits among countries, it is also evident that current trade patterns will be impacted in various ways in a greening global economy. The green economy may pose threats to market access for developing countries due to changes in the global marketplace. Such changes include greening national regulation, standards, government procurement, industrial policy, private standards and buying patterns of consumers.

Specifically, national policy reforms designed to support a green economy may lead to the introduction of stringent environmental and social standards that restrict imports of many 'brown' goods currently exported by developing countries. Such restrictions could include bans on non-complying products and border carbon adjustments (BCAs) that impose 'taxes' on imports based on the environmental footprint of their production and transport. At the same time, the multiplicity of private standards in the market makes it difficult for consumers to make informed consumption choices. Improved, transparent



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and harmonized information for consumers could thus increase access to green markets by small developing country producers and enhance overall eco-efficiency of consumption. International cooperation will be essential to support developing countries seeking to sustain and deepen their participation in world trade, not only for goods and services that are inherently 'green' but more generally for all goods and services that are progressively becoming 'greener'. Provisions providing differential treatment for developing countries, including adequate adjustment periods for meeting new green standards in international trade, will be essential.

Countries' national industrial policies to promote a green economy by providing domestic firms with grants, subsidies and favorable treatment for taxes and government procurement can also reduce developing country market access. While the potential impacts of a greening global economy on trade can be clearly identified, it is not clear to what extent they will give rise to new forms of green protectionism. However, there are already initial indications that concerns over green protectionism are emerging in some key markets. For instance, Japan and the EU have raised objections to Canada's (Province of Ontario) requirements for domestically produced renewable energy equipment in its feed-in tariff programme, and the United States has raised concerns about China's subsidies that support domestic producers of wind turbines. The potential for conflict between governments' national policies to support a green economy and its multilateral trade obligations strongly suggests that a transition will have to be effectively managed at the international level to prevent and resolve conflicts that may emerge. If not, genuine and legitimate efforts to promote a more sustainable and responsible green economy can be impaired by commitments made in other spheres of global economic policy.

International cooperation could help countries identify and adopt innovative and constructive approaches to resolving potential conflicts before they become trade restricting and worsen into a trade dispute, and importantly, before economic damage occurs. Towards realizing this goal, a mechanism for international cooperation on trade-related green economy challenges could be established through a solution-oriented 'Forum on Green Economy and Trade'. This Forum could serve as a round-

table for technical discussions on focused issues by a broad range of stakeholders, including governmental and non-governmental representatives. The Forum would not be a formal negotiation venue but rather a platform for science-based discussions aimed at building consensus and greater coherence between trade policy and green economy initiatives. Sessions would be convened regularly and would be demand-based addressing topics reflecting the expressed interests of member states. Forum topics would be announced well in advance to allow the fullest participation of interested stakeholders.

By reframing discussions from conflict resolution to conflict prevention, the Forum could serve a pre-emptive function reducing the burden of cases seeking formal arbitration. It would aim to provide the best possible information to governments, corporations, civil society, general public, and international organizations on the issues that either cause or have the potential to generate conflict between parties in the transition to the green economy. As a key objective, the Forum could identify areas of common understanding to reduce the need for parties to seek mediation or formal dispute settlement. Rather than finding solutions to compensate a complainant, the Forum could enhance the ability of the parties involved in trade-related green economy conflicts to find cooperative approaches towards their resolution. For example, enhanced financial and capacity-building support could be provided to developing countries affected by new green standards to enable them to meet such standards, or specific subsidy support provided to firms in high-income countries could be predicated on those firms including a share of developing country content in their supported green technology R&D or production activities.

At the Rio Conference, the international community could explore ways to help developing countries preserve their market access in a greening global economy, and to explore options to strike a balance between allowing countries sufficient policy space for industrial policy needed to support their beneficial transition to a green economy and creation of new markets therein. Equally important, the Conference should examine how to protect developing countries from the threat of new green protectionism, including through constructive consensus-building mechanisms.

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The central role of technology

Since technological progress is the motor of a green economy, prompt and effective technology transfer will be critical in promoting a global green economy transition. UNCTAD's Technology and Innovation Report of 2011 identifies key issues in renewable energy technologies and innovation capacity in developing countries with a clear focus on sustainable development and poverty reduction. While best available technologies need to be improved upon, and new technologies developed, to ensure environmentally sustainable growth going forward, we need not wait for improved technologies to accelerate progress on sustainable development. Even with today's state of technological development a lot can be done to improve the environmental performance and limit the material intensity of production and consumption activities. Over the short-term there is an immediate need to more widely disseminate best available technologies for cleaner and more efficient production and consumption. Concerted policy support is required to enable natural innovation, transfer and adoption of these technologies, given their greater efficiency in resource use and contribution to sustainable development.


A key industrial sector of the green economy is renewable energy equipment and production. According to a joint report by Bloomberg New Energy Finance and UNEP, this sector received investments amounting to USD 211 billion in 2010, or 1.5 per cent of all investments reported in that year. The forerunners in capital attraction were wind and solar power, however, to achieve production efficiencies both rely on economies of scale which lie beyond productive capacities of most but not all developing countries. Indeed a number of emerging economies have increased their presence in renewable energy industries. Renewable energy technologies such as solar panels and wind turbines are among the manufactures seeing the sharpest rise in production. Developing countries have made significant progress in supplying global markets for these products; their share of world exports increased from 20 per cent in 2002 to 53 per cent in 2009.⁷ China is now the world's biggest producer of solar photovoltaic panels. Similarly in the wind power market, China is the world's top producer of wind turbines followed closely by India in third place. In the biofuels market, developing countries account for over 40 per cent of world bioethanol production and 12 per cent of world biodiesel production. Top

producers are Brazil, China, India, Colombia, Republic of Korea, Thailand and Malaysia.

There is an expanding opportunity for a wider group of small and medium-sized players in developing countries to participate in value chains for renewable energy technologies as large producers seek to attain economies of scale in production, reduce costs and access untapped markets.⁸ As a result, developing country suppliers, especially from Asia, are increasingly providing products along the value chain, a trend expected to grow. Although these developments are positive, increased developing country capacity will not flow automatically. Production and manufacturing possibilities need to be steadily augmented by a policy environment that promotes the accumulation of knowledge and capacity building in order for developing country firms to upgrade and progress technologically. Failing this, there is always a risk that a large number of firms in developing countries will be entrenched at the lower ends of global manufacturing chains, as can be witnessed in the case of other sectors such as ready made garments and electronics.

As the green economy creates higher levels of demand for environmental technologies in developed and emerging economies, it is driving down prices. This is allowing developing countries to benefit from more affordable access to renewable energy systems that can bring electricity to rural areas where the majority of developing country populations live. Solar and wind energy systems can also be effectively commercialized in poor rural communities to provide jobs in manufacturing-related hardware and distribution, installation, and maintenance. There are now numerous programmes supported by international organizations, donor agencies and NGOs to bring low-cost and efficient renewable energy systems to the rural poor in developing countries. For example, supporting 250 independent local retailers in Africa, the Rural Energy Foundation has successfully commercialized solar home systems in Burkina Faso, Ethiopia, Ghana, Mali, Tanzania, Uganda, Senegal, Mozambique and Zambia. In Bangladesh, the Grameen Shakti organization has successfully introduced a market-based approach that has sold over 500,000 solar home systems in the country over the past decade. In these and other countries, renewable energy systems are bringing power, light, water, refrigeration,





information and communications to homes, schools and small businesses, improving the quality of life and opening new business opportunities for the rural poor while boosting economic productivity in their communities.

Beyond energy, access to green technologies is important to decouple economic growth from harmful patterns of resource use, improving people's livelihoods and moving to more sustainable growth paths. Of special interest to developing countries, agriculture could benefit from advanced seeds and efficient field machinery that generates more rural income and improved food security, at the same time allowing higher yields from lower quality farmland. Moreover, technology also plays a major role in enhancing energy and material efficiency from better industrial engines, materials that improve thermal efficiencies of buildings, and less resource-intensive packaging technologies.

How can green technology transfer be accelerated? Developing countries remain disadvantaged since most of them lack the sophisticated regulatory and institutional frameworks, as well as the business environments, needed to attract technology transfer. Developed country governments also have limited power to promote technology transfer since they do not often have direct ownership over technologies. The powerful player in this field is the private sector, which not only develops and owns technologies, but also spearheads research and production capacities to propagate them.

In developing countries, private agents transfer technologies predominantly via licensing agreements, joint R&D initiatives, through the establishment of manufacturing plants, via corporate mergers and acquisitions, public-private partnerships, as well as through capacity-building initiatives. However robust technology transfer occurs more often towards countries that already have a number of macroeconomic and institutional conditions in place, such as rule of law, good governance and institutional robustness, financial and regulatory stability as well as the existence of intellectual property rights (IPR) protection systems and national capacity to absorb new technologies. Also important is the ability of consumers to pay for final products; a limiting factor in the transfer of clean technologies used in providing energy and water services to low-income populations. In addition, licensing agreements with non-OECD countries are generally limited to larger, higher income developing countries, leaving a large number of countries without access to important technologies.

Indeed, because insufficiently strong investment and business climates narrow prospects for green technology transfer, supportive financial and technology transfer mechanisms are needed to offer tangible opportunities for less advanced and less diversified economies to leap forward.

The Rio Conference will certainly recognize that developing, absorbing, adapting and diffusing green technologies requires strengthened international cooperation and collaboration on research and development. Green technology transfer will certainly benefit from experience gained through the United Nations Framework Convention on Climate Change (UNFCCC) process. In 2012 the UNFCCC will launch a Climate Technology Mechanism to facilitate the implementation of enhanced action on technology development and transfer in order to support developing country action on mitigation and adaptation to climate change. The Conference could identify ways to extend international cooperation on technology R&D in other sustainable development areas not closely related to climate change. It may also encourage the introduction of policy incentives for technology transfer in both developed and developing countries, and improvements to the dissemination of information on available green technologies.

Additionally, the Conference could explore options to increase flexibility in the global intellectual property regime for green technologies. Given the global public-good character of climate change mitigation, consideration could be given to interpreting the flexibilities of the WTO Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS Agreement) in a way that would allow compulsory licensing for the production of equipment and goods that embed climate-friendly technologies, and for related processes, similar to the exemptions accorded for medicines in support of public health⁹. Increased flexibility could include broadening the scope of compulsory licensing for essential green technologies; limiting the duration of patent protection; and allowing more liberal use of existing patented knowledge to generate new innovations.

This flexibility will be critical to enhancing the dissemination of future green technologies that will be protected by IPRs. But it should be recalled that many current green technologies such as solar cells, wind turbines and hydro-turbines are not IPR protected; their dissemination is limited by difficulties in attracting domestic and foreign investment due to lack of technical capacity to absorb and adapt new technologies, unfavorable domestic business environments, and limited access to finance. Indeed, in many cases, it is easier to attract foreign investment in technologies that are IPR protected than those which are not as investors often seek secure guarantees for exclusivity in the commercial activities their investments support.

Financing for developing countries

Although developing countries' access to new, additional and innovative sources of financing to support their transition to the green economy is a sine qua non condition, developed economies are finding their treasuries

under significant pressure. This means that new green economy finance cannot rely solely on official grants and development aid. It should also include public-induced private investment. It has been widely reported the accumulated cash reserves of private corporations are at historically high levels. The Federal Reserve Bank of the United States reported this year that cash available to corporations reached 1.3 trillion dollars in 2010; a massive amount of resources looking for new investment opportunities. A key priority for developing countries interested in attracting foreign investment in green projects and sectors is to create a conducive domestic policy environment consistent with the country's own green economic objectives while at the same time avoiding protectionist schemes.

It is important to recognize that due to the differences in institutional development, resource endowment, and human capital, there will be countries that have little or no ability to attract private investments towards green projects and sectors; these countries should be the primary targets for new and additional official financial support.

What mechanisms can be envisaged for new funding from official sources? While there has been no dedicated work to date on financing mechanism for the green economy, the High-level Advisory Group on Climate Change Financing (AGF) established by the UN Secretary-General provides a useful example how governments can induce private investment in global sustainability activities. The AGF looked into potential funding sources for climate change mitigation and adaptation activities. It concluded that it is challenging but feasible to meet a goal of mobilizing USD 100 billion per year by 2020. It recognized that funding will need to come from a wide variety of sources, public and private, bilateral and multilateral, including through the scaling up of existing sources and increased private flows. Grants and highly concessional loans are crucial for adaptation in the most vulnerable developing countries, such as the least developed countries (LDCs) and small island developing states (SIDS). The AGF further recognized that key elements of financial flows would be mutually reinforcing. It concludes that careful and wise use of public funds in combination with private funds can generate truly transformational investments.

Strong national mitigation commitments coupled with the introduction of new economic instruments based on carbon pricing (e.g., carbon taxes or emissions permits) are important for mobilizing climate financing. Instruments based on carbon pricing are particularly attractive because they both raise revenue and provide incentives for mitigation actions. The AGF emphasized the importance of a carbon price in the range of USD 20 - USD 25 per ton of CO₂ equivalent in 2020 as a key element of reaching the USD 100 billion per year (carbon prices in August 2011 were in the range of USD 14 to USD 17). The higher the carbon price, the steeper the rise in available revenues

and the stronger the mutual reinforcement of abatement potentials and different mitigation measures. Revenues collected in developed countries can be used to fund international financing mechanisms.

Actual estimates of 2020 revenue potential for new public instruments are sensitive to many assumptions, particularly carbon price and the share allocated to international climate finance. Based on a carbon price of USD 20 - USD 25 per ton of CO₂ equivalent, auctions of emission allowances and domestic carbon taxes in developed countries with up to 10 per cent of total revenues allocated for international climate action could potentially mobilize around USD 30 billion annually. An additional USD 10 billion annually could be raised from carbon pricing international transportation, assuming no net incidence on developing countries and earmarking between 25 and 50 per cent of total revenues. Up to USD 10 billion could be mobilized from other instruments, such as the redeployment of fossil fuel subsidies in developed countries or some form of financial transaction tax, though diverging views might make it difficult to implement the latter universally.

Direct budget contributions based on existing public finance sources, such as domestic revenues, could continue to play an important role, as governments may prefer to increase direct budget contributions before they implement new instruments. However, the political acceptability of direct contributions will depend on national circumstances and on the domestic fiscal environment, which is under extreme pressure in many developed countries currently experiencing high levels of public debt. Nevertheless, direct budget contributions are expected to play a key role in the long term.

Some green economy domains in which developing countries require financial assistance are green technology transfer, climate change mitigation and adaptation, biodiversity conservation, mitigation of desertification, export capacity development in green sectors, capacity-building on international standards (e.g., green economy related SPS, TBT and private standards), and assistance on mainstreaming green economy policies into national economic, employment and trade policies. Within each of these areas a number of important initiatives have already been planned and designed following extensive negotiations. To promote the participation of developing countries in the transition to a green economy, the Rio+20 Conference should take account of and build upon these initiatives to provide developing countries with financial support for environmental activities.

Some mechanisms, such as the Global Environment Facility or GEF (currently allocating USD 1 billion/yr to environmental activities in developing countries), the CDM (which supported investments worth USD 20 billion in 2010 in 81 developing countries) and the Aid-for-Trade initiative coordinated by the UN are already being successfully or partially implemented. Others, such as the

recently announced UNFCCC Green Climate Fund (expected to provide about USD 15 billion to developing countries in 2012 and scaling up to USD 100 billion/yr by 2020), will soon be operational. The Conference should aim to consolidate these mechanisms into an eventual roadmap or plan of action to accelerate an inclusive green economy transition.

Whatever international mechanisms may be agreed upon to support the transition to a green economy, it is important that they refrain from imposing new conditionalities on, and distortions in international trade, development cooperation and financial assistance. They should also avoid imposing a 'one-size-fits-all' template that fails to account for countries' different starting points and diverse development priorities.

Ways forward from the perspective of UNCTAD

Discussions at the Rio Conference will need to identify effective approaches to accelerating the transition to an equitable, inclusive and development-led green economy. Approaches will necessarily need to be comprehensive yet practical to ensure an internationally managed transition that promotes and supports the participation of developing countries, whilst preventing the use of possible new forms of "green" protectionism. Based on its mandate and areas of comparative advantage, UNCTAD stands ready to support countries in their transition to a green economy. With a view towards developing practical tools and generating new insights to ensure trade and development benefits accrue to developing countries in the transition to a green economy, UNCTAD is exploring possibilities to:

✎ *establish a forum for international cooperation on trade-related green economy challenges.* As described above, a Forum on Green Economy and Trade would provide consultation and information exchange

services to governments by reframing discussions from conflict resolution to conflict prevention;

✎ *launch a demand-driven technical assistance programme that responds to increasing demand for green economy capacity building.* Activities within UNCTAD's programme would be designed to assist interested developing countries and regional bodies to identify their comparative advantages for the production and export of specific green goods and services with dynamic growth trends. The programme would provide a methodology to support trade analyses and both national and regional interactive reviews of economic, regulatory, institutional and trade policy factors related to enhancing productive capacities in green sectors of national and regional interest;

✎ *organize a multi-year expert meeting focused on examining critical green economy issues of importance to developing countries.* Over a 4-year period, UNCTAD's multi-year expert meeting would support innovative approaches to a green economy by promoting open intergovernmental discussion on a wide range of topics selected by member states, and by serving as a vehicle for the exchange of best practices, national experiences and success stories. Among others, topics could include: the design of national and regional policy frameworks to support green economy activities; ways to enhance international cooperation on technology transfer; leveraging finance for technology transfer; trade implications of greening agriculture, manufacturing and services sectors.

UNCTAD stands ready to further develop these proposals and looks forward to its participation in the preparatory discussions and the Rio Conference itself with a view to advance the consideration of practical approaches in support of a development-centered transition to the green economy ◀

Endnotes

- 1 UNCTAD, 2011, Technology and Innovation Report, Renewable Energy Technologies for Sustainable Development.
- 2 ISO, 2009, The ISO Survey.
- 3 IEA, 2011, IAE Database.
- 4 UNEP, 2011, Global Trends in Renewable Energy Investment 2011, see also UNCTAD Technology and Innovation Report 2011, Chapter 2, p. 26.
- 5 World Bank, 2011, State and Trends of the Carbon Market 2011.
- 6 HSBC Global Research, 2010, Sizing the Climate Economy.
- 7 See UNCTAD, 2011, Technology and Innovation Report: Renewable Energy Technologies for Sustainable Development, chapter 3, box 3.3.
- 8 UNCTAD, 2011, Technology and Innovation Report: Renewable Energy Technologies for Sustainable Development.
- 9 UNCTAD, 2009, Trade and Development Report: Responding to the Global Crisis, Climate Change and Development.



Supachai Panitchpakdi

Dr. Supachai Panitchpakdi, whose first four-year term as Secretary-General of UNCTAD began on 1 September 2005, was appointed to a second term by the General Assembly in July 2009. His second term runs from 1 September 2009 to 31 August 2013. He previously served as Director-General of the World Trade Organization and as Thailand's Deputy Prime Minister and Minister of Commerce. As Deputy Prime Minister, he was in charge of the country's economic and trade policy-making, signing the Uruguay Round Agreement in 1994 and contributing to the formulation of regional agreements. Dr. Supachai received his Master's in Econometrics, Development Planning and his Ph.D. in Economic Planning and Development from Erasmus University in Rotterdam.

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Not since the industrial revolution has our global economy undergone such a massive change... however, this break from the past aims to be inclusive and provide benefits for all levels of society –in developed and developing countries

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Photovoltaic solar power farm in Jumilla, Murcia, Spain (38°29'N, 1°19'W)
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Towards a green economy: moving from concept to reality

Achim Steiner

II

Achim Steiner presents the latest evidence on the green economy moving from concept to reality, and highlights the impacts that are already being seen in some areas, such as energy. Drawing on the recent findings in UNEP's Green Economy Report, he illustrates how an investment of two per cent of world GDP can help accelerate a global transition to a green economy across a range of key sectors, provided governments create the right enabling conditions. He sounds a note of optimism, stating that, as governments, businesses and civil society identify their perspective routes, "we can all be hopeful because this common goal is truly within our grasp".

Not since the industrial revolution has our global economy undergone such a massive change – one that is just at its infancy in innovation and development of new green technologies, which will help us build a new, low-carbon, resource-efficient and more equitable society. From sustainable food production to renewable energy, a green economy offers us an alternative to the fossil fuel and consumption-driven society that we live in today.

Unlike the industrial revolution of the 19th century, however, this break from the past aims to be inclusive and provide benefits for all levels of society – in developed and developing countries. It will also, therefore, have a net positive impact on efforts to alleviate poverty.

This remarkable economic shift has not come about by chance. Some countries, such as the Republic of Korea and South Africa, have already begun to realize tangible benefits from adopting smart public policies and enabling conditions to support a green economy transition in some of their key sectors. Others, like Barbados and Indonesia, have been more ambitious, adopting national strategies and plans that create a framework for facilitating this change across their society.



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A green economy: values
and invests in natural capital;
...and, grows faster than a brown
economy over time
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The private sector is also attuned to this revolution and, as a result, more forward-looking companies are already shifting their business strategies towards a green economy. Nowhere is this shift more evident than in the energy sector. In 2010, a total of 22 countries, including Brazil, China, India and Morocco all reported growth in their photovoltaics (PV) markets. Globally, 17.5 GW of PV were installed, which represented an increase of 130 per cent, and outstripped even the most optimistic forecasts of banks and energy experts. According to IMS Market Research, more than 30 countries will be part of this emerging solar revolution by 2015.

Moreover, considerable manufacturing capacity of PV has also come on stream, which has halved costs over the past two years, and prices are set to halve again this year. Meanwhile, solar plants, large and small, are proving faster to set up compared with other energy technologies. A nuclear power plant can take 10 to 15 years to build and a coal-fired power station around five years. One leading solar plant manufacturer recently reported that the time from receiving an order for a 5MW to 10MW PV installation to having it up and running is as little as three months.

The International Energy Agency (IEA) estimates that, to achieve universal access to electricity by 2030 in order to meet a UN system-wide goal, additional investments in the power sector will need to be around USD 33 billion a year. Much of this investment will have to be targeted in sub-Saharan Africa, where currently 585 million people still have no access at all. This is not such a substantial sum when you consider that in 2010, the 6.5 GW of PV installed above the original forecasts already represented about USD 32 billion. And this was just for solar energy: multibillion dollar investments also flowed into new wind energy schemes and geothermal installations.

Recently, the Intergovernmental Panel on Climate Change (IPCC) published its summary for policymakers underlining that, with the right kind of public policies, renewable energy could deliver close to 80 per cent of total world energy supply by 2050.

Earlier this year, UNEP's Green Economy Initiative, in collaboration with many partners, published an analysis

outlining the benefits that investing two per cent of global GDP across 10 key sectors could achieve—again backed by enabling policies. The conclusion in the report was that the sum, equating currently to an average of around USD 1.3 trillion per year, would grow the global economy at around the same rate, if not higher, than those forecast under business-as-usual models. However, it would do this without the rising risks, shocks, scarcities and crises increasingly inherent in our existing 'brown' economy.

The findings challenge the misconception that there is an inescapable trade-off between environmental investments and economic growth. The findings show that transitioning to a green economy is not only relevant to more developed economies but can also serve as a key catalyst for growth and poverty reduction in developing ones too, where in some cases close to 90 per cent of the GDP of the poor is linked to nature or natural capital such as forests and freshwaters.

Investing in key economic sectors will not only deliver real economic, environmental and social benefits, it can also help reduce risks. Continuing a business-as-usual approach to water is projected to lead to a large and unsustainable gap between global water supply and water withdrawals, which can only be addressed by investments in infrastructure and water policy reform. Such policies can also have a ripple effect in other areas. For example, Cambodia, Indonesia, the Philippines and Viet Nam are currently losing the equivalent of two per cent of their combined GDP as a result of water-borne diseases due to inadequate sanitation. By adopting policies to address the water and sanitation challenges, these countries would generate savings while improving water efficiency and health.

UNEP's Green Economy Report draws on a growing body of evidence that makes the case for a new economic paradigm – one that results in *improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive.

However, to make the transition to a green economy, specific enabling conditions will be required. These enabling conditions consist of national regulations,

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It is crucial for countries
to combine and balance
environmental protection
with safeguarding market
access

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policies, subsidies and incentives, and international market and legal infrastructure; and, trade and aid protocols. At present, enabling conditions are heavily weighted towards, and encourage, the prevailing brown economy, which, inter alia, depends excessively on fossil fuel energy. Price and production subsidies for fossil fuels collectively exceeded USD 650 billion in 2008, which adversely affects any incentives for transitioning to renewable energies.

It is clear that we cannot afford to continue in a business-as-usual mode any longer. Ecological scarcities are seriously affecting key economic sectors, including fisheries, forestry and freshwater, which are the bedrock of human food supply and a critical source of livelihoods for the poor. Today only 20 per cent of the commercial fish stocks, mostly of low priced species, are underexploited; 52 per cent are fully exploited with no further room for expansion; about 20 per cent are overexploited; and, eight per cent are depleted. Water is becoming scarce and water stress is projected to increase with water supply satisfying only 60 per cent of world demand in 20 years. Agriculture saw increasing yields primarily due to the use of chemical fertilizers, which have reduced soil quality and failed to curb the growing trend of deforestation – remaining at 13 million hectares of forest per year during 1990-2005.

The UNEP report, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*, makes the case for investing in fundamentally new ways to run our economies and industries. It shows that a green economy: values and invests in natural capital; plays a key role in poverty alleviation; creates jobs and enhances social equity; substitutes renewable energy and low-carbon technologies for fossil fuels; promotes enhanced resource and energy efficiency; delivers more sustainable urban living and low-carbon mobility; and, grows faster than a brown economy over time, while maintaining and restoring natural capital.

For example, today, natural capital is undervalued and often mismanaged, resulting in billions of dollars of losses to national economies each year. Biodiversity and the services provided by ecosystems, such as forests, wetlands and river basins, must be seen as assets and essential natural capital. In Brazil, where the government has included these natural goods and services

on their balance sheet, the national GDP increased from 6 per cent to 17 per cent.

Greening agriculture in developing countries, particularly in the small farm sector, could contribute to increased farm yields and improved ecosystem services. Typically, organic farming is more labour intensive and can thus generate up to 30 per cent more employment than conventional farming. In Uganda, organic agriculture took hold in 1994 and, by 2004, had 45,000 certified farmers. This jumped to 206,803 certified farmers in 2007 and represented exports worth USD 22.8 million.

Work undertaken by UNEP and the International Labour Organization (ILO) makes it clear that “green jobs” refer to both environmental soundness and decent work. The latter implies jobs that offer adequate wages, safe working conditions, job security, reasonable career prospects and worker rights. The joint *Green Jobs Report* of 2008 highlighted the excellent potential for green job creation in sectors such as recycling, renewables, building and construction, pulp and paper, forestry and organic agriculture. This work is now being updated and expanded for release early next year.

We are aware of certain industries where there is high potential for greening operations but evidence of significant risks of substandard working conditions. One example is the treatment and recycling of e-waste, where health and safety standards require special attention as we seek to take the greening opportunities at hand. Of all the waste streams, that from electrical and electronic equipment containing new and complex hazardous substances presents the fastest growing challenge in both developed and developing countries. Improvements, through a green economy approach, could result in effectively full recycling of e-waste from a current estimated level of 15 per cent.

A decoupling and green transformation of economies at the national level may involve introducing more efficient technologies, shifting to more manufacturing or services, and more material-intensive imports/exports. In the process, jobs may be created, substituted, eliminated or transformed, but governments need to prepare for these trends by ensuring that appropriate educational and training programmes are in place.

Developed countries' citizens consume an average of 16 tonnes per year of key resources (minerals, ores, fossil fuels and biomass) per capita, a figure that goes up to 40 or more tonnes per person in some developed countries... the average person in India today consumes only four tonnes per year

Business and industry needs to prepare by doing the same, whilst running open processes of social dialogue between management and employees. Both business and government also need to consider how alternative models, such as extended product life cycles, could create new job opportunities through extended value chains that include maintenance, repair and recycling, including related activities such as the collection and sorting of used products and reverse logistics.

The need to address social problems such as poverty, job creation and equity, whilst promoting environmental sustainability, raises the challenge of decoupling. A new report by UNEP's Resource Panel highlights trends in our ability to decouple economic growth from both resource use and damaging environmental impact. It also shows growing discrepancies between the developed and developing world. Developed countries' citizens consume an average of 16 tonnes per year of key resources (minerals, ores, fossil fuels and biomass) per capita, a figure that goes up to 40 or more tonnes per person in some developed countries. By comparison, the average person in India today consumes only four tonnes per year.

Despite advances in technology and urban renewal over the last century, in absolute terms total resource use grew eight-fold, from six billion tonnes in 1900 to 49 billion tonnes in 2000. This is largely due to population growth, continuing high levels of consumption in the industrialized countries, and increased demand for material goods, particularly in China, India, Brazil and other rapidly emerging economies. As a result, total resource use is now estimated at up to 59 billion tonnes. Thus, the Resource Panel has warned that decoupling is occurring, but "at a rate that is insufficient to meet the needs of an equitable and sustainable society."

However, reasons for optimism lie in the possibility, for example, for developing countries, unburdened by existing technologies, to move to less resource-intensive processes and goods. Response strategies require a focus on technology innovation, as well as new models of doing business and conducting lifestyles, especially in urbanizing cities where greater population intensity offers economies of scale to make substantial resource efficiency improvements. This places special responsibility on developed nations, which may have to put

limits on per capita resource consumption. In as far as developed economies advance structural change towards becoming service economies and export their resource use to developing economies, consideration can be given to trade liberalization and development aid as ways of off-setting these exported ecological impacts.

Trade-related measures, such as standards, can play an important role in driving growth in a number of green-ing sectors. Such measures could also be perceived by countries as a challenge to market access or a form of trade protectionism. It is therefore crucial for countries to combine and balance environmental protection with safeguarding market access. Standards and labels can play a key part as forms of self-regulation and disseminators of relevant knowledge to use the dynamic of the market to transform business operations and consumer behaviour. In recent years, national eco-labelling schemes have been initiated in Brazil, China, India, South Africa, Indonesia, Thailand and Tunisia.

The current WTO Doha Round negotiations offer the opportunity to promote a green economy. A successful conclusion of these negotiations could contribute to a green economic transition. For example, negotiations are currently focused on the removal of fisheries subsidies, which often contribute directly to overfishing. Another opportunity exists with respect to the current negotiations aimed at reducing tariff and non-tariff barriers on environmental goods and services. A World Bank study found that trade liberalization could result in a 7 to 13 per cent increase in trade volumes in these goods.

Ongoing negotiations to liberalize trade in agriculture are expected to lead to a reduction in agricultural subsidies in some developed countries that should stimulate more efficient and sustainable agricultural production in developing countries. It is essential that developing countries are supported through capacity building to fully exploit the potential gains from trade liberalization, particularly in the context of a transition to a green economy.

However, as the Green Economy Report underscores, the bulk of financing for a green economy transition will need to come from the private sector; hence, the



Wonga Wongué Presidential Reserve, Estuaire Province, Gabon (0°23' S, 9°32' E).
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importance of regulatory certainty, sound public and corporate governance, and well-functioning patent regimes to build investor confidence. The financial services and investment sectors control trillions of dollars, and pro-active investment institutions are taking the lead by committing themselves to the UN-backed Principles for Responsible Investment (PRI).

At the same time, public financing is essential for jump-starting a green economic transformation. Consider, for example, the massive fiscal stimulus packages launched by G20 countries in recent years, an estimated USD 3.3 trillion of which, almost 16 per cent or USD 522 billion, was initially allocated towards green investments.

In addition, we also need new finance mechanisms such as the Green Climate Fund set up to support mitigation, adaptation, technology and capacity-building

activities in developing countries. Related to this, international and national development finance institutions need to revisit their procedures and commit to applying environmental criteria, as well as more ambitious targets, for green lending in target industry sectors.

Transitioning to a green economy is rising up the political thermometer as governments embark on the Road to Rio, twenty years after the 1992 Earth Summit. Within the context of sustainable development and poverty eradication, the green economy is moving from concept to reality because it offers our society and future generations a pathway to achieve sustainable development. As governments, businesses and civil society identify their perspective routes, we can all be hopeful because this common goal is truly within our grasp ◀



Achim Steiner

Achim Steiner, UNEP's Executive Director and Under-Secretary-General of the United Nations, was born in Brazil in 1961. Before joining UNEP, he served as Director General of the International Union for Conservation of Nature (IUCN) from 2001 to 2006. He also serves on a number of international advisory boards, including the China Council for International Cooperation on Environment and Development (CCICED). His professional career has included assignments with governmental, non-governmental and international organizations in different parts of the world including India, Pakistan, Germany, Zimbabwe, USA, Vietnam, South Africa, Switzerland and Kenya. He worked both at the grassroots level as well as at the highest levels of international policy-making to address the interface between environmental sustainability, social equity and economic development.

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When the world journeys to Rio de Janeiro, Brazil, next June,...
we will do so in a markedly different environment from
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Earth Summit of 1992

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Rio+20: opportunities and obstacles for the developing world

H. Elizabeth Thompson

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In this personal viewpoint, H. Elizabeth Thompson sees opportunities in the strengthening of the government-society-business interface on the Road to Rio for investment between countries and companies of the North and South, or South and South, and the development and trade in renewable energy technologies (RETs). She nevertheless cautions on some obstacles, notably access to green finance in the current economic climate, possible job losses and the need for retraining, as well as the spectre of green protectionism and green policy targets and conditionalities for funding. Success at Rio, Ms Thompson says, will be measured by the number of green economy efforts on which state and non-state actors will embark in its aftermath.

The setting for the Rio Conference

When the world journeys to Rio de Janeiro, Brazil, next June, where they will frame a new approach to development issues, we will do so in a markedly different environment from that which characterised the period surrounding the original Earth Summit of 1992. Human development and existence have been beset by new environmental, economic, security and social crises; geopolitical alliances and power are being reshaped; financial re-regulation is appearing where previously there had been deregulation; the labour intensive, blue collar economy has given way to a technology-based, service-oriented, knowledge-based society and economy; technology has transformed business, the customer, and the market in the same way that it has irrevocably changed communication and human interaction.

The BRIC/BASIC (Brasil, Russia, South Africa, India and China) countries have become major drivers of production, competition, capital and markets. Trade relationships have changed and are now linked to a body of environmental rules, while natural and man-made disasters such as climate change and other environmental factors are all having a significant impact on national and multi-lateral regulatory frameworks and policy approaches, as well as on the strategic and operational decisions which business managers must make to achieve their companies' strategic objectives.



This paper, which is written in a personal capacity, will look at some of the issues which are looming as potential obstacles or opportunities particularly for developing countries and SIDS on the Road to Rio. The Conference which seeks to reinvigorate the global sustainable development agenda at the political level, will review previous agreements on sustainable development to determine where and why attempts at implementation have fallen short, and assess the new emerging challenges to development which policy makers must confront. The Rio+20 Conference will also consider two broad themes – the international institutional framework for sustainable development, and the green economy within the context of poverty eradication and sustainable development.

The objectives of Rio+20

The reinvigoration of political will in relation to sustainable development is, in this writer's view, contingent on a change in the dialogue. First, by energising non-state actors in order to develop a broader constituency with an interest in, and keenness to see, a sustainable agenda put in place. These "converts" will in turn become part of the lobby to which governments will respond. Second, by broadening the dialogue from the usual allies in ministries of environment, natural resources and related organisations to those in the ministries of agriculture, energy, trade, foreign affairs, finance and economic affairs, the latter of whom will be making the critical decisions about national policy priorities and budgetary allocations. It is only in this way that sustainable development can be mainstreamed into national policy formulation and implementation.

The themes of the Conference

International institutional framework for sustainable development

Turning to the themes, many suggestions are on the table in relation to the theme of the institutional framework for sustainable development ranging from maintaining the *status quo*, to re-engineering existing structures, to radical change of the architecture by establishing a new global organisation. It would be prudent that any new framework or institution be crafted only after having given consideration to the shortcomings of present structures and a genuine understanding of how best any replacement structure and negotiated agreement can

Trade relationships
have changed and are
now linked to a body
of environmental rules

effectively assist Member States with policy formulation and implementation of the three pillars of sustainable development.

The theme of institutional framework has not enjoyed the same degree of discussion as the newer theme of "green economy"; perhaps because any transition to a green economy arguably carries greater inherent risks and social costs for countries than that of institutional structures. United Nations Secretary-General Ban Ki-Moon points to the importance of "pressing for global economic governance that strikes the right balance among the economic, social and environmental pillars of sustainable development." He views the Rio+20 Conference as "a timely opportunity to get the world on track in this regard."

The Green Economy

The formal theme is "green economy in the context of sustainable development and poverty eradication." The attempt to catalyse a global green economy is a response to the resource constraints impacting human activity and enterprise, and an effort to move away from ineffective, inequitable development models to a more sustainable model of, and approach to, development. Even before this theme was chosen, many countries have, of their own volition, been putting aspects of green economy policies in place as they seek to improve quality of life for present and future generations by growing their economies through the valuation of their human, social and finite natural resource capital, without expanding their ecological footprint.

While there are some common features which characterise the green economy, it is a flexible tool intended to create new prosperity for citizens and can be shaped according to countries domestic strategic priorities, general circumstances and natural resource endowments.

Opportunities in a global green economy

In an article published in 2007 in the *Harvard Business Review* on Green Strategy, Lovins, Lovins and Hawken argue that "because natural capitalism is both necessary and profitable, it will subsume traditional industrialism just as industrialism subsumed agrarianism." Whenever oil prices spike, there is a corollary increase in the calls for renewable energy technologies (RETs). These calls diminish in urgency, vigour and frequency when oil prices fall.

Flood Ravages Southeastern Haiti

A scene of the destruction of homes and property
2 June 2004



UN Photo/Evan Schneider

On this occasion, the voices in support of RETs are reaching crescendo with a large supporting cast and audience because of the universality and convergence of the social, economic and environmental problems facing a majority of countries, developed and developing.

Governments will be responsible for creating the environment which will bring the global green economy into being, through leadership and policies which establish enabling environments for business sector investment in green practices and the use and development of green technologies. As natural resource constraints increase, so too does the urgency of the challenge facing the South to meet national development demands, especially those countries with large populations. Countries of the South which develop and/or utilise RETs will guarantee themselves a new level of national security and sustainability, and create a buffer from environmental and exogenous economic shocks (since disaster risk mitigation is a component of green economy policy).

One opportunity to which the new global economy will give rise is that of strengthening the government-business-society interface and creating new levels of collaboration on issues of sustainability. Business writers are increasingly speaking to the enhanced profitability which businesses enjoy when they practise sustainability and the extent to which this attracts committed, high calibre employees, enhances brand reputation, generates greater efficiency and innovation, gives the business competitive advantage and ultimately benefits society.

Implicit in the green economy is the opportunity for improved quality of life, economic growth and business profitability. The heavily industrialised North, with its broad experience in research and development and its many multinational corporations, will be easily able to pursue the new business opportunities. It should not be assumed however, that all of the green technologies or successful policy interventions in creating national green approaches reside in the North, or even in the large developing countries.

The green economy of which green energy is an important component, could bring many countries closer to some semblance of energy security, particularly those with significant renewable energy resources, which are also located far from the centres of hydrocarbon extraction and production. Many developing countries, especially SIDS have an abundance of renewable energy resources which make them “living laboratories” for the development and implementation of green technologies. China has made significant headway in utilising and developing, manufacturing and exportation of green technology and equipment. Brazil has been a pioneer in the development and use of ethanol from sugar cane, which places no threat on food stocks. This has served to reduce the country’s energy intensity. Brazil’s leadership in biofuels is all the more remarkable because it is an oil producing country.

The small island developing state of Barbados developed an indigenous solar water heating industry in the early 1980s and in consequence is now recognised by the International Energy Agency (IEA) as within the world’s top ten countries per capita of solar water heater penetration. In the process it has been able to generate jobs, reduce oil imports on which foreign exchange expenditure has been saved, generate revenues from the sale of these units and the licensing rights to produce them. A global green economy could provide an opportunity for investment between countries and companies of the North and South, or South and South, which facilitates financing, scaling up of the technologies and the opening of larger markets to sound green technologies and products.

The use and development of renewable energy technologies, making them market and scale ready, will be central to the transition to the green economy. The breadth of the opportunity here should not be underestimated; especially having regard for the IPCC’s latest report on renewable energy, which indicates that with the right policy initiatives and effort, 70% of energy demand could be satisfied by RETs by 2050. In this regard, the “30/30 energy goals” of guaranteeing universal access to energy, reducing energy intensity and increasing energy efficiency and switching to 30% renewables, all by 2030, are of extreme importance.

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Natural and man-made disasters such as climate change and other environmental factors are all having a significant impact on national and multilateral regulatory frameworks and policy approaches

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Even in recognising the opportunities for the South, care must be taken that, in seeking to create the kind of open and level platforms such as has been attempted with trade, there is not greater marginalisation of the smallest or poorest countries, which lack the financial base, economies of scale and industrialisation so essential to grasping and maximising the opportunities in both the brown and green market places. The reports of the UN SIDS Conference of 1994, then later, the Commonwealth and World Bank's Joint Task Force of 2000, have acknowledged the "peculiar vulnerabilities" –social, economic and ecological- of SIDS and other small open economies.

The benefits to the environment of a green economy policy and sustainability practices are real and obvious but it is the people of the world who most need a change in their circumstances. Some one billion people across the globe live in abject poverty on less than USD 1 per day, while the number who eke out an existence on less than USD 2 per day is 2.7 billion, with millions more forced to live as refugees. In the global financial meltdown, millions have lost their homes and jobs. People who saw themselves as relatively secure now live in penury and those previously on the margins of poverty are in extreme crisis. Ensuring sustainable development for all the world's people through access to decent work, education, health care, housing, water, energy, and services improves living standards and creates a larger global economy with increased consumers and spending capacity.

Modern technology creates the opportunity for truly global participation at Rio by having a virtual forum which any person on the globe with internet access could "attend" and contribute to the discussion on sustainable development.

Obstacles to a global green economy

Management theorists often speak of the complexity of, and high level of failure in, successfully effecting transformative change in an organisation. Creating change at the global level, across countries of differing social, economic, ecological and political circumstances is even more complex. What then might be some of the greatest obstacles to the implementation of a global green economy? The experience with trade has demonstrated that the small open economy has little opportunity of competing with the economy of large industrialised nations. Inability to create economies of scope and scale, capacity to resist

external shocks, high vulnerability indices, a dearth of skills and training, lack of technology and finance and lack of resilience capacity, confound developing nations, particularly those which are small and medium sized. Care must be taken to ensure that the creation of a global green economy does not constitute a larger wedge between North and South.

In this regard, the availability of capital and technology to facilitate the transition to the green economy are of concern. How will developing countries be able to afford the transition without economic damage and reversals or interruption of development gains? Partnerships and the Bretton Woods Institutions will play a pivotal role in mobilising finance as well as the development and transfer of technology. It is yet to be seen what level of traction will be gained by the proposals being mooted by some for a Global Green Fund, and that each country should set aside 2% of national GDP toward the transition. It may be argued that if we were not in a period of global economic contraction, countries would be more inclined to make such a commitment of national resources. Nonetheless, countries may well see the need to do so as enlightened self-interest.

It is expected that the transition process may cause some job losses, but the UNEP Report of 2011 on the Green Economy assures, based on research done, that the green jobs created will exceed those which are lost. That will have implications for the rate at which developing economies will generate the new jobs and therefore the level to which unemployment may rise in the short and medium term. Moreover there will be other social costs including retraining and retooling the labour force.

There are transition related issues which require careful cerebration. Emerging policy and regulatory frameworks must guard against "green protectionism." The new trade regimes have, albeit inadvertently, resulted in some developing countries having difficulties accessing markets. Some countries are unable to meet phytosanitary and other eco-conditions. Vigilance will be required to ensure that developing countries are not disadvantaged. Another possible point of difficulty for developing countries would be having to satisfy green conditionalities as a prerequisite for trade or the conduct of business. A further question being asked is "will International Financial (Bretton Woods) Institutions require countries to develop certain green policy targets and conditionalities prior to



New Orleans after Hurricane Katrina, Louisiana, United States (30°00' N, 90°05' W)
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accessing development funding?” Caution must be exercised at the scale and pace at which developing countries are expected to effect the transition.

Will companies bidding on consultancies or other projects financed by the IFIs be expected to green their operations in very much the same way that they are required to meet other criteria? In time, will commercial domestic banks have similar rules for business entities which seek funding? Will green accounting principles become incorporated into the accounting systems, practices or business plans of the public and private sectors? Countries may or may not contemplate a National Sustainability Index (NSI) which incorporates both goods and services produced in the economy (GDP), as well as quality of life, national services, decent work, gender parity, health, education and housing access, amongst other social considerations.

Defining success at Rio

This brings us to the issue of what would it take to make Rio a success? Momentum is building, with greater convergence amongst countries on the issues to be addressed at Rio. Despite this, the negotiation process is such that even if they are ad idem on the issues, consensus might elude governments for any number of reasons. Should this occur, one could almost write newspaper and blog headlines in the following days and weeks.

It is my submission however, that if Rio is viewed as a platform at which a global change process will be initiated, then it is ***not the road to Rio but the road from Rio*** which becomes the primary focus and the ultimate measure of success. For Rio could become the catalyst and entry of the global green economy which could provide stakeholders in the environmental, economic and social sectors with the programmes, policies and impetus to ultimately achieve global sustainable development.

Given the level of discussion, the initiatives being proposed or pursued by a number of UN agencies, International Financial Institutions (IFIs), non-governmental organizations (NGOs), academia and business, then the advent of change is here. In that context, the real definition and test of success at Rio is the number of green economy efforts on which state and non-state actors will embark as a consequence of their contact with the Rio+20 process and its stimulation of a thrust for a global green economy. When the gavel goes down at Rio+20 and multiple stakeholders, state and non-state, leave Brazil committed to sustainability across sectors, then the Rio+20 Conference will have been a success. The attainment of global sustainable development is a work in progress, but Rio+20 could well be one of those historic times when the path that is chosen results in transformative change and the start of a new era ◀



H. Elizabeth Thompson

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As progress on sustainable development and climate change has stalled at the international level, there is growing consensus that new actors and new processes must help tackle the sustainable development challenge

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Governor of California Addresses Climate Change Meeting

Arnold Schwarzenegger, Governor of California, addresses the High-Level meeting on Climate Change, at UN Headquarters in New York
24 September 2007



Sub-national governments can lead the way to a green economy

Terry Tamminen and Christophe Nuttall

In cooperation with Arnold Schwarzenegger

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The authors present two emerging issues that, they say, offer great opportunity and hope for the green economy. One is the emerging role of sub-national authorities who, working closely with citizens, make the majority of decisions for localized sustainable development. The second issue is the need for new global governance on sustainable development that challenges the present orientation where many stakeholders are working in isolation to the detriment of goals. The authors add that 'R20 Regions of Climate Action' has a serious contribution to make towards tackling these challenges.

The role of sub-national Governments

While national governments, NGOs and the private sector are more often mentioned as being at the forefront of sustainable development in general, and climate change in particular, one still needs to stress the important role of sub-national governments.

Indeed, as progress on sustainable development and climate change has stalled at the international level, there is growing consensus that new actors and new processes must help tackle the sustainable development challenge. Sub-national governments¹ are key actors for many reasons.

First of all, while national governments set policies, these are almost without exception implemented at lower levels either by decentralized or deconcentrated authorities or bodies. This is also true in the field of climate change. According to an estimate by the United Nations Development Programme (UNDP)², most investments to reduce greenhouse gas (GHG) emissions and adapt to climate change—50 to 80% for reductions, and up to 100% for adaptation—must take place at the sub-national and local levels.

In the United States, for example, 33 out of 50 states now have some kind of sustainable development, energy efficiency, renewable energy or climate change plan that is based on what the state of California has done. If the entire United States followed California's example, greenhouse gas emissions would be reduced by 27% below 1990 levels by 2020.

This is why President Obama was able to announce in 2008 at the first Governors' Global Climate Summit in Los Angeles that his administration would adopt the same goals as California and other leading states to reduce greenhouse gases down to the 1990 levels by 2020 and 80% below that by 2050. The US President committed to similar goals again at the United Nations Climate Change Conference, COP15, in Copenhagen in December 2009.

But the Green Economy is not only about the environment; it is also about jobs.



Green jobs in California

From 2003 to 2010, when R20 Founding Chair Arnold Schwarzenegger was Governor of California, he was able to pass programmes like a 'Million Solar Roofs' and the Global Warming Solutions Act of 2006. These policies enabled entrepreneurs to develop efficient solar panels in addition to other technologies, including new eco-friendly cars like the Tesla. Added to that, all of the venture capital that helps launch these companies and expands markets for clean technology makes California a truly clean economy engine and creator of new jobs. A recent survey by the State of California³ found that green jobs accounted for 3.4% of the state's total employment, while the San Joaquin Valley (an area in the central valley of California) made up 10.6% of the sector.

An estimated 432,840 green jobs, ranging from solar installers and water system designers to recyclers and heating, ventilation and air-conditioning (HVAC) technicians, accounted for 2.8% of all jobs in the eight-county region of the San Joaquin Valley. With 27,880 employed in such fields, the region accounted for 10.6% of the State's green workforce. Of that total, 320 jobs were involved in renewable energy, 4,130 in recycling and waste management, 2,780 in energy efficiency, 1,760 in education, compliance, and awareness and 18,890 in natural and sustainable product manufacturing.

Although it has been slowing down in recent years, San Joaquin Valley's green economy expanded by 55% from January 1995 to 2009, producing nearly 3,360 jobs and 390 new business establishments. Employment in the energy generation sector grew 113%—1,200 jobs—during the same period, leading to 24% of green employment. Recycling and waste management also had a 24% share of the region's green employment, an increase of 4% from January 2008 to 2009. Clean transportation employment, with a concentration of 50% above the state average, more than tripled from 1995 to 2009, growing to nearly 500 jobs.

According to a study conducted by GreenJobSpider.com last year, California was the top State hiring for green jobs, with over 7,500 green jobs posted online.

The results in California and San Joaquin Valley can certainly be replicated at a global level.

For a new sustainable development governance

A major deadlock for real sustainable development is the lack of an effective governance system that integrates a variety of government levels and stakeholders. A new governance mechanism for sustainable development is required that would allow for stakeholders to sit at the same table, discuss, listen to each other, find solutions and commit to action, but within the context of their respective needs and responsibilities.

There are several intergovernmental organizations working on similar issues including the UN, the G8, G20, the BASIC⁴, and the BRIC⁵. However, these have traditionally focused on action at the national government level. In addition, there are the World Economic Forum, the World Energy Council, the World Business Council for Sustainable Development, NGOs, Think Tanks and Academia. Increasingly, sub-national governments are participating in groups such as UCLG, ICLEI, C40, FOGAR, The Climate Group and NRG4SD⁶.

All of these different institutions have goals, missions and activities, but they all work in isolation with very little concrete interaction at the operational level.

Even with the great efforts made by the United Nations to tackle climate change through the Kyoto Protocol, biodiversity, desertification and other matters, only national governments have a say in these negotiations. Sub-national governments –where the action is– are invited only to peripheral events, where nothing really tangible happens with regard to the negotiations.

Sustainable development cannot be tackled by entities in isolation, be it the UN, national governments, the private sector, NGO's, cities and regions. Such a challenge, which is huge and complex, needs a new global governance through a sound coalition of expertise, decision-making and finance. Hundreds of inspiring small projects are being undertaken in villages, cities and regions of developing countries –thanks to the work of UN agencies, donor governments, NGOs, foundations, private companies and decentralized cooperation by industrialized cities and regions.



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R20 is not just another NGO or network of regions.
It is a real coalition of forces that collectively believe that
sustainable development and green economic development
can be tackled at the sub-national level

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Even if all these projects have merits, such a scattered and dispersed approach does not constitute a solid development strategy. We can only agree with the UNDP and UNEP's (United Nations Environment Programme) territorial approach to climate change, which aims at developing a truly integrated, strategic development action plan, based on a low carbon, green and resilient economy.

A contribution towards governance for sustainable development: R20 Regions of Climate Action

In September 2009, California and other sub-national governments co-hosted the second Governors' Global Climate Summit in California. At that time, there was a sense that national governments were not likely to achieve a new deal to tackle climate change by COP15 in Copenhagen later that year. However, an important message emanating from the Summit was that sub-national governments were rolling up their sleeves and getting to work – building sustainable economies and reducing dependence on dangerous, limited fossil fuels. It was possible to get states, provinces and cities working together, and everyone agreed that having an organization to share policies, technologies and finance was the way to go.

This concept was discussed among governors and premiers, with presidents of regions of North and South America, Europe, Asia and Africa, as well as the United Nations, other international agencies, clean technology developers and NGOs; and they all agreed to launch the R20: Regions for Climate Action, focused on green economic development. R20 is not just another NGO or network of regions. It is a real coalition of forces that collectively believe that sustainable development and green economic development can be tackled at the sub-national level. It is a coalition determined to achieve the necessary paradigm shift already accomplished in California.

Indeed, the diverse alliance of R20 partners, which includes NGOs, corporations, academic institutions, intergovernmental organizations, international finance institutions, United Nations programmes and national governments, will actively support the development and deployment of low carbon and clean energy solutions in sub-national governments around the world.

R20 projects are designed to produce local economic and environmental benefits in the form of reduced energy consumption and greenhouse gas emissions, strong local economies, improved public health and new green jobs. These local actions will help the world achieve shared global environmental and economic goals.

The R20 develops and implements "Technology in Action" projects across regions and works with individual regional governments to showcase, implement, and strategically advise "Region in Action" projects that are likely to gain access to needed finance through "Finance in Action".

Technology in Action projects follow a "top down" development approach wherein the R20 develops a project methodology and/or performance standard for a specific low carbon technology (e.g. public street LED, cool roofs, solar power plant, etc.) that can be implemented simultaneously by a large number of sub-national governments. The large scale of the project ensures cost savings and maximizes environmental and economic benefits. These projects are replicable within, and applicable to, a large number of sub-national governments worldwide.

Region in Action initiatives are designed to promote and advance past, current, and future sub-national climate actions. To do this, the R20 provides three services to its members: **1)** Communications and Information Sharing Network, which showcases members' successful climate policies, programmes and projects; **2)** Low Carbon Project Implementation Support, wherein the R20 helps bring technology and finance partners to catalyse implementation of already identified projects; and **3)** Strategic Climate Advisory Services, wherein the R20 helps regions without internal resources to develop strategic climate actions to help improve their communities.

Through these services, the R20 will improve the dissemination of successful policies and programmes across sub-national governments, identify key technological and financial resources to ensure critical sub-national climate projects are implemented, and help regions with limited knowledge and resources better understand how to combat climate change within their communities, and take action.

Finance in Action: there is already a wealth of information on public finance mechanisms and the risks and



Secretary-General's Press Encounter in San Jose

Secretary-General Ban Ki-moon (left) holds a joint press conference with Governor Arnold Schwarzenegger of California in the city of San Jose, California
27 July 2007

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If the entire United States followed California's example, greenhouse gas emissions would be reduced by 27 per cent below 1990 levels by 2020
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Conclusion

barriers to the private sector. The R20 believes that a process of practical experimentation and collaboration between the public and private sectors is now critical. By working with sub-national green economy programmes, the R20 will help to reduce the gap between generic discussions and action in the field; notably the gap, due to the lack of viable projects and the perceived and real risks associated with sustainable development, between those seeking capital for low carbon investment and those willing to invest. The R20 will reduce the current distance between investors and project proponents by:

- ☞ Providing guidance to regions: mapping of international and national sources of environmental finance for sub-national governments;
- ☞ Building on existing and facilitating the flow of deals by creating strategic partnerships with key environment funds and environment finance facilities;
- ☞ Bringing in new actors and investors; and,
- ☞ Creating a dedicated financial vehicle by incubating the R20 Green Capital Corporation.

The successful implementation in sub-national governments of low carbon and climate resilient projects for sustainable development will demonstrate that real action is not only desirable but also possible, given their environmental, economic and health benefits. These proven results will create momentum for such win-win projects to be implemented at a national level, and will help nations better understand how their national climate reduction goals can be achieved.

Further, the R20's projects should encourage national governments to accelerate their acceptance and implementation of international agreements, domestic targets, and nationally appropriate measures, as the R20 will demonstrate how nations can work with sub-national governments to achieve their national goals.

The R20 brings together a diverse alliance of sub-national governments and partners to develop, finance, implement, evaluate, and replicate low carbon and climate resilient projects on a worldwide scale. The *R20 Regions of Climate Action* is a *practical, credible solution to sustainable development* that will simultaneously accelerate sustainable economic development in communities that most need opportunities for growth ◀

Example of cooperation with the Asian Development Bank (ADB)

The R20 has partnered with the ADB on a project to be financed through different ADB facilities. The aim is to create a "Regions Fund" within one of the existing facilities, which sub-national governments can directly access. According to the arrangement, the R20:

- Participates in the scoping missions that identify a first list of projects.
- Works with the sub-national government and the national government and R20 partners such as the International Chamber of Commerce (ICC) to mitigate some of the risks associated with potential projects (value chain development through local enterprises, stable policies etc.).
- Identifies additional investors for the projects to either co-invest with ADB or create their own syndicate.



Wind turbines of Banning Pass, near Palm Springs, California, United States (33°55'N, 116°42'W). © Yann Arthus-Bertrand / Altitude - Paris

Endnotes

- 1 'Sub-national governments' in this paper refers to the level of government directly below the national government. Depending on the country, this definition can correspond to a wide variety of structures with diverse prerogatives. Examples of sub-national governments include states, regions, provinces, districts, metropolitan governments.
- 2 "Charting a New Low-Carbon Route to Development: A primer on Integrated Planning for Regional Governments" UNDP, 132 p., 2009.
- 3 The Business Journal, Tuesday June 7, 2011
- 4 Brazil, South Africa, India and China.
- 5 Brazil, Russia, India and China.
- 6 UCLG: United Cities and Local Governments; ICLEI: Local Government for Sustainability; FOGAR: Regions United; NRG4SD: Network of regional governments for sustainable development.



About the authors

Terry Tamminen is one of the nation's leading authorities on environmental policy. Governor Arnold Schwarzenegger appointed Mr. Tamminen Secretary of the California Environmental Protection Agency in November, 2003, and Cabinet Secretary, the chief policy advisor to the Governor, in December, 2004. He now advises California Governor Jerry Brown on energy and environmental policy matters and serves as an advisor to several other governors, Canadian Premiers, European Union leaders, and environmental organizations. Mr. Tamminen is the author of several books on environmental policy, is a sought-after international lecturer on climate control and energy issues and has received numerous awards and honors for his achievements. He is the co-founder and Executive Board member of the R20 Regions of Climate Action, a new public-private partnership among more than 100 regional governments, the United Nations, and numerous clean technology companies focused on low carbon economic development worldwide. The UK's Guardian newspaper named Mr. Tamminen one of "50 People Who Could Save the Planet."



Christophe Nuttall has been Director of the Hub for Innovative Partnerships at the United Nations Development Programme (UNDP) since 2005, where he is in charge of the development of partnerships with local / regional authorities. He has also opened institutional relations with sub-national authorities and the wider UN System and developed the decentralization cooperation programme and a network of 12 training centres around the world for local and regional authorities. He also launched the international multi partnerships type II initiative on access to basic services, adopted at the 2007 UN-HABITAT board and then adopted at the 2009 ECOSOC. Christophe Nuttall will be appointed as the first Executive Director of R20.



Louis-Saint-Laurent icebreaker in Resolute Bay, Nunavut Territory, Canada (74°42' N, 95°18' W)
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Canada struggles to move towards a green economy

Andy Hira and Christopher Kukucha

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Andy Hira and Chris Kukucha explore why the environmental performance of Canada has, despite numerous examples of its remarkable sensitivity to environmental issues, “come up short”. They say that Canada's current fragmentation in environmental policy is due to federalism, a primary economic focus on the US rather than national partners, and widely diverging provincial environmental strategies, based on variable resource dependency and voluntary targets. In their view, Canada's federal-provincial relations, with excessive decentralization of environmental policy, are a cautionary tale on how not to achieve environmental goals.

Introduction

What can other countries, particularly developing countries, learn from Canada's experience in environmental policies? In general, Canada's environmental performance has been relatively weak, if measured by its actions to curb climate change and move towards a green, sustainable economy. There are several strong initiatives in Canada that deserve more attention. We conclude that, despite these positive features, long-term economic and political constraints impede the structural changes needed to move forward.

Canadian environmental performance comes up short

By a wide variety of measures, Canada's environmental performance lags behind its status as a major economic power with high standards of living. For example, the Yale University-based environmental performance index (EPI), calculated from 25 different measures, ranks Canada 46th, behind countries such as Mexico and Algeria. The latest (2008) statistics from the International Energy Agency (IEA) put Canada in 12th place overall in terms of per capita carbon emitters, behind oil producers, with Australia and the US the only developed economies emitting more.

To be fair, Canada, like Australia and the US, is geographically widespread, meaning that, while it is a world leader in hydro-based (renewable) sources for electricity production, transportation is still highly motor vehicle dependent. Moreover, like the most intensive emitters, Canada is a major oil producer; thus the nature of its

economic activity presents especially difficult challenges. There are some remarkable initiatives to address Canadian environmental challenges. However, as the EPI indicates, the problems go far beyond this simple factor and reflect an overall disappointing performance in terms of pro-active policies to address climate change.

Interesting aspects of Canadian policy initiatives

There are several aspects of Canadian environmental policies that are worth highlighting. First, the emphasis in Canada on developing consensus and cooperation among multiple stakeholders is remarkable. Agencies such as Environment Canada promote transparency through the realms of public information on their websites. Environmental assessments are commonly required in most major projects, and include requirements for allowing public consultation, as well as discussion with specific stakeholders, notably First Nations (aboriginal) groups (Sinclair and Doelle, 2010).

Recent elections have featured major national debates about national policy such as former Liberal leader Stephane Dion's championing of a green economy vision for the future. Another feature was the rise of a Canadian Green Party, which was successful in securing a parliament seat for the first time in 2011. Canadian non-governmental organizations (NGOs) such as Greenpeace have been very active at all levels in promoting environmental awareness. For example, pressure on the British Columbia (BC) government towards preserving the

Therein lies the dilemma for Canada. Any green initiatives must involve the provinces

Great Bear rainforest led to the government's decision to set aside land for public preservation in 2007. Canadian diamond mines in the Northwest Territories are considered an interesting model for resource governance with their provisions for local community participation (Fitzpatrick, 2008).

The origins of the consensual approach can be traced to the historically developed limits on federal power, leaving resource management largely to provinces. However, the multi-stakeholder approach permeates all levels of policy discussion. For example, the Greater Vancouver Regional District, established by the province of British Columbia, coordinates public service planning across 21 municipalities (Dorcey, 2010).

Providing for initiatives to operate largely at the provincial level allows for greater tailoring as well as experimentation. For example, a series of grants through Genome Canada to provincial counterparts includes attempts to find ways to reduce environmental waste specific to certain locations, such as mine remediation in British Columbia. Despite criticism, Alberta's management of the oil tar sands includes several "clean-energy" programmes. The province has, for example, promised significant financial support for the development of carbon capture and storage. Alberta Innovates is a funding programme for research and technology limiting the impact of energy development.

Reclamation of industry sites in the oil sands is also a priority, with over 7 million tree seedlings being planted and ongoing research being funded. It is a legal requirement in BC for forest companies to replant trees after harvesting. Resource preservation is thus an integral part of Canadian discourse, in part reflecting lessons learned from resource depletion, such as the collapse of fisheries in the Atlantic provinces.

Canada has successfully applied the same approach in many areas through attempts to coordinate policy with the US, reflecting its economic dependence on its southern neighbour. For example, new regulations on biotechnology not only seek to preserve public safety but also to help harmonize Canadian production with global standards, recognizing the need for exports. The importance

of regulatory harmonization with the US goes back over a century. It includes shared resource management, such as preservation efforts in the Great Lakes, as well as consensus-building agreements around the shared effects of pollution. Canadian economic vulnerability to such problems was brought home in the 1990s when the US temporarily banned imports of Canadian beef for fear of mad cow disease (BSE).

Canadian companies have huge stakes in global trade and investment, particularly in resource sectors abroad. These concerns have led companies in both the mining and forestry sectors to undertake efforts in sustainability and triple bottom line responsibility, such as the Global Mining Initiative and the Forest Stewardship Council certification system.

While the Canadian approach has, on the one hand, significantly reduced resource conflict and allowed for more local initiatives, it has, on the other, made the creation of collective goods, such as the development of adequate enforcement for fishing off coastal waters, considerably more difficult.

Sources of challenges for collective environmental action

The nature of Canada's rich resource base, as well as the concentration of the population close to the southern border, has leant itself to a deep historical interaction with the US economy preventing, in the process the development of strong internal economic dynamics. Even today, there tend to be more North-South economic transactions than East-West. For example, there are a plethora of energy connections between Canadian provinces and US states, while East-West connections between some provinces are far less developed.

Today, although Canada has a highly diversified economy, the nation's fortunes are still closely tied to resources. Table 1 below shows that resource-based activity is concentrated in several Western and Atlantic provinces, while manufacturing is concentrated in Ontario and Quebec. British Columbia (BC) has developed a more service-oriented economy.

Table 1: Natural resource-based activity by province and nationally (% of provincial GDP)

	Alberta	British Columbia	Manitoba	Newfoundland	Ontario	Quebec	Saskatchewan	Canada
1997	26	9	11	13	5	7	27	10
2007	32	10	12	50	4	7	32	12

Source: Author calculations, based on data from CANSIM.



Resource dependence alone does not condemn a country to poor environmental performance: indeed, the EPI rankings place countries such as Costa Rica, Sweden and Norway towards the top, well above Canada. Part of the difference is that, from the beginning of its history, Canada's resources have been managed by a partnership between generally large commercial enterprises and the state. Initially, as an English colony, the Hudson Bay Company was given monopoly privileges for trading in frontier areas (Easterbrook and Aitken, 1988, 82). In the 19th century, the Canadian government helped guarantee low interest finance for charter companies building railroads westward, eventually monopolized by the Canadian Pacific Railway (Easterbrook and Aitken, 1988, 298).

These early public-private partnerships reflected Canada's small local market and the need for costly and high risk infrastructure to open up transportation routes that neither party alone could provide. Motivation was also provided by concerns over territorial integrity and resource autonomy from the rapidly growing US (Easterbrook and Aitken, 1988, 381).

Similar economic policies were pursued in the twentieth century. In the 1950s, Harold Innis, through his "staples" approach, questioned the wisdom of relying on exports of raw materials, as well as heavy dependency on foreign investment. He cited the likelihood of high debt levels and boom-burst economic cycles, such as wheat during the beginning of the 20th century, and petroleum more recently.

It is precisely these concerns, as well as propitious circumstances (world economic conditions during the Great Depression and World Wars I and II), that led to the Canadian state championing diversification through industrialisation and, more recently, services. These include support for well known national companies such as Petro-Canada (oil), initially a state company; Bombardier (aircraft); and Research In Motion (wireless communication). However, the concentration of manufacturing and high value services in just a few Eastern provinces and BC have also exacerbated tensions with other provinces that remain largely resource-dependent (Norrie, Owrap and Emery, 2002, 272 & 364).

Despite the recognition of its economic vulnerability, Canada has generally failed to gain economic autonomy. Both in security and economic terms, its fortunes, and

policy initiatives with them, remain closely tied to the US. For example, it has struggled with enforcement of its resource base in proximity to international borders. It is unable to enforce fishing regulations in coastal areas and the opening of an Arctic passage brings new vulnerabilities to encroachment. In a sense, Canada gave up on autonomy when it opened up the economy to large scale integration with the US through the 1989 Canada-US Free Trade Agreement.

This historical reality of Canada's resource-based economy makes it clear that the development of green initiatives will not come solely from government or from the private sector. Canadian federalism is the key to understanding the difficulties of achieving collective action on the environment.

How federal-provincial relations, rather than apparent multilateralism, shaped environmental reactions

Simply looking at international agreements, it appears Canada is a world leader. Indeed, Canada committed itself to the cornerstones of the current environmental debate, including the 1987 World Commission on Environment and Development, better known as the Brundtland Commission, and the 1992 United Nations Conference on Environment and Development (the Rio Summit). The UN Framework Convention on Climate Change (UNFCCC) and its subsequent Kyoto Protocol (1997) were extensions of Canada's international agenda (McKenzie, 2002, 242-268). For the most part, these commitments included a number of broad categories, all with implications for provincial jurisdiction: water pollution, acid rain, fisheries, pesticides, trade, environment and climate change.

However, as foreign obligations increased, so did federal-provincial tension in the area of environmental policy. The development of the federal government's National Action Plan on Climate Change (NAPCC) in 1993, with its goal of stabilizing greenhouse gas emissions by the year 2000, also exposed distinct differences between provinces, especially those dependent on carbon-based exports, such as Alberta, and others, namely Quebec, with "cleaner" hydro power. These divisions meant that Canada's early goals would be limited to voluntary targets, making it difficult to actually reduce carbon emissions (Macdonald and Smith, 1999-2000, 112).



Underlying these tensions is resource endowment inequity across regions as well as the need to placate Quebec-based claims of economic discrimination. Ontario's domination as a financial and industrial centre has been perceived to overlap with federal interests (Norrie, Owsram and Emery, 2002, 410). The decline of regions during resource busts, such as fisheries in the Atlantic, has led the government to engage in equalization payments to lagging provinces.

Simply put, the federal government in Canada cannot politically afford to appear to be discriminating against specific regions and provinces. The few instances of major initiatives to restructure the economy, such as the 1980s National Energy Policy, by which the Federal Government sought to tap in further on rising oil revenues from Alberta, have been major failures.

Federal environmental policy in Canada is complicated by basic constitutional realities because Canadian provinces are granted jurisdiction over environmental issues in Canada's constitution. At the same time, this makes it difficult for Canada to assume commitments at the international level. Canadian provinces have the right to intervene on international matters with relevance to provincial jurisdiction. Therein lies the dilemma for Canada. Any green initiatives must involve the provinces (Kukucha, 2005).

Domestic tensions surfaced again during the 1997 United Nations negotiations over climate change in Kyoto, Japan. Going into the talks, there was considerable disagreement on Canada's approach to greenhouse emissions between the federal government, Alberta, industry and environmental groups. Initially, the provinces agreed to a national target to stabilize emissions at 1990 levels by 2010. By the end of negotiations, the federal government agreed to a more ambitious target of reducing emissions by 6% below 1990 levels by the year 2010.

Although several provinces were quick to denounce these unilateral changes, both levels of government were eventually able to establish a National Climate Change Business Plan in 2000. The dissatisfaction of provinces was further exacerbated by the fact the United States did not ratify the Kyoto Protocol in 2001, prompting competitiveness concerns in some provinces, especially Alberta. Despite these problems, Canada's prime minister, Jean

Chrétien, surprisingly declared at the 2002 World Summit on Sustainable Development that Parliament would ratify the Kyoto Protocol by the end of the year (Harrison, 2003, 338). As promised, the legislation ratifying the agreement was passed in December 2002.

Despite significant political support from Alberta, Canada's current Conservative Prime Minister, Stephen Harper, did not remove Canada from the Kyoto Protocol following the formation of his first minority government in 2006. In order to solidify his political base, however, he made it clear that the Liberal's previous Kyoto commitments were unrealistic and a threat to Canada's economy. As an extension of this provincial strategy the Conservatives also made it a practice to highlight the practices of large emitters such as China and other Kyoto signatories, especially in Europe, for not achieving significant emissions reductions.

The election of Barack Obama in the United States allowed Harper to further distance his government from previous Liberal commitments. Obama and US Democrats prioritized climate change and Canadian officials responded by calling for a bilateral North American agreement to counter the broader, and more ambitious, Kyoto agenda. In pursuit of this goal, both governments agreed to initiate a Canada-US Clean Energy Dialogue in 2009, which resulted in the signing of a Declaration of Intent ("DOI") for Cooperation in Energy, Science and Technology in April 2010. This agreement focused on bilateral collaboration for research and development in bio-energy and carbon capture and storage.

These international initiatives, however, create deep divisions among Canadian provinces on environmental issues. Provinces such as Manitoba, Quebec and British Columbia tend to support reductions in emissions due to extensive supplies of hydro-electricity. All three provinces are also members of the Western Climate Initiative (WCI), which has proposed a North American regional cap and trade system for its partners and observers (five provinces, the Yukon territory, 15 US states, and six sub-federal governments in Mexico).

Hydro, along with wind and solar power, are considered to be comparatively "clean" sources of energy and generate carbon-credits, which can then be sold to other governments. In an emerging cap and trade system, polluters



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It is important to note, however, that these provincial initiatives are not based on altruism. They are due to economic concerns related to future federal policies on climate change

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will be required to purchase carbon-credits to maintain high emissions. The economic benefits for these provinces are obvious. Other provincial governments, however, are opposed to stricter emissions standards. Alberta, for example, with its reliance on oil and gas exports, proposed a more industry-friendly, intensity-based system in 2007. Under this plan, large-scale industries, such as those companies operating in the Alberta oil sands, would lower the amount of energy used per unit of output. The effect would be to reduce the rate of growth in emissions rather than the actual amount of greenhouse gases being emitted.

The Harper government made it clear in 2006 that they had no intention of meeting previously negotiated Kyoto targets and instead proposed a “made in Canada” solution. The federal plan announced in April 2007, however, did not reflect the priorities of all ten Canadian provinces. Instead, it endorsed Alberta’s policy, and called for intensity-based targets with no ceiling on greenhouse gas emissions.

Canada’s inability to agree upon a realistic climate change plan reflects its divided politics, with the present Alberta-based government of Conservative Stephen Harper raising doubts about the need to adopt any major initiatives, such as a cap and trade system, to meet its treaty obligations. Thus, understanding the provincial level is the real key for explaining Canadian environmental policy performance.

Provincial environmental initiatives

In response to these federal initiatives, several provinces continue to pursue stronger environmental controls, primarily under the WCI (Western Climate Initiative) framework. Lacking any leadership from Washington during the George Bush presidency, American states responded with two specific initiatives, the first being a cap and trade policy for the regional electricity sector in the north-east United States. California also initiated

discussions that led to the creation of the WCI and its above-noted cap and trade proposals for industry and consumer emissions.

Four provinces, Quebec, Ontario, Manitoba, and British Columbia, are members of the WCI and are moving forward with specific provincial programs. In 2007, for example, BC introduced an ambitious “zero-emission” policy for all new electricity plants, which ultimately led to the cancellation of several proposed coal and natural gas plants. In the same year, BC also passed the Greenhouse Gas Reductions Target Act, binding the province to reduce greenhouse gas emissions by 33 per cent by 2020 (below 2007 levels). In 2008, the province initiated several climate programmes, including tightened vehicle emissions, as part of the Greenhouse Gas Reduction (Cap and Trade) Act. The province also passed a Clean Energy Act in 2010 (Jaccard, 2010, 25).

Ontario passed its own Green Energy Act in 2009, with the goal of becoming another provincial leader on climate change in Canada. The Act failed to set specific policies for greenhouse gas pricing but did emphasize renewable energy, most notably wind, solar, bio-mass, and small hydro electricity projects. Ontario has also stated its commitment to introduce future policies on building and vehicle emissions (including public transit). As a further part of these initiatives, Ontario has discussed the possibility of a cap and trade system, likely in partnership with the WCI, as well as the goal of reducing emissions by six per cent (from 1990 levels) by 2014, and up to 80 per cent by 2050.

Quebec has also adopted aggressive environmental commitments, most notably by matching the European Union’s pledge to cut emissions by at least 20 per cent by 2020 (from 1990 levels). In addition, Quebec passed the Environmental Quality Act in 2010, which included controversial vehicle emissions standards. Specifically, starting in 2016, manufacturers will be charged a fine on all new vehicles that fail to meet provincial standards. The fine

The nature of Canada's rich resource base, as well as the concentration of the population close to the southern border, lent itself to a deep historical interaction with the US economy, in the process preventing the development of strong internal economic dynamics

will be based on a percentage of USD 5000 (=CAD). For example, if a vehicle exceeds provincial standards by one per cent, the fine will USD 50 per vehicle. (Walton and Seguin, 2010, A6).

It is important to note, however, that these provincial initiatives are not based on altruism. They are due to economic concerns related to future federal policies on climate change. Specifically, in 2009 the Harper government announced its intentions to cut emissions by 20 per cent from 2006 levels over the next decade. Although some critics were sceptical, other provinces understood that any cuts that did occur would not be Canada-wide. Instead, other provinces, and not Alberta and Saskatchewan, would be used to ensure Canadian compliance. As already noted, Alberta adopted an intensity-based system that only charged fines for emissions over already high target levels. Fees were also not applied to gasoline, home heating fuel and natural gas. Saskatchewan has reneged on its stated goal to reduce emissions 32 per cent by 2020, despite running a provincial surplus of USD 425 million in 2009 (White, 2009, A-9).

Ultimately, protection for emitting provinces will continue in the foreseeable future for two main reasons. First, 2010 mid-term elections in the United States returned control of the House of Representatives to the Republicans, thereby ending hope of any progressive environmental legislation in Congress by the Obama administration, especially related to cap and trade. Second, the Harper government was elected with a majority government in 2011, creating a similar dynamic within Canada's Parliament.

Reflections on Canadian experience for developing countries

The role of the Canadian government in green initiatives has developed over time as knowledge and values about environment and resources have evolved. Several aspects of this evolution contain potential lessons and tales of caution for developing countries whose economies are resource-oriented.

First, developing countries with federal systems of government have the potential of developing several competing central and sub-federal environmental policy initiatives, depending on constitutional guidelines. Developing countries should seriously consider the advantages of the multi-stakeholder, consensual approach

and local tailoring of initiatives while, at the same time, digesting the cautionary tale of the inability to reach national collective policies on larger goals.

Second, Canada presents a cautionary lesson for the difficulty of changing an economy with large regions still based on the exploitation of natural resources. Canada's deep integration with the US economy has been a key factor in the development of new resources from oil tar sands to diamond mines. As the staples theory suggests, the Canadian state has increasingly moved to support more value-added and processing of its resources.

Despite these efforts, Canada continues to struggle with transitioning workers and activities from declining industries such as coal mining, fisheries, and forestry towards new industries. In recent efforts, for example, the federal government has also attempted to generate commercial benefits related to green technology. They include Sustainable Development Technology Canada (SDTC)'s support for new technologies in a variety of areas, including clean energy through providing seed finance.

However, the levels of such finance pale in comparison with larger competitors such as the US and China, and such efforts are spread through logrolling throughout the provinces, further delimiting their ability to spin off new companies. The recent failure of erstwhile national telecoms champion Nortel underscores the point. Thus, there is good reason to be sceptical that Canada can significantly capture any new industries, including those in green areas, absent a significant increase in commitment levels, which the present government is clearly unwilling to entertain. It is nonetheless possible that, through the deep integration with the US and its highly capable workforce, Canada can capture some niches within production supply chains, as reflected in its participation in scientific and technology research, often through international consortia.

The question is, as for other smaller economies, how to translate those niches into areas of national expertise that will allow for creating employment in sustainable activities that will transform Canada.

Ultimately, Canadians will need to develop a post-staples view of resources, beyond short-term monetization - one which sees the their multiple uses and value, including preservation for future generations ◀

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The development of the Federal Government's National Action Plan on Climate Change in 1993, with its goal of stabilizing greenhouse gas emissions by the year 2000, also exposed distinct differences between provinces, especially those dependent on carbon-based exports, such as Alberta, and others, namely Quebec, with "cleaner" hydro power

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The Clean Revolution: a vision for a better, cleaner, more prosperous world

Mark Kenber

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In this article, Mark Kenber outlines how a Clean Revolution is the only viable way to avert catastrophic climate change and ensure that the nine billion people on the planet by 2050 will not only subsist – but thrive. Kenber provides an array of examples on how governments and businesses are already responding to the challenge by employing clean, low-carbon technologies and new business practices. He stresses the importance of leadership and vision on achieving transformational action on the low carbon economy and bringing about a cleaner, smarter, better world.

It is nearly 40 years now since the international community first came together to discuss humanity's impact on the environment. At the 1972 UN Conference on the Human Environment in Stockholm, over 100 countries signed a declaration intended "to inspire and guide the peoples of the world in the preservation and enhancement of the human environment."

In the intervening years, our knowledge of the physical world and the impact our species has on it has increased dramatically. The rise in environmental awareness amongst the public and the emergence of green politics has shown that societies have also responded in kind. Milestones such as the 1987 Brundtland Report, the Rio Earth Summit in 1992, and the Kyoto Protocol five years later have slowly but surely made the environment a mainstream political issue. Businesses too have responded, with greener products, more sustainable and efficient supply lines, and the integration of environmental issues into the management process. The world is undoubtedly a better place because of these changes, brought about by the resourcefulness and ingenuity that are the hallmarks of humanity.

And yet despite our best intentions, our goal of a truly sustainable world, which balances economic needs with environmental capacity, is yet to be met. Indeed, the fundamental driver of our modern economies, our energy system, remains based on climate-warming fossil fuels. Despite being a decade into the 21st century, the way we heat our homes, power our industry, and transport ourselves, remains reliant on a system first developed in the 18th century. With a global population set to hit nine billion by 2050, and the impacts of climate change becoming clearer, such reliance is unsustainable. We have to move on and embrace a new way of producing and consuming energy. In short, we need a Clean Revolution.



What is the Clean Revolution?

Any successful process of change depends on demonstrating the benefits such change will bring. It is about communicating a positive vision of the future.

The Clean Revolution is a process involving a radical increase in energy efficiency and the large scale deployment of existing, emerging, and yet-to-be developed low-carbon energy technologies. It is a future where renewable energy sources (wind, solar, marine) provide the bulk of our energy needs, while transition technologies, such as carbon capture and storage (CCS) wean us off our 300 year-old fossil fuel addiction. It is a future where off-grid communities have gained energy independence and opened up new economic opportunities through self-contained renewable energy schemes. It is a future where personal transportation has been electrified, removing pollutants from city streets and enhancing energy security for local and national economies. It is a future where ultra-energy efficient products such as LED lighting, and green buildings have dramatically reduced our consumption of energy while maintaining our economic prosperity and improving our well-being.

This is also an urban future. The population of the world's cities will almost double by mid-century, which is equivalent to all the urban development in all of human history being duplicated in little more than half a life-time. In 1800, only 2 per cent of the world's population was urban. As we end the first decade of the "urban millennium", half of the world's people are living in towns and cities, with 180,000 people added to the urban population each day. The predicted global urbanization rate in 2030 is 75 per cent.

Most importantly, however, the Clean Revolution is about a future where there are no longer two billion people without access to electricity. It is a future where rural women in West and Central Africa have no need to spend two hours per day manually collecting and carting water. It is a future where the productive day of 500 million Indians is no longer limited by the hours of daylight.

The Clean Revolution is in short a vision of an increasingly urbanized world well on its way to achieving economic, environmental and social sustainability, through the application of smart, clean, low-carbon technology and new business practices. We have a unique opportunity to help what will soon be nine billion people not to subsist – but to thrive.

A fast changing world

Getting to this prosperous future is not a given, however. It will require major shifts in our production and consumption patterns. It means recognizing the rapidly changing world in which we live and the fact that business can no longer be as usual.

Today we live in an era that is witnessing a level of growth without parallel in human history. In the next 20 years, China alone will build another "United States" in terms of homes and commercial buildings. At the same time, the world will shift from having less than two billion rich or middle class people today (primarily in Europe and North America), to more than three billion by 2020 and five billion by 2030. By 2020, 70 per cent of China's population

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The Clean Revolution is a future where renewable energy sources (wind, solar, marine) provide the bulk of our energy needs while transition technologies such as carbon (CCS) capture and storage wean us off our 300 year-old fossil fuel addiction

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will be middle class. Some projections suggest that the global economy may triple in terms of purchasing power parity in just 25 years and more than quadruple in real dollar terms by mid-century. Raising the prosperity of so many people will be an extraordinary achievement.

But this growth will come with extra demand for resources. Demand for food, for example, is expected to increase by 50 per cent between 2010 and 2030 and water demand by 40 per cent over the same period. The International Energy Agency (IEA) has predicted that energy use will increase by around 23 per cent by 2025. BP expects the figure to be closer to 40 per cent by 2030. Squaring these demands with supply will be one of the key challenges over the coming decade and beyond. The good news is that the opportunities for efficiency improvements are substantial.

Consider the average American household. Nearly 5 per cent of its budget is spent on gasoline, yet three quarters of the energy in this fuel is lost as heat. This inefficiency is compounded by the generally low level of fuel efficiency in the US car fleet. In the home, Americans waste 14 per cent of their food purchases, including leftovers and out of date products. The average family of four throws out close to USD 600 per year in fruit, meat and vegetables. This breaks down in landfills into methane, a potent greenhouse gas if not captured. Inefficient appliances and lighting add to the wastage at home. Traditional incandescent lights, for example, convert only 5 per cent of electricity into useful visible light, with remaining 95 per cent lost as heat. Americans are, of course, by no means alone with similar inefficient resource use replicated to varying degrees around the world.

Technological, behavioural and business management fixes are already available to address these and other inefficiencies. They will certainly be needed. By 2050 the carbon intensity of our global economy will need to be less than one-tenth that of today. Economic growth of the future will need to be carbon-negative.

The IEA estimates that in order to halve global emissions by 2050, we will have to deploy the equivalent of the following every year: 30 nuclear power plants, 15,000 wind turbines (4MW), the equivalent of two-thirds of the Three Gorges dam in hydropower, more than 50 gas and CCS plants (500MW), more than 50 concentrated solar

power (CSP) plants (250MW), and more than 300 million square meters of solar photo-voltaic (PV) panels. The IEA assumes nearly two-fifths of required action is delivered through energy efficiency

Recent reviews suggest that current policies and targets on the table will leave us on track for a dangerous 4°C of warming even if they are fully implemented. Globally there is still a significant policy gap.

But change is what we do (although it is not always easy)

Fortunately, humans have a history of making big changes that have made the world a better place – even when it wasn't popular at the time. As US historian, Howard Zinn noted: "There is a tendency to think that what we see in the present moment will continue. What leaps out from the history of the past hundred years is its utter unpredictability." The fall of the Berlin Wall, the end of Apartheid and, most recently, the Arab Spring are concrete examples of Zinn's insightful observation.

We also have a history of directing change when the political will or business opportunity exist. Take smallpox, a disease which caused humanity misery for millennia. In the 1950s, 50 million people a year still contracted smallpox despite the availability of a vaccine. After a concerted international effort directed through the World Health Organisation, the figure had dropped to zero by 1980. The recent IT revolution provides further examples of rapid and profound change. In India, 20 million new mobile phone users are signed up every month. This is in a country where even today there are only 35 million land-lines for its 1.1 billion citizens. In less than a generation, India has leap-frogged across a technology divide.

Although our ability to make quantum leaps should not be underestimated, the reality is that people often doubt change and are sceptical about the introduction of new ideas. History is littered with amusing examples. Take Sir William Preece, Chief Engineer for the British Post Office who stated in 1878 that, while "Americans may be in need of the telephone, Britons are not. We have plenty of messenger boys". In 1895, Lord Kelvin, British mathematician and physicist, and one of the most eminent scientists of the 19th century, declared "Heavier-than-air flying machines are impossible." Eight years later the Wright

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Growth will come with extra demand for resources. Demand for food is expected to increase by 50 per cent between 2010 and 2030. Energy use will increase by around 23 per cent by 2025. The good news is that the opportunities for efficiency improvements are substantial

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brothers made history at Kitty Hawk. And, in 1976, the president of computer company Atari, told a young Steve Jobs “get your feet off my desk, get out of here, you stink, and we’re not going to buy your product.”

Even electricity - so essential to our modern economies - was fiercely resisted when this “disruptive” technology was first introduced in the US. Thomas Edison’s electrification of society is the prototypical example of successful innovation. In Edison’s time, efforts to bring electricity to market were fiercely contested by an entrenched gas industry that mobilized its political power and economic heft against his new venture. Ultimately, however, the electrification of cities prevailed through a combination of Edison’s own business acumen, the growth of new industries such as automobile manufacturing that utilized electricity, and the general flexibility with which electricity could be put to use.

The Clean Revolution is not only possible – it is already underway

Our past experience of technological change should give us the confidence to take ambitious steps in making the Clean Revolution a reality. Entrepreneurial leaders in a range of industries and in government are already leading the way. The Clean Revolution is not some distant goal: It is a process which is rapidly gaining momentum. The energy sector is a case in point.

In 2009, we neared a tipping point in energy production. Globally 47 per cent of new energy capacity was from renewables and 53 per cent from fossil fuels. In Europe, 62 per cent of power generation capacity added in 2010 was from renewable energy. The continent is broadly on track to provide close to 35 per cent of electricity from renewables by 2020. Globally, wind power capacity grew by nearly 65 per cent between 2006 and 2008, reaching 120GW. Grid-connected solar PV capacity more than doubled in the same period, reaching 13GW, with PV module prices falling 50 per cent in 2009 alone. Renewable energy is projected to supply 20 per cent of global power by 2020, up from 6.2 per cent in 2008. Unsurprisingly, the market capitalization of the 86 largest renewable energy companies reached USD 216 billion in 2010, up from USD 50 billion in 2005.

Major changes are also underway in the transport sector. In the entrepreneurial tradition of Henry Ford, who famously said, “If I had asked my customers what they wanted, they would have said a faster horse”, a growing number of companies are pioneering the shift to electric vehicles (EV).

In the US, Tesla, the company that re-invented the image of EVs with its high performance Roadster, is now designing a mid-sized family car. A successful public share issue in 2010 raised USD 266 million in new capital, underlining investor faith in the company’s future. Japanese car manufacturer Nissan, meanwhile, has launched the first fully electric vehicle built for mass production. The Nissan Leaf has a top speed of more than 90 mph (145 km/h), a range of 100 miles (160 km) on a full charge, and a fast-charge time of 15-30 minutes. Fifty thousand cars are expected to be produced each year from 2011.

The EV revolution is also inspiring new business models within the transport sector. Better Place, an Israeli-based company, is introducing a battery swap system, which replaces depleted batteries with fully charged ones at dedicated service stations. The key advantage of this system is that it allows a car to be ‘refuelled’ in minutes, not hours. Better Place is rolling out this model in Israel, Denmark and a range of other locations. With expected per mile fuel savings of up to 70 per cent compared to conventional cars, the company sees major opportunities, particularly with the continuing high oil price.

Clean transport is not just about electric cars, however. In the Netherlands, 19,000 km of cycle lanes have created a transport system where 27 per cent of all journeys are by bike. To put that in perspective, the UK figure is 2 per cent. The Brazilian city of Curitiba, meanwhile, has led the development of Bus Rapid Transit systems over the last 30 years. The city’s system is used by two million passengers a day, reducing pollution and congestion. Other cities in the region have now copied the system. Technology is also changing business travel. Cisco, the IT-solutions company, reduced its travel emissions by 40 per cent between 2006 and 2009 through the introduction of its own video-conference system, Webex.

Other business sectors are seeing similar levels of innovation. In the lighting sector, which accounts for 19 per cent of world electricity use and is linked to 10 per cent





Schoolchildren in Bobo-Dioulasso, Burkina Faso (11°10'N, 4°18'W)
© Yann Arthus-Bertrand / Altitude - Paris

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As we end the first decade
of the "urban millennium",
half of the world's people are
living in towns and cities,
with 180,000 people added
to the urban population
each day

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of world CO₂ emissions, LEDs were laughed at five years ago as replacements for compact fluorescent and traditional incandescent bulbs. Today, you can buy an LED light at Home Depot for USD 20. It will last you 46 years.

Entrepreneurial businesses are also developing products to put personal energy management in the hands of the consumer. A range of companies now produce home energy monitoring kits that allow consumers to make substantial savings on electricity bills by providing real-time data showing exactly how, when and where energy is being used in a household.

Smart grids are beginning to be established too. These combine advanced sensing technology, two-way high-speed communications, 24/7 monitoring, analysis software, and related services. This provides location-specific, real-time information about the status of the electricity grid, giving consumers control over their energy usage and enabling the widespread deployment of renewable energy sources.

Advances are also being made in packaging. Coca Cola, for example, has introduced the PlantBottle, a fully recyclable plastic bottle made up of 30 per cent plant-based material. The plant material is a by-product from sugarcane processing, meaning that it utilizes an existing biomass stream, rather than creating demand for new ones. With the US alone manufacturing 25 billion plastic bottles in 2008, Coca Cola's shift towards more sustainable packaging of this kind is essential to reducing pressure on scarce resources.

The Clean Revolution is more than clever new technologies, however. As Harvard Business School Professor Clayton Christensen, a leading authority on disruptive technology notes, "the most common misconception about disruptive innovation is that the disruption is caused purely by the technology. Characteristics such as features and functionality are certainly important. But

it's the business model—the pricing, cost structure, sales process, and so on—used to commercialize the technology that's truly critical."

Given all these advances in technologies and shifts in corporate behaviour, it is perhaps unsurprising that investment into the various strands of the Clean Revolution is accelerating. Between 2004 and 2009, annual investment in global clean energy increased nearly five-fold from USD 35 to USD 163 billion. In the first quarter of 2010, USD 2.9 billion of venture capital and private equity investment was made in clean technology, the largest first quarter investment in history, according to Bloomberg New Energy Finance.

Real progress is clearly being made then, but we should not be complacent. Fossil fuel use remains dominant, with global trade totalling USD 3 trillion in 2008. Such dominance comes at a cost for many economies, including the biggest. According to analysts, the US spent USD 440 billion on oil imports in 2008, a payment described by some as the largest transfer of wealth in human history.

The importance of Clean Revolution leaders

With much still left to do to end our fossil fuel addiction, the need for Clean Revolution leaders is more important than ever. This means rejecting incrementalism and thinking big. Thankfully, there are already individuals, businesses and governments doing exactly that.

Take individuals like Shai Agassi, founder of Better Place, the late Ray Anderson of flooring giant Interface, or Zhang Zue, of Broad Air Conditioning. Each in their own way has created a company where sustainability is not some marketing add-on, but a core part of their business philosophy and day-to-day operation. From developing a systems' approach to car ownership, introducing closed-loop manufacturing into the flooring industry, or producing air conditioners 200 per cent more efficient than



conventional models, each of these business leaders have demonstrated that economic and environmental sustainability are not mutually exclusive goals.

At the government level, many leaders of national and sub-national entities are starting to realise the opportunities from developing low-carbon energy resources in their jurisdiction. The Government of India intends to establish a solar power equivalent to California's Silicon Valley. It has set a target of generating 20GW of solar energy by 2020. India's wind generation potential is also to be tapped. The sector already produces over twice as much energy as nuclear. China's recently released 12th Five Year Plan includes multiple provisions to accelerate seven strategic emerging industries. The majority of these focus on low carbon technologies. Much of the thinking behind this is driven by development needs, energy security and concerns about competitiveness. China wants its economic activity to be more valuable, to create an export market for high value technologies and to reduce its own reliance on inefficient infrastructure and fossil fuels.

State and regional governments also understand the first mover advantage. Scotland has set a target to produce 100 per cent of its electricity from renewable sources. The federal German state of North Rhine Westphalia aims to have 250,000 EVs on the road by 2020. And California is leading US climate action efforts with its ambitious carbon reduction initiatives.

The implications of this transition away from fossil fuel-based economies to clean energy ones, raises many questions for business and government leaders. Business and government leaders, will need to ask how will they compete in an increasingly resource constrained world. How will they re-invent their business/state/city for the 21st century citizen? Politicians will need to respond to the demands of an emerging generation increasingly concerned about climate change and the impacts it will have on them over their lifetime.

If we are to reach that goal we set ourselves some four decades ago of preserving and enhancing the human environment, our political, business and civil society leaders must have a shared vision of a better future. We do not have to know exactly what the future will look like or have the precise road map for getting there. But we will know that everything we touch, see and feel will be zero per cent carbon. Zero per cent waste. One hundred per cent opportunity. It will be a smarter, greener, cleaner world - a better world. And it is this vision of a better world, created by a Clean Revolution, that should drive everything we do ◀

*"The difference between what we do
and what we are capable of doing would suffice
to solve most of the world's problems"*

MAHATMA GANDHI



Mark Kenber

Mark Kenber is the CEO of The Climate Group. He has worked on climate change for fifteen years and is an expert on international climate policy. Before becoming CEO, Mark was The Climate Group's Deputy CEO (2010) and International Policy Director (2004-2010). Mark advised former UK Prime Minister Tony Blair in the joint policy initiative Breaking the Climate Deadlock (2008-2009). Immediately prior to joining The Climate Group, Mark was Senior Policy Officer for WWF's International Climate Change Programme. He has also served as Director of Planning at Fundacion Natura of Ecuador and Climate Change Advisor to the Ecuadorian Government. Mark currently sits on the Climate Change Advisory Council at Zurich Insurance (since 2009), BP's target-neutral Assurance and Advisory Panel (since 2007); the Climate Policy Editorial Advisory Board (since 2005); and the Institutional Investors Group on Climate Change Steering Committee (since 2005).



Time to reflect, refocus, reinvigorate

Michael Liebreich

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Michael Liebreich argues that Rio+20 offers an historic opportunity to divert the world's economy away from its current resource-intensive, environmentally and socially destructive pathway and towards something approaching sustainability. First, he says, leaders must acknowledge the successes and failures of the past 20 years. Then, bearing in mind the brief period remaining before Rio+20, they should urgently focus their attention on workable solutions in three areas: mainstreaming the green economy agenda; accelerating the shift to clean energy; and creating a workable large-scale climate finance framework.

With Rio+20 now only months away, the world urgently needs a compelling vision for sustainable growth for the next twenty years. Any such vision needs to bring together an integrated set of actions covering the general economy, the energy industry and the specific challenges relating to climate change.

Mainstreaming the green economy

Perhaps the biggest challenge facing the participants in Rio+20 is to make sustainability relevant to mainstream business and mainstream consumers.

Fifty years after Silent Spring, 20 years after the Rio Earth Summit, it is surely time to accept that “green”, “sustainable”, “eco” and “clean” are simply not brands that can be sold to everyone.

Mention sustainability and survey after survey shows that around 15 per cent of the public are engaged, 70 per cent are passively supportive, and 15 per cent are downright hostile. The numbers may vary – in the US right now the debate is unusually polarised – but the shape of the response does not. Investors are no different. If a chief executive talks about sustainability and green initiatives, 15 per cent of investors respond positively, 70 per cent don't mind as long as the CEO is not spending money, and 15 per cent are downright hostile. But if that same CEO talks about resource efficiency – trying to do more with less – then there is not an investor in the world who will not listen with interest.

In order to engage consumers and business across the very broadest of fronts, the green agenda needs to be restated in terms that will resonate with everyone – and the only realistic way of achieving that is to restate it in terms of resource efficiency.

Of course scarcity itself will continue to drive up resource prices, and there are those that argue nothing more needs to be done in order to improve efficiency. The fact is, however, that there are interventions that could speed up the process. These would start with broad mandated disclosure requirements on usage: transparency alone will spur change. The media, non-governmental organisations (NGOs), citizens and consumer advocacy groups have a vital role to play, particularly given the extraordinary trends in social networking and crowd-sourced data. Disclosure would be supplemented by provision of concessionary finance for those without access to capital, rules restricting public procurement to above-median performers, and regulation to deal with industries that refuse to engage in the agenda.

Resources can be broadly defined to include energy, natural resources, agricultural land, water, space in landfills or clean air. Even less-obvious commodities like broadband spectrum, road space, parks and other shared amenities could be subject to the same treatment. All are scarce, all are of concern to consumers, business leaders and investors. And the issue of resource efficiency can be made to resonate in developed and developing countries alike.

Those who say Africa should not yet worry about energy efficiency, only about energy access, could not be more wrong: the more efficiently you use energy, the less you have to invest in its generation. The world's energy poor have a right to energy services: light, heat, power for their businesses; they do not have a right to build the same inefficient infrastructure as we are saddled with in the developed world.

An aggressive focus on resource efficiency would have the virtue of being self-financing, so rewards would be not only environmental and geopolitical, but also financial. It would be a classic win-win-win – except, of course, for those whose wealth is contingent on our continued profligacy.



Accelerate the clean restructuring of the energy industry

The second area where Rio+20 can play a decisive role is in accelerating the shift to clean energy. The world has already begun a long-term, profound shift towards reliable, cheap, clean energy. Emerging trends – in terms of cost, installation volume and share of supply – are already abundantly clear for anyone who cares to look. Investment in clean energy has soared from around USD 50 billion in 2004 to just under USD 250 billion in 2010, a compound annual growth rate of 30 per cent. Investment in new, renewable electricity generation capacity has already all but overtaken that in fossil generating capacity.

Even without subsidies, power from onshore wind can cost as little as USD 6 cents per kWh, which means today's best wind farms produce power at the same cost as a new state-of-the-art coal or gas plants – and that is before assuming a carbon price. Landfill gas and municipal solid waste can produce power for as little as USD 5 cents per kWh. Geothermal power starts at around USD 8 cents per kWh. Biomass-based electricity can come in under USD 10 cents per kWh: a bit higher than coal, but not more than natural gas in most of the world. Meanwhile sugar-cane based ethanol provides just under half of the fuel for cars in Brazil – competitive with oil at around USD 50 per barrel.

Solar photovoltaic (PV) power prices have fallen by around 70 per cent since 2008. A PV project in a sunny location can now produce electricity for USD 17 cents per kWh (without subsidies). Solar thermal starts around USD 20 cents. Although it may take another decade or more for solar power to become fully competitive with fossil-based electricity, as of this year, rooftop PV is already cheaper than daytime household power prices in significant national markets such as Turkey and Italy, before subsidies. By 2015, the same will be the case in most sunny

countries. Meanwhile in the developing world millions of families are dumping kerosene lamps in favour of solar power each year – they do not need subsidies, all they need is access to microfinance and someone to sell them the equipment. Wind-solar-battery micro-grids and other clean solutions are replacing diesel generators across India, Africa and Latin America – again, not because of subsidies, just because of the high cost of oil.

Even the cost of intermittency is not as high as people think. Spain derives over 20 per cent of its electricity from renewable energy, more than half of it from wind, yet the country's grid operator estimates the cost of intermittency at no more than EUR 1.80 per MWh, which is around 3 per cent of wholesale power prices and lower than monthly volatility in oil or coal prices.

All of these figures are in the public domain (though subjected to withering critiques by those who do not like the implications), and prices continue to come down. Over the next decade, the cost of lithium-ion batteries will drop by 75 per cent. The cost of solar PV will drop another 50 per cent. The cost of LED lighting – which uses 10 per cent of the energy of filament light bulbs – will drop by 90 per cent. The cost of demand management will drop by 50 per cent. The cost of wind power will drop 25 per cent. The first mass-market electric vehicles are only just reaching dealers' lots, as are plug-in hybrids, which go 1000 miles before needing a trip to the gas station. The first commercial plants making biofuels from plant waste are coming on line. Butanol and other chemicals can now be produced more cheaply from bio-feedstocks than from oil. A plane has crossed the Atlantic using a 50 per cent biofuel blend. High-voltage power electronics could eliminate 90 per cent of transformer losses.



Sugar-cane based ethanol provides just under half of the fuel for cars in Brazil – competitive with oil at around USD 50 per barrel



Innovation is accelerating, not slowing down. Individual elements of the clean energy revolution also reinforce each other. Low-cost, low-power lighting and appliances mean available renewable energy resources can meet local needs instead of falling short. Mass uptake of electric vehicles will enable the storage of power from solar and wind. Infusing the energy system with sensors and digital controls will not only drive a step change in efficiency, but at the same time reduce the cost of managing the only real downside of renewable energy – its intermittency.

Of course many questions remain in the shift to clean energy. What will be the exact mix of renewable technologies by region and application? How much can be achieved by energy efficiency? What will be the role of nuclear power in a post-Fukushima world? What role will shale gas play? Its arrival on the scene is highly significant and welcome, but there are big questions about its long-term environmental impact and its economics, given that there is limited data as yet on long-term productivity of ‘fracked’ wells.

The shift to clean energy will pose geopolitical and macroeconomic questions too. Which countries will be long-term winners and which will fight the trend and be losers? Will the shift to clean energy reinforce or reduce economic and trade imbalances? How will fossil fuel exporters react as clean energy acts, first, to cap prices, and then eats progressively into demand? Will the sheer volume of stranded assets – tar sands and coal mines, the wrong sort of power stations, oil wells under the Arctic and a transport infrastructure dependent on vanishing supplies of cheap oil – cause the next financial crisis? Or the next but one?

But the biggest question of all is how long the shift to clean energy is going to take. For, while the shift is inevitable, its speed is by no means decided. This is an industrial revolution which will take decades – but how many? This is where Rio+20 comes in.

Design policy to drive down the cost of clean energy

In order to accelerate the shift to clean energy, policy mechanisms need to help drive down its costs rather than create long-term protected markets for particular technologies.

The point has been made endlessly over the past few years that support for clean energy needs to be “Long, Loud and Legal”, and that clean energy investors need “TLC: Transparency, Longevity and Certainty”. To date, clean energy has been significantly held back as policy-makers waver between support and laissez-faire policies. Energy technologies are not like pharmaceuticals or software: they are as much about heavy engineering as intellectual property. Deployment at scale is required in order to drive process improvement and develop efficient supply chains. Those who voice support for clean energy but suggest technologies should stay in the lab until they are fully competitive are false friends: they have fundamentally misunderstood the drivers of industrial cost reduction.

Although there is a categorical need to support deployment of clean energy technologies while they mature, which can take an extended period of up to two decades, history has shown that innovation thrives on deregulation, not on regulation. Feed-in-tariffs are nothing more than price controls. Around the world we have seen the prices for solar and wind equipment absorbing whatever feed-in-tariff is set, and failing to drop fast enough to keep up with falling costs. The simplicity of feed-in-tariffs may make them necessary for retail markets but in wholesale markets they cannot be justified. Renewable portfolio standards, meanwhile, are nothing more than the centrally-planned creation of protected markets. That is not to say there is no role for these mechanisms, but that their use needs to be a different sort of TLC: Temporary, Limited, and Careful.

The number one imperative for the clean energy sector should not be political lobbying or rolling out current generation technology at any cost or creating jobs. It should be to push down costs, consistently and for the long term. Do it successfully and all the other potential co-benefits will flow; fail to do it and hard-working consumers and tax-payers will rebel, and rightly so. All clean energy policy must therefore be designed to have market-based price discovery at its heart.

Driving down the cost of clean energy also means driving down the cost of finance – mainly, given the levels of leverage used for infrastructure projects, the cost of debt. The difference between debt at 6 per cent and debt at 10 per cent is the difference between a viable wind farm and one that does not get built. To date, too little attention has been paid to the impact of policy design on the cost of

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finance. Politicians ladle on rewards with one hand while increasing risk with the other: taking away in increased financing cost the very returns they are trying to provide in order to attract investors.

Eliminate fossil fuel subsidies

At least as important as smart policy in support of clean energy is the need to eliminate subsidies for dirty energy. The International Energy Agency (IEA) estimates that fossil fuels benefited from USD 312 billion of production and consumption subsidies in 2009, against an equivalent figure for clean energy of just USD 57 billion. Eliminating these distortive subsidies would cut the growth in energy demand through 2020 by 5 per cent, equivalent to the entire fossil fuel consumption of Japan, the Republic of Korea and New Zealand.

In fact, these figures underestimate the scale of the problem. They do not include the impact of a number of externalities and structural biases which act against the introduction of new clean energy technologies:

- ☞ Health costs associated with fossil fuels – especially coal and kerosene – which are paid for either directly by the public or by general taxation via ministries of health;
- ☞ Defence costs associated with securing oil, coal and nuclear supply chains, paid for by general taxation via ministries of defence and homeland security;
- ☞ The cost of energy price volatility, borne by the economies of fossil-fuel importing countries. It is clearly a significant factor, given that each global recession for the past 40 years has been preceded by an oil price spike;
- ☞ Subsidies to energy-intensive industries. While these have historically been seen as a way of supporting growth, in a high energy-price world they are a way of bleeding a country's economy dry; tragically many politicians and economists do not appear to have noticed;
- ☞ And, of course, carbon emissions. Without rehearsing the science behind climate change or the costs of CO₂ impacts, it is beyond reasonable doubt that

greenhouse gases are causing damage for which their emitters are not paying.

It is economic madness to support clean technologies and at the same time subsidise the very fossil fuels they are meant to replace. The fact that these distortions have been allowed to persist and even grow over time is not so much a failure of the market as a failure of leadership.

At the G20 Summit in Pittsburgh, world leaders committed to “rationalise and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption”. What is needed is aggressive follow-up on that statement, not negotiations over the meaning of the words. Rio+20 has a vital role to play.

Remove regulatory barriers to clean energy deployment. Finally, to accelerate the shift to clean energy we need to systematically identify and remove legislative and regulatory barriers which are holding it back.

One area in particular stands out: that of utility regulation. But around the world the rule book has been designed around reliability of supply and keeping prices low, with environmental performance added as an afterthought. It has been rendered all but obsolete by three factors: it is now cheaper to assure reliability of supply by pervading the grid with intelligence, rather than by the brute force of overcapacity; consumer focus is shifting from low unit energy prices to low energy bills; and environmental constraints have become so various and so stringent that the only way to meet them economically is to design them in from the start.

Decades of regulation designed to protect consumers from local monopolies has had the exact opposite effect. Power sales are restricted to utilities. Energy efficiency hits profits. Smart meter investment cannot be recouped. Electricity markets overly penalise intermittency. Net metering, where it exists, provides for one buyer and a regulated price. Countries and states lack agreements on commerce and interconnection. The list of market distortions and barriers to the introduction of new technology is endless. How can we expect technological innovation in this environment? The utility sector today is like the telecoms sector in the 1980s – frozen like a rabbit in the headlights of new technology, and with powerful incumbents arguing that change is far too risky to contemplate.



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The green agenda needs to be restated in terms that will resonate with everyone – and the only realistic way of achieving that is to restate it in terms of resource efficiency

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Utility regulation needs to be rethought from first principles. Consumers do not have a right to low unit energy prices, they have a right to low bills. They don't have a right to grid connections, they have a right to reliable energy supplies. And everyone, everywhere in the world, has a right to energy that has been produced safely – not short term, not long term, not locally, not globally – always and everywhere.

The new regulatory regime needs to reflect the fact that new technology enables the introduction of competition in every area of energy provision; not just in power generation, or in billing, but in things like voltage regulation, back-up power, management of intermittency, additions to the grid and investment in energy efficiency. We are entering a new era of competition between electricity, natural gas, renewable energy and energy efficiency. Heat pumps allow electricity to compete with natural gas and oil for heating loads – if they are not first captured by solar hot water. Electric vehicles allow electricity to compete with oil on its home turf. A new generation of distributed generation technologies – based on fuel cells or conventional approaches – will allow natural gas to provide real competition in delivering energy to the home. Even the last-mile connection to the grid, which has for the past 150 years been a natural monopoly, is no longer so. A combination of extreme efficiency, local renewable generation and power storage offers a realistic opportunity of off-grid living in many locations for the first time in nearly two centuries.

The energy sector is also affected by generations of regulation in areas such as safety, reliability, energy poverty, commerce, trade and so on. Any new technology stands at an enormous disadvantage. Planning processes favour incumbent technologies. Projects require permits from dozens of agencies. National parks prohibit exploitation of resources. There are gaps in standards for new technologies, and agencies lag in certifying new manufacturers. Building codes create barriers for new technologies. Trade agreements thoughtlessly apply tariffs. Small businesses are excluded from government contracts. Appliance standards gloss over environmental performance differences. Mortgage structures render energy service contracts invalid. In all of these areas, barriers to the rapid shift to clean energy need to be identified and dismantled.

Financial regulation too needs to change. Pension fund managers endlessly point out they can't invest in clean

energy because it is risky. For sure, the sector is subject to a complex and dynamic set of regulations – but is this really any different from telecoms, health care, aviation, or indeed other parts of the energy industry? The Wilder-Hill New Energy Global Innovation Index (NEX) of clean energy stocks began life at 100 in 2003, reached 450 by the end of 2007, slumped to 135 in March 2009 and then recovered to just under 200 now. Volatile, to be sure, but it has nevertheless delivered a compound return of nearly 9% per annum over the period, considerably outperforming the Standard & Poor (S&P) 500.

Meanwhile, during this period, not one clean energy investor has woken up to find one of his or her investments has been responsible for the next Deepwater Horizon, Exxon Valdez, Upper Big Branch Mine disaster, or Fukushima meltdown. In February 2011, unseasonably cold weather resulted in rolling electricity black-outs across Texas. Critics immediately blamed the amount of wind power in the state. The real culprit? The drop-out of 7,000 MW of coal-fired generation due to frozen pipes.

Helping investors understand long-term risks posed by climate change is too theoretical to change the actions of today's portfolio managers. Why should they care if sea level rise in 50 years renders one of their investments worthless? They will be long retired. What front-line portfolio managers are missing is the immediate, significant and growing risk to their holdings which is posed by the current energy system. They have an obligation to protect their clients' savings; and if they will not do so voluntarily, then it is the responsibility of financial regulators to compel them.

Finally, while we are removing distortions that hold back clean energy, we also need to look at the issue of trade. In his article, Peter Brun describes the principles behind a Sustainable Energy Free Trade Agreement (SEFTA), whereby tariffs on clean energy products, services, feedstocks and output are removed, technical standards are agreed, local content rules are abolished and competitive subsidies eliminated. What more fitting way to unify right and left of the political debate than in unleashing the forces of globalisation to the benefit of a cleaner economy, rather than to its detriment? SEFTA could start with the G20 countries, but expand from there, and could be designed to operate within WTO rules. We should admit that the Doha trade round is going nowhere, the focus

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of 30 per cent

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our efforts on SEFTA, which offers so much benefit to every country in the world.

Addressing these barriers to clean energy deployment would not generally even cost public money. Very often, however, it would entail taking on powerful interests – requiring the expenditure of political, rather than financial capital. Are the political leaders who will attend Rio+20 ready for the challenge?

Climate finance

The final area in which Rio+20 could spur a step change in outcomes is in the area of climate finance. While Copenhagen did not result in a global cap on emissions or a global carbon price, it did result in the commitment by the developed world to provide USD 100 bn of funding to the developing world each year by 2020. In Cancún, further progress was made, with agreement that a Green Climate Fund would be established, which would manage “a significant portion” of these adaptation and mitigation funds. Achieving USD 100 bn of investment by the developed world in the developing world is feasible, under the right conditions. However, before describing how it might be achieved, there are again some home truths that need to be stated.

First, Kyoto is dead. The developed world simply will not perpetuate any deal which caps their emissions and leaves the developing world entirely untrammelled. The idea that there is one group of countries that should pay for climate change forever, and another that does not, was always absurd. If in doubt, fast forward to 2050 and calculate where the bulk of cumulative historic emissions will have come from under almost any scenario. Answer – China and India. Of course there can be a face-saving deal whereby the Kyoto Protocol is preserved; but let us be clear, it will be in name alone.

Second, linking everything to everything makes it an order of magnitude harder to achieve progress. The climate problem is mainly an energy problem – which means essentially an engineering problem. Of the remainder, the bulk of it is a forestry and land use problem – which means essentially a social problem. Keep them separate. Adaptation, by contrast, is essentially a justice problem. We really should be looking at creating separate adaptation funds, with contributions proportional to historic emissions. Providing climate loans to help countries deal

with problems of the developed world’s causation, then charging them interest, is immoral. Charging them interest for solutions which help mitigate future emissions, on the other hand, is not.

Third, interventions have to be politically feasible. I understand the challenging task faced by the High-Level Group (HLG) which fed into the Cancún negotiations; but what is the point of advocating a global tax on shipping and aviation and a global carbon price when there is zero chance of these being adopted by key players in the current political cycle – possibly ever? We must remain in the domain of the achievable and focused on practical solutions, not posturing. In particular, it should be noted, solutions have to be politically feasible in the countries which are providing the funds. Unless their voters support any deal, no deal will be ratified, and no funds will flow. There is no point in designing a Green Climate Fund to receive and manage USD 100 bn of government-to-government funding when no such amount will materialise.

Finally, to attract private finance on a truly large scale, solutions have to be brutally simple. If you want mainstream businesses to participate, you need to insulate them from all talk of NAMAs, CERs, VERs, ERUs, DNAs and DOEs, REDD+, additionality, climate bonds and so on. A good rule of thumb: if it needs a glossary, you can forget about retail investors and the financial institutions that serve them. The Clean Development Mechanism was enormously complex, administratively costly and open to manipulation; it also left developers with the risk of carbon price volatility. Meanwhile, public-private partnerships (PPP) only resonate with people if they are tightly defined. If you want to use the term PPP, you have to be clear: do you mean regulation which steers the flow of private investments to generate public good, or public tendering for the provision of infrastructure and services? Or public sector investment in companies and projects? Or some mix of all of these approaches?

Blueprint for a Green Climate Finance Framework

Any solution which routes USD 100 bn of finance to the developing world for climate-related initiatives will be made up of a mix of public and private money, with private money predominating. The Green Climate Fund will not be a World-Bank-style fund, replenished to the tune

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of USD 100 bn per annum and handed over government-to-government. In fact, the Green Climate Fund will be just one of a range of mechanisms making up a Green Climate Finance Framework, which together can deliver the required volume of funds.

The bulk of the capital required will be to finance assets – either for large-scale projects or distributed solutions. This means the biggest challenge will be to come up with around USD 70 bn of debt per annum (assuming average leverage levels). That is not to say that finding USD 30bn of equity will be easy, but the equity markets are far more developed in most recipient countries than the debt markets. If there are good projects – and investment in capacity-building would be required to ensure there are enough – equity sponsors will emerge among local economic and political elites as well as among specialist global investors. Similarly, investment in technology development, especially if you count the building of factories under asset finance, is likely to account for less than 10 per cent of the funds and will not be the main bottleneck.

We are not just looking for any old USD 70 bn of debt: it must be USD 70 bn of cheap debt. As described above, the cost of finance is of critical importance in determining the cost of clean energy. By starting with the creation of a pool of cheap debt, you have visibility of the true extent to which the resulting solutions will require some form of supplementary support. The Get FiT approach, which starts by providing overseas support for feed-in-tariffs in developing countries, would indeed drive down the cost of capital, but, like elsewhere, it will deliver excessive rent to developers and investors and lead to boom-bust cycles in the supply chain.

The first place to look for cheap debt is to increase the volume of concessionary finance provided by the development banks. These already invested around USD 13.5 bn in utility-scale renewable energy projects in 2010 and billions more on energy efficiency and grid infrastructure. They could increase this figure significantly by shifting lending out of fossil-based projects. Frankly, it is unclear why the developed world should continue to fund the deployment of polluting technologies in the developing world.

The remaining USD 50 bn of debt would need to come from the private sector. The key question is under what terms western pension savers and tax-payers can be expected to allow their money to be invested in infrastructure development in the world's poorest countries. The answer, of course, is when it is not going to disappear down the plug hole. This means it needs to be covered by some form of sovereign guarantee backed by developed world countries – perhaps in the form of a credit default swap or first loss provision – such that it qualifies for an investment grade rating. The rating is critical if institutional investors are going to be able to hold the resulting paper.

Risk management in a Green Climate Finance Framework

Why should western taxpayers underwrite this facility when the biggest risk is policy change or some form of nationalisation by recipient countries? What is needed is to make the acceptance of this very cheap debt conditional on the signature of an investment treaty preventing the most common ways in which the assets could otherwise be confiscated. When multilateral banks invest in major projects, they effectively do this on a case-by-case basis; here the projects are too small and the private investors lack resources and skills, so it must be done at the sovereign level. At the same time, recipient countries could be asked to commit to a green growth path by agreeing to phase out fossil fuel subsidies and refraining from investing in dirty energy in competition with the projects being built under the Green Climate Finance Framework.

Of course the signature of an investment treaty does not preclude a natural disaster, coup or national default from rendering the debt worthless. Those risks would be covered by the sovereign guarantee, along with some level of foreign exchange risk – but, at most, that part of the total which relates to hard currency costs. It might be possible to use the World Bank's Multilateral Investment Guarantee Agency (MIGA) here, but it would need to scale up very considerably from its currently-modest volume of business. It should also be possible to bring in commercial insurers to take on specific risks – such as construction, or maintenance performance, where their superior knowledge makes them effectively lower-cost providers than governments.

Role of the Green Climate Fund

Once debt costs are brought into line with those in Germany, the UK, Japan or the US, clean solutions would, as we have seen, cost only marginally more than dirty alternatives. Whatever differential remains, however, must be funded. The main role for the Green Climate Fund should be as the keeper of grant funding to cover this residual cost differential. The grants could be delivered in any number of possible ways, including perhaps guaranteed tariff payments or premiums for the life of the project.

Project developers should have to bid competitively to secure tranches of Green Climate Fund grants, with awards going to those developers that can produce the maximum level of climate benefits with the minimum amount of money from the fund. This will ensure the most efficient leverage of public funds provided by the developed world. Ensuring that each dollar of support goes as far as possible will be essential to retain political support for the process. The bidding process could be designed to reflect the situation of different regions or countries. In the case of more rapidly developing countries such as China or Brazil, the availability of grants from the Green Climate Fund should be limited. For very poor countries it could be met entirely by developed world sponsors.

Completing the Green Climate Finance Ecosystem

While the sovereign guarantees could be administered by the same team as manages the Green Climate Fund, or by multilateral banks on their behalf, there are better options. Existing providers of export trade finance have considerable skill in this area, as do private insurance companies and banks. Just as elsewhere, the cost of intervention will be lower if the developers of clean energy projects are allowed to shop the best projects around to a range of different providers, rather than having access only to one source. There is no reason why developed countries, or groups of them, should not contribute to a range of Green Climate Guarantee Facilities, managed by different public and private institutions.

There is a role for carbon credits in such a structure. As discussed, although there will be no global carbon

markets, they will still exist at municipal, state, national or regional level. Each of these schemes could be partnered with a Green Climate Guarantee Facility, so that regions supporting projects in the developing world through the carbon markets would reduce the investment required in the Green Climate Finance Framework.

It will be up to the project developer to create a bundle of energy sales agreements, debt, Green Climate Guarantees, carbon credits, insurance, and any other inducements on offer from different players; and to have this certified as viable by a verification provider before bidding for the lowest possible grant funding from the Green Climate Fund which enables the project to proceed.

Part of the beauty of this approach is that it minimises requirements around measuring, reporting and verification. All that is needed is a list of clean technologies or project types which qualify, and then the same sort of due diligence as on any other type of infrastructure investment. As long as each qualifying investment is announced publicly, the flow of Green Climate Finance Framework funds can be added up and scrutinised by whoever feels the need.

Clearly there are many questions that need to be answered in the detailed design of a Green Climate Finance Framework. The point is that it can be done: the promise of USD 100 bn of climate finance for the developing world can be met, with sufficient creativity and flexibility all round.

This brings me to my final point. A rapid shift to a green economy will bring the world enormous net economic, social and environmental gains, but it will not benefit everyone. There will be losers as well as winners; many of the losers will be rich and well connected. Fossil fuels have been a good and generous master.

As a result, nothing will happen without leaders who rise to the challenge. There is no route to a green economy that does not require vision, clarity of purpose, bravery, a bias for action and exceptional negotiating skills. Do we have those leaders?

Time is short. There is much work to be done. ◀



Michael Liebreich (Twitter @MLiebreich)

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Sustainable strategies, technologies, processes and products

Tulsi R. Tanti

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The author reiterates the call for a new approach based on the twin challenges of growing energy needs and the already visible evidence of climate change. He makes a clear distinction in roles between government, the enabler, and business, the innovator. He highlights renewable energy as an engine for change, notably stressing the benefits of the production of green energy to meet the demands of growing economies without adding to the climate change risks. As a producer of wind turbines, he emphasizes the numerous advantages of a technology which, he says, creates jobs, does not impede agriculture and costs less than other renewable energy.

Evolution is inevitable. We are all, albeit in different proportions, growing all the time; this year alone – 2011 – the global economy is expected to grow at 4.5 per cent while, within pace with growth, primary energy use is set to grow 40 per cent through 2030.

In economics, various metrics are used to measure development. Based on these metrics the world is broadly separated into three categories; least-developed, developing and developed economies. At any stage of development or rate of growth, one thing is constant – rising demand for energy. Growth is, after all, fueled by energy. The developing world needs energy to power its growth, as does the developed world.

In this dynamic growth mix, change in just one variable can change our energy needs drastically; for example, population. Declining death rates and increasing birth rates have resulted in an explosion of population. This is a definite sign of much desired progress, but the consequence is once again unparalleled need for energy, weighing down the existing energy infrastructure.

Further, economic advancement has rarely been just and equitable; for decades it has favoured the rich. New wealth is usually created in the urban areas while the poor continue to suffer. And this divide is more often seen in developing countries. For example, over the past two decades, annual real rural income in India has seen a growth of just 2.8 per cent. In the next two decades, this growth is predicted to change by a mere one per cent. Simply put, almost 70 per cent of the Indian population stands to barely benefit from India's rapid economic growth of seven to eight per cent per year.

Growth and energy use is undeniably interlinked. As growth accelerated in the industrial era, so did our use of fossil fuel energy. The most popular image of the latter part of the 18th century is possibly the endless factories chugging huge amounts of coal and spitting out black clouds. These energy sources, apart from producing large amounts of usable power, also produce large amounts of undesired greenhouse gases.

Global atmospheric concentrations of CO₂, the most important greenhouse gas, ranged between 200 and 300 parts per million (ppm) for 800,000 years, but have shot up to about 387 ppm over the past 150 years, mainly because of the burning of fossil fuels.

The average temperature on earth has already warmed by close to 1°C since the beginning of the industrial era. The consequences of this are already being felt across the world: extreme weather fluctuations, widespread melting of glaciers, and rising sea levels.

Globally, precipitation has increased even as Australia, Central Asia, the Mediterranean basin, the Sahel, the western United States, and many other regions see more frequent and more intense droughts. Heavy rainfall and floods have become more common, and the intensity of storms and tropical cyclones has increased.

Though climate change is the biggest threat facing humankind – the fallout of continuing to be dependent on fossil fuels is not limited to it. Fossil fuels may not even last to witness the full blown devastation caused by climate change – though they will have rendered enough damage.



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A wind turbine is made up of approximately 8,000 components – a clear indication of the sheer immensity of the employment market wind can create

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We are in the midst of a revolution once again. A new world order is in the cards, as the world's centre of gravity moves from North to South.

Home to one third of the planet's population, China and India are taking the sustained lead, unlike any success stories of the past. Within less than three decades India is predicted to firmly settle as the third biggest economy of the world.

The climate change threat has been looming over us for decades now, and its interconnections to other factors make it a devastating prospect. The report by WEF World Economic Forum⁷ shows the linkages between climate change and economic disparity, extreme weather events, extreme energy price volatility, geopolitical conflict, flooding and water security. In other words humanity is in deep trouble.

But this is not new: we are not only aware of the dangers of climate change – we have also faced them and will continue to do so. The Food and Agriculture Organization (FAO) says world food prices this January hit a "historic peak". The food price index, collated by FAO, averaged 231 points in January, which is the highest since 1990, when it started measuring food prices globally. The reasons for the spike are not just the traditional, but newer challenges of extreme weather events, floods and droughts, heat and frost waves.

In 2010 itself, two separate grain-growing regions of the world were being impacted by extreme weather – extreme cold and frost in Canada and searing heat and drought in Russia. There were floods in Australia and a winter drought in China's main wheat-growing regions. All this has meant global wheat production is down and prices are high. Bad weather has taken its toll on crops across the world.

There are many more cases of damage to crops because of changing weather. And these losses are not contained. Bad weather, increased food prices have added to poverty and the spilling global unrest. This will only get worse, if we do not ramp up efforts on each and every facet of climate change mitigation.

The question now is whether we will repeat the patterns of the past in this new developmental era or apply better methods for a better world? We now have the opportunity to rebuild an economy which is just and equitable. In addition, collectively we also have the choice to power this change on clean, green and sustainable energy.

The question is how and who? Is it the onus of the government or responsibility of the private sector?

The role of the government is to put into place policies and systems which encourage maximum investments by the private sector; but it is up to the industries and individual businesses to bring about the change and spur the country into action. The function of the government cannot be discounted – after all they provide the much needed structure and support – but the task of driving research and innovation clearly needs to be with the private sector.

We need more companies to take advantage of the opportunity provided by the Government and translate buzzwords, such as "sustainability" and "climate protection" into products and solutions. We need each individual business to employ innovative methods in the development of these products. Sustainable strategies, technologies, processes and products open up completely new potential for growth; and this growth can only be powered by collective effort. Companies must take energy efficient measures rapidly. We need the industry to rise to the occasion and drive change.

One path that leads to the desired change is the one I have dedicated my life to – renewable energy. The obvious benefit is the production of green energy, which will meet the demands of the growing economies without adding to the climate change risks. But if you dig a little deeper, the not so visible outcomes add up significantly.

A wind turbine is made up of approximately 8,000 components – a clear indication of the sheer immensity of the employment this business can create. In addition to manufacturing, various other sectors are involved in wind energy development, ranging from environmental consultancy, electrical and civil engineering to financial and legal services.

Even during the recent economic breakdown, the wind energy industry continued to contribute to the job market. At the end of 2009 more than 600,000 were employed in the wind energy sector globally. That is equivalent to almost 15 jobs per megawatt (MW) installed.

Additionally, wind energy can be generated locally and distributed directly to the local distribution network: this is known as embedded generation. The distance over which electricity has to travel is reduced, meaning less electrical losses in transmission and distribution, and therefore saving energy.

The benefits from local electricity generation are particularly valuable in areas remote from centralized systems and where the transmission or distribution grid is weak. Local energy generation will also be of great importance as the world's fossil fuel sources start to run out.

Importantly, wind energy is not a hindrance to agricultural activities; a critical factor for most emerging economies. Land under development for wind farms can remain in agricultural usage. In fact, easement payments to land owners can provide a significant second income without disrupting existing land use (farming, ranching, etc.). The tax revenue generated by wind energy contributes to the development of community in the form of better schools and health amenities.

In India, our major cities are crowded and infrastructure is pushed to the limit. But thousands flock to the cities everyday in search of work. This, in turn, increases pressure on our cities, threatens our rural way of life and breaks up family units. But wind farms typically come up in the remotest parts of the country. So, at Suzlon, we started training people in rural communities in wind energy. This means today they have secure jobs, do not add to the migration and our customers get great, localized service.

Solutions like the above are plenty. The private sector is the development catalyst of any economy, and seeking such opportunities has never been more important than today.

I believe fervently that today's business leaders must shape a greener world to halt climate change. So whenever possible, we strive to employ life-changing solutions that make a difference to our planet and also deliver a return on investment.

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Amongst the renewables,
wind is approximately
four times cheaper
than solar
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Every business needs to consciously make a difference. Today, with the threat of climate change, an inclusive approach is even more urgent.

Suzlon is both a business and the champion of that cause. It is both providing the world with sustainable green energy solutions and we are employing them in our own backyard. Suzlon One Earth, our 10.13-acre global headquarters in Pune, is a campus powered 100 per cent by renewable energy. There is a myth that energy-efficiency is expensive. Our experience is that the opposite is true. Meeting LEED Platinum standards and running wholly on green power, 'One Earth' cost about 10 per cent less to build than a conventional building!

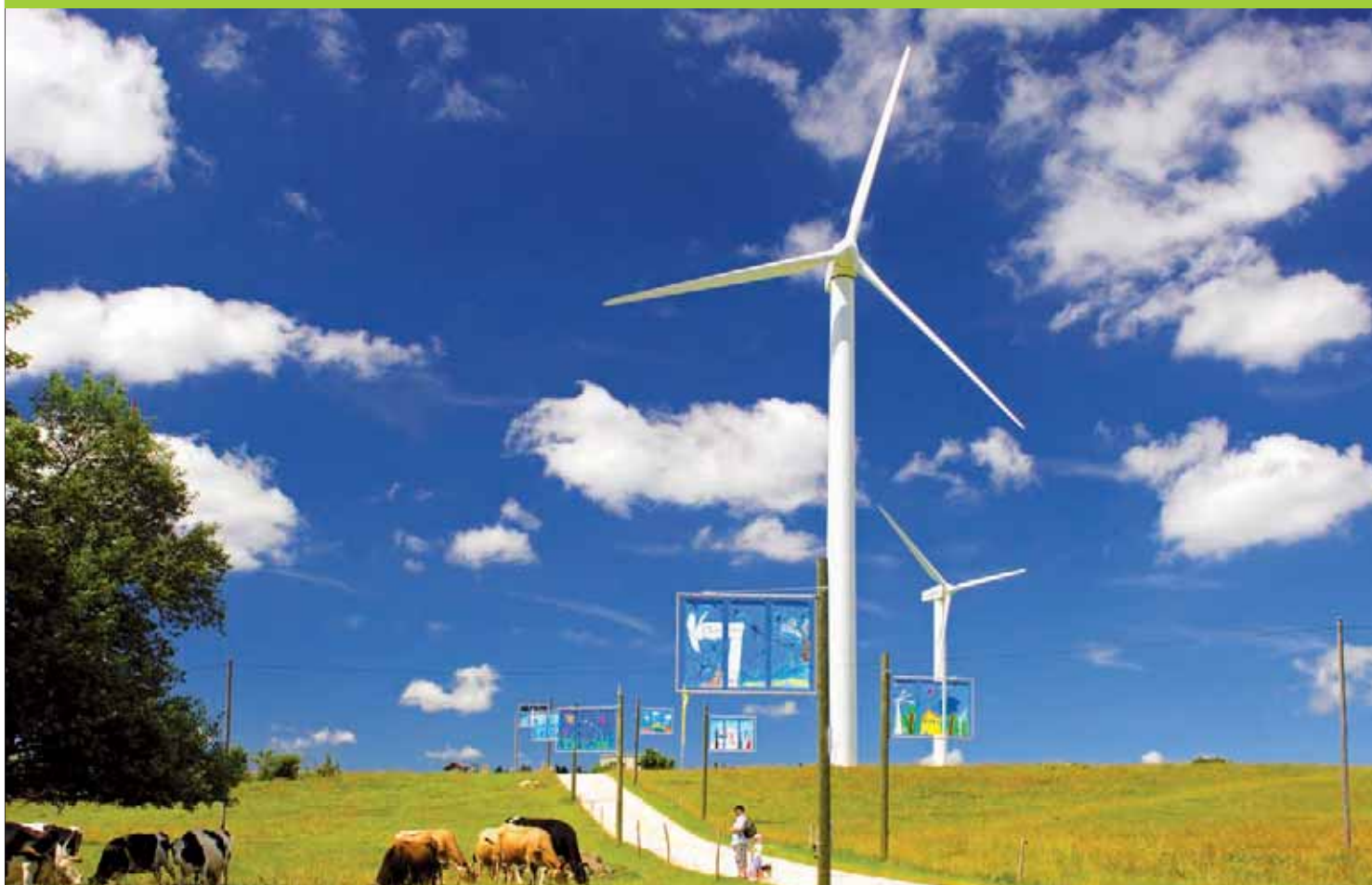
One Earth was named as a tribute to Earth's unique existence as a self-replenishing ecosystem. We hope it will serve as inspiration and proof to others that it is possible, if we are really determined, to create the sustainable world we seek for our children and grandchildren.

The private-sector needs to employ both green solutions and also maintain sustained investment into R&D. I cannot stress enough the role of R&D in any technology driven process. It is decades of work, by some very brilliant minds, to make technology amenable for people like you and me. Their work has possibly never been more important – the challenge for them, in this age, is to bring about change in an environment which itself is rapidly changing.

At Suzlon, we have set up research, development and innovation centres in Denmark, Germany, the Netherlands and India – and soon in China. These centres focus both on product development and fundamental, game-changing technology. Today, Suzlon is the only global wind power company that comes from an emerging market – arguably because we provide technology at par with any developed country.

The wind industry today is notably different from that in the early eighties. Wind turbines now are typically 100 times more powerful than earlier versions and employ sophisticated materials, electronics, and aerodynamics. Costs have declined, making wind more competitive than other power generation options. Even amongst the





renewables, wind is approximately four times cheaper than solar.

But the winds of change have just arrived; 37 gigawatt (GW) of wind energy was installed the world-over in 2009, and 16 GW in the first half of 2010. This growing demand can only be met through improved production processes, cleaner goods and services and cutting-edge technological advances. At Suzlon, we are focused on continual development of turbine technology that is not only cost efficient but also more energy efficient per kilowatt hour – working towards making wind increasingly competitive against conventional fossil fuels. Additionally, we are experimenting with options of predictive performance (condition monitoring / forecasting) and energy storage.

At the state level, we encourage economies to look at developing a more holistic grid interface which is geared to absorb and distribute the growing wind energy

production. Developing smart grids will allow the opportunity to track flow of energy and control system components for economic optimization. The need for building transmission infrastructure which is 'green' friendly is prevalent across development divides. There are 1.5 billion people who live in the dark, without regular access to electricity. Electricity is a basic human right: we need innovative solutions to assure affordable power to all.

In the end, it is really only about an attitude change. It has been proved over and over again that employing green methods is not only necessary but also profitable. We are obliged to employ all resources offered to us by nature; it is the only way to maintain its balance.

As an entrepreneur, I am an eternal optimist. I am certain that my peers will rise to the challenge and work out solutions which are profitable and build a greener future for all six billion of us, and for the generations to come ◀



Tulsi R. Tanti

Tulsi R. Tanti is the Founder, Chairman and Managing Director of the Suzlon Group. Starting a textile business in the 1990s, Mr. Tanti endeavored into a lesser known solution, commissioning two wind turbines to supply electricity to his textile unit. While realizing the potential of competitive green energy, his textile business changed - in a span of 15 years - quickly specializing in the production of renewable energy. Today, Suzlon energy is a world-leading wind energy company which employs over 13,000 people and has combined revenues of USD 5 billion in 32 countries and six continents.



Greening the economy through fairtrade: a model that works

Michael Kwame Nkonu and Martin Rohner

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Few social enterprises providing innovative market-based solutions to social and developmental challenges have managed to impress upon industry a different way of thinking about sourcing practices and supply chains more than Fairtrade. Fairtrade is not just another standards and certification tool: it is an alternative approach to trade based on partnership and equity. At the heart of Fairtrade lies the development and empowerment of small farmers and plantation workers in the 'South', who for decades have been disadvantaged in the conventional trading system. Despite numerous challenges, the Fairtrade system illustrates how the global trade system can incorporate sustainable development and empowerment of producers.

To understand the essence of Fairtrade, it is helpful to take a look at its short but dynamic history. Its roots go back to the solidarity movement of the 1980s, which sought to raise awareness about the appalling working and living conditions on plantations in the 'South' and the challenges faced by smallholder farmer organizations exporting agricultural commodities to Western markets. For many of these workers and producers, as well as for consumers in the 'North', the emergence of World shops, offered an outlet for a "fairer offer", challenging mainstream markets with respect to their social and environmental sustainability.¹

Inspired by the success of organic certification and labelling, a first Fairtrade labelling initiative by the name of Max Havelaar was founded by Dutch civil society in 1988. The idea spread quickly across continental Europe and eventually to the rest of the world, as local non-governmental organizations and alternative traders followed the Dutch example. The Fairtrade concept, consisting of a guaranteed minimum price, the self-organization of farmers and workers, and a collective premium for socio-economic investments, enabled thousands of coffee farmers in Latin America to continue farming their lands instead of migrating to the cities and leaving their land uncultivated during the coffee crisis of the early 1990s.

Today, over 800 cooperatives and plantations, with around 1.2 million smallholder farmers or workers, are certified against the international standards of Fairtrade. Three producer networks in the Latin America and the Caribbean, Africa and Asia-Pacific regions ensure that producers assume ownership through active participation in the system. National labelling initiatives anchored in civil society promote the Fairtrade label in the market and support market access for certified producers. By the end of 2009, the global retail sales value of Fairtrade labelled products reached EUR 3.4 billion, with the main markets flourishing in Europe.²

Despite the market forces that have shaped its evolution, Fairtrade continues to uphold certain core principles that set it apart from conventional product certification schemes: participation and co-ownership by producers; inclusive multi-stakeholder processes; standards that effectively reflect the producer situation in the South and market realities in the North; a Fairtrade Minimum Price and a Fairtrade Premium that, in principle, should ensure that compliance costs are covered and not simply passed on to producers; long-term trade relationships; pre-financing; and – last but not least – a strong label that assures consumers that their choices make a difference to the lives of farmers in the South.

The evolution of Producer Networks within the Fairtrade system is both unique and unprecedented. Through them, producers are able to participate in standards setting, governance and overall management of the Fairtrade system. These networks also offer the opportunity for producers to engage in market promotion activities, advocacy work and public debates. In 2010, for instance, a group of Fairtrade producers participated at the UNFCCC Conference of the Parties in Cancun to showcase their experience in combating climate change and to highlight their contribution to sustainable agriculture and the mitigation of climate change.

Producer Networks have also been instrumental in facilitating Fairtrade farmers' exchange of experience and in promoting local markets. For instance, in South Africa, the introduction of Fairtrade products like coffee means trade relationships are being formed between producers in East Africa, where Fairtrade coffee is produced, and a roaster in Johannesburg which carries the Fairtrade label. Similarly, cocoa producers in West Africa are now able to access the South African market due to the growing Fairtrade market in that country.



Pineapple Worker in Ghana
Emilie Persson, Fairtrade Africa



Coffee Picker in Peru
Max Havelaar Foundation (Switzerland)

Common misconceptions

Economists often argue that the guaranteed minimum price advocated by Fairtrade prevents structural change and diversification. In reality, the minimum price and the Fairtrade premium create the “economic breathing space” to allow marginalized producers to take a longer term view of their economic development and invest in their future. The social organization of farmers or workers and the Fairtrade Premium provide the momentum to drive collective change. There are many empirical examples of diversification among Fairtrade cooperatives that prove this point. The Fairtrade organic premium, for example, helps cotton farmers in Mali reduce the economic risks associated with the switch from conventional to organic cotton production.³

Equally, it has been argued that Fairtrade creates “islands of wealth” among the communities in disadvantaged regions. However, independent impact assessments have shown that Fairtrade benefits the wider community. In the Yungas region in Bolivia, for example, Fairtrade has led to higher prices, not just for the Fairtrade certified producer organizations, but for the region overall.⁴

There is also a perception that governments in the South see Fairtrade as another form of Northern driven social and environmental protectionism. In reality some governments, such as Malawi, recognize Fairtrade as a powerful partner in agricultural development because of the better terms of trade Fairtrade offers to their farmers.⁵ Fairtrade is starting to catch on as a complimentary approach to regional development goals, such as in the Comprehensive African Agriculture Development Programme (CAADP) of the New Partnership for Africa's Development (NEPAD).⁶

Often regarded as primarily a social standards system, Fairtrade standards also comprise stringent environmental criteria, which, however, take into account producer realities in the South. Fairtrade's environmental strategy is developed from a producer perspective, recognizing that the social and economic well-being of producers is a prerequisite for sound environmental management and the resilience of farmers to climate change.⁷⁻⁹

The real challenges

While clearly a success story and a good example of how civil society has managed to lead in the quest for a green economy, Fairtrade Labelling has not remained without challenges.

First, Fairtrade is a market-based system. While compliance costs are substantial, given the stringency of the standards, producers benefit from Fairtrade only in as far as they are able to sell on Fairtrade terms.¹⁰ This is why it is important to continue growing the market and market access for Fairtrade certified producers.

Second, Fairtrade was conceived as a “learning-by-doing” approach, whereby farmers are themselves in charge of their development. Fairtrade simply sets a framework that ensures that the terms of trade are fair and communities are provided with the means to develop themselves. While this provides for a sustainable, community-lead development process, it can be challenging in a high growth environment, where market demand outstrips supply. Thus, there is a tension between industry's need for “speed to market” and the time horizon required for socio-economic transformation.

Third, even Fairtrade is not void of tensions between Northern consumer expectations and the realities of smallholder farmers in developing countries. The commitment to inclusive and participatory multi-stakeholder processes has been an important factor in the success and sustainability of Fairtrade Labelling; however, this requires continuous adaptation of the governance structures to ensure the system remains manageable, effective and representative.

Fourth, the success of Fairtrade has contributed to the proliferation of ‘ethical’ brands and private sustainability initiatives. This is a welcome opportunity to grow the market for sustainable products more quickly, but there are risks of unfair competition amongst different certification schemes with differences in ambition, standards, independence and financing strategies. Interestingly, Fairtrade remains the only movement that has adopted a guaranteed minimum price, a social premium and the requirement for producers to organize themselves; elements that directly tackle the issue of trade justice and empowerment.

Fifth, Fairtrade relies heavily on an export-model approach: even though it increasingly works to develop local markets in the South, the sheer size of the Northern consumer markets and the headstart of the Northern-based labelling initiatives means that efforts to enable market access at fair conditions are still slanted towards markets in the North.

Finally, and most importantly, the fundamentals of the commodity trade have changed dramatically in the past decade. Declining soil quality, water shortage and climate change have taken their toll on productivity and yields, whereas demand

for food is rapidly rising due to population growth and changing eating habits. Speculative investments and a historic decline of the major trade currencies are further drivers of high and volatile commodity prices.

In this context, smallholder cooperatives are particularly challenged by market volatility and the need for professional risk management and pre-financing. All these factors can undermine the cooperative integrity of producer organizations and diminish their relevance. While the Fairtrade Minimum Price is lower than current market prices for most commodities, Fairtrade remains a guarantor of fair trading relationships and ensures that higher prices actually reach producers.

Conclusion

The Fairtrade system illustrates how the global trade system can incorporate sustainable development and empowerment of producers. It offers a practical solution to internalize the costs of moving to a greener economy. By focusing on producers, Fairtrade ensures that “commercial reciprocity” is not only defined by economic returns. Instead, it also puts a value tag on the ‘external’ benefits that trade can generate.

If the world is to fully live up to the concept of a green economy as a global common good¹¹, support must be provided to those producers that are least responsible for the negative impacts of globalization and environmental degradation.

Fairtrade has achieved a lot in this respect thanks to a close collaboration with industry, governments and donors, and the growing support of consumers. But the journey continues and will require all stakeholders to remain committed.

While industry is recognizing the opportunities and benefits of 3rd party certification, it should also acknowledge that sustainable supply chains require social transformation and support to producing communities that cannot be achieved overnight. Certification is a means to an end, not the end in itself, since certification and control alone do not create the fundamental change that is required for a greening of the economy. This means that industry will need to commit to a longer-term engagement and also accept that set-backs can occur. Also, fair trading conditions and sustainable production come at a price - a price, however, that consumers are increasingly willing to pay!

Consumers have to be further educated about the impact their purchasing decisions have upon farmers and workers in the South or on the environment. While Fairtrade has been astoundingly successful in raising consumer awareness in the European consumer markets, it is virtually unknown in other regions. Governments should support civil society initiatives that are committed to this advocacy and awareness raising role.

Donors should continue financial support to sustainability initiatives like Fairtrade.

But the level of support should be tied to their level of ambition of such initiatives. Moreover, initiatives need to prove that they have a funding mechanism built into their business model that ensures that they will eventually become independent from public and private donors and able to finance themselves through the market. Donors should avoid subsidizing Corporate Social Responsibility programmes of large multinational corporations and instead focus on independent, civil society-backed initiatives with strong ownership and participation by producers.

Governments of producer countries are invited to take a closer look at Fairtrade and the benefits it can bring to their agricultural sector. Partnerships with national marketing boards or trade ministries could allow initiatives like Fairtrade to become more strategic in their interventions and leverage change across entire sectors.

Finally, Fairtrade and other sustainability initiatives have to continue to look at themselves critically and adjust in the light of changing market parameters and producer needs. Competition between ethical trade initiatives that leads to a “race to the bottom” needs to be avoided. Instead, creative and realistic forms of collaboration need to be sought that can push the envelope of the green economy even further ◀

Box 1: Fairtrade's Vision and Mission ¹²

Vision

Fairtrade's vision is a world in which all producers can enjoy secure and sustainable livelihoods, fulfil their potential and decide on their future.

Mission

Fairtrade's mission is to connect disadvantaged producers with consumers, promote fairer trading conditions and empower producers to combat poverty, strengthen their position and take more control over their lives.

Box 2: Standards Overview ¹³

FLO standards		
Trade	Social	Environment
<ul style="list-style-type: none"> • Guaranteed minimum price • Fairtrade premium • Long-term trading relationship • Advance financing • Transparency 	<ul style="list-style-type: none"> • Working conditions (ILO) • Self Organisation • Community development • No discrimination • Democratic processes 	<ul style="list-style-type: none"> • Environment friendly farming (equates to IP) • Interdiction of dangerous pesticides • Promotions of organic farming (extra premium) • Preserve valuable ecosystems • Water and waste management

End notes

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- 12 http://www.fairtrade.net/our_vision.o.html
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For more information about Fairtrade, visit www.fairtrade.net



About the authors

As Executive Director, Michael Nkonu works with the Fairtrade Africa Board to develop and manage the strategic direction of Fairtrade Africa. He oversees the work of the Fairtrade Africa team to ensure the vision is effectively communicated and implemented to various stakeholders both within Africa and internationally to advance the cause of Fairtrade African producers. Until recently, he worked for the Fairtrade Foundation as Africa Manager spearheading the expansion of Fairtrade activities in Africa. His work with small farmer organisations, businesses, governments and international organisations has leveraged organisational, technical and financial support for African producers. Michael, who is a Ghanaian national, has a Master of Science in Agriculture, Food Security and Natural Resources Management from the University of Hohenheim, Germany.



Martin Rohner is CEO of the Max Havelaar Foundation (Switzerland) since 1 October 2005. In May 2007 he was elected to the Board of the Fairtrade Labelling Organizations International (FLO) in Bonn, in which the Max Havelaar Foundation is a member. The Max Havelaar Foundation is one of the leading Fairtrade Labelling Initiatives. From 2001 to 2005 he managed the Multilateral Financial Institutions Division of the State Secretariat for Economic Affairs (SECO). From 1998 to 2001 he was Advisor to the Executive Directors for Switzerland in the World Bank and the Inter-American Development Bank in Washington. From 1994 to 1998 he worked at the Federal Office of Foreign Economic Affairs. Prior to joining the Swiss Government, he worked in the private sector in the field of marketing and as project manager for one of the leading Swiss airlines. He has also worked as a business analyst at a major Swiss bank. Martin Rohner holds a licentiate from the University of St. Gallen, Switzerland (lic. oec. HSG), and a Masters Degree in Environment and Development from the University of Cambridge, UK (M. Phil).



Greening the global economy through open markets and skills transfer

Peter Brun

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Peter C. Brun argues strongly that, for the transition to a green economy to be successful, it is crucially important to ensure open markets and skills transfer for renewable industries. Trade liberalization, he points out, will benefit recipient countries not only because it will drive down the cost of energy but also because free markets and a stable pipeline of projects will lure investors to countries that implement green policies. Noting that the wind industry benefitted, in its infant years, from a high degree of openness but has now come under increasing pressure from Governments to implement local content requirements and other barriers to trade, he highlights opportunities to be derived from a Sustainable Energy Free Trade Agreement (SEFTA).

Green growth is a matter of making our societies more sustainable while still compatible with a modern way of living – and thus very much about using our existing resources differently and more sustainably. The imperative to act becomes all the greater when considering the implications of continued population growth. Indeed, the United Nations estimates that the global population is likely to exceed nine billion people by 2050, up from today's 6.8 billion. According to the World Resources Institute, such growth risks severely depleting natural resources such as fossil fuels, timber, minerals, and water. Simply feeding the world's expanding population will increase water demand 70 to 90 per cent by 2050 absent improved agricultural methods.

Managing resources for greater and truly sustainable productivity is rapidly becoming one of this century's greatest imperatives. Accelerating resource productivity investments now will stimulate national economies through job creation in the short-run, and will lay essential long-term infrastructural foundations (physical, policy, societal) for sustainable economic development in an era where societies will increasingly be "running out" of everything.

Technological innovations will contribute substantially to achieving the shared goal of sustainable resource management. At

Vestas, we are also confident the rapid productivity and technological advances will bring the wind power - at least - on par with oil and gas. This is our *raison d'être* and, as a leading green energy company, Vestas is often invited to present a private sector view on green growth strategies at summits across the World. One such event was the G20 Summit that took place November last year in Seoul, where our CEO, Ditlev Engel chaired the Business Summit working group on "Creating Green Jobs", which presented a range of strategic recommendations to the participating Heads of State on how to achieve a sustainable growth trajectory in four important sectors – power, buildings, industry and transportation.

The report concluded that countries that have been fastest to embrace the green economy have already created huge numbers of green jobs and new economic growth engines that are not dependent on fossil fuels or scarce natural resources. Let me mention a few examples:

- Germany has created 340,000 jobs in its renewable energy sector.
- China, by some estimates, has created more than one million renewable jobs.
- More than 30,000 jobs have been created in Spain's wind sector alone.

The report provided four equally important general recommendations:

- Give us a price on carbon – and make it high and stable enough to change people's behaviour and investment decisions.
- Allow free trade in green goods and services.
- Eliminate fossil fuel subsidies – as fast as possible, but within five years.
- Ratchet up R&D support for green goods and services.

All of these recommendations are supported by detailed findings mapping the growth potential in the above-mentioned sectors. Unfortunately, such recommendations are not endorsed and implemented overnight, so green industry pioneers like Vestas have to continue the fight!

Open markets and skills transfer

Vestas Wind Systems has been solely dedicated to wind energy for more than 30 years, and we have thus played a central part in the development of an industry that already today plays a very important role in the energy mix of many countries (Denmark holds the world record with 20% of electricity generated from wind turbines; Kenya might reach an even higher per centage when the planned Lake Turkana project is implemented).

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We urge decision-makers to consider the long-term benefits of their policy alternatives rather than opting for short-term gains through local content requirements and tariff barriers

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When wind energy was still in its infancy, markets were characterized by a high degree of openness. Vestas and our competitors (initially mostly based in Denmark) were able to export our technologies to a number of markets across the world without significant tariff or non-tariff barriers. The open markets contributed to kick-starting the industry, which has now leapfrogged to a much larger scale.

Having gradually matured from a niche industry with very few stakeholders into a highly competitive high-growth sector, the industry today encompasses a large number of global green-tech companies that compete to increase quality and to drive down the cost of electricity from wind projects on land and sea. Developments have been spurred not least by access to global markets, with the overall goal of reliably delivering the largest possible quantity of CO₂-free electricity at the lowest possible cost.

However, in recent years - at least partially as a result of the global financial crisis - more and more countries have raised tariffs for renewable energy components and implemented non-tariff barriers such as local content requirements that give special preference to local suppliers. This development risks slowing down technology innovation, decreasing quality and increasing the cost of energy of wind projects - precisely the opposite of what regulators, political leaders, and our customers increasingly demand. The growing scope of barriers to trade undermines the wind industry's ability to build effective and flexible supply chains and drastically reduces the level of skills transfer across borders. The only way the wind industry can deliver on its promise to supply very large quantities of cost efficient, CO₂-free power is to provide for stable policy frameworks, economies-of-scale and open markets.

Local content requirements in the wind industry - which is presently characterized by over-capacity due to significant investments in recent years - increase the total costs of projects, stifle innovation and could - in some cases - lead to contract awards to companies that have a local manufacturing base but have little or no previous experience dealing with the complexities of wind.

We find in our many conversations with official stakeholders that there is often too much unwarranted attention on the short-term gains of forcing wind turbine manufacturers to invest in local manufacturing of towers, blades or nacelles compared to the many other local benefits of green jobs the project generates, notably stable operation & maintenance jobs and jobs in construction and infrastructure. Experience in countries like Denmark, Germany, Spain and China has demonstrated that wind industry manufacturers and sub-suppliers that have been exposed to competition in their domestic markets have much better prospects of developing into global brands than companies that are established behind trade walls with little or no outside competition.

Vestas welcomes free and fair competition and will be pleased to participate in the creation of more wind industry clusters around the globe. Vestas aims to be "in the region for the region," and we will work with government stakeholders and customers in developing and developed countries alike to create the right framework conditions for a sustainable development of the local wind industry. In new markets, we typically offer wind training programmes; develop local suppliers; source local engineers; and localise components wherever the local supply base can deliver at the right quality and price.

Experience from new wind markets overwhelmingly suggests that open markets and a stable pipeline of wind projects are the best ways to create a viable wind industry. We therefore urge decision-makers to consider the long-term benefits of their policy alternatives rather than opting for short-term gains through local content requirements and tariff barriers. Evidence shows that open markets create a win-win situation for both developed and developing countries.

A multilateral green energy trade agreement needed

The last thing green energy industries need at this difficult moment is a gradual renationalization of energy markets. We therefore believe that the multilateral trade system must now take steps to defend level playing field conditions in all renewable energy subsectors.

A successful conclusion of the Doha Round should, of course, have first priority. However, if an agreement cannot be reached in 2011 (and prospects look bleak at the moment) negotiators should accelerate ongoing efforts (in the WTO and other multilateral bodies) to conclude bilateral Free Trade Agreements like the one recently signed between the European Union (EU) and the Republic of Korea.

The third and most rewarding option would be to bring together a coalition of the willing to agree on a sectoral agreement on sustainable energy trade liberalization that would serve three important purposes:

- a)** boost green growth and job creation in developed and developing economies alike;
- b)** boost the fight against climate change by opening market access for renewable energy technologies; and,

The last thing green energy industries need at this difficult moment is a gradual renationalization of energy markets

c) break the deadlock in international trade diplomacy.

Vestas has been working with other green energy companies to support and promote proposals to create new momentum in international trade relations. In 2009, Vestas together with other corporate members of the World Economic Forum, proposed the creation of a Sustainable Energy Free Trade Agreement (SEFTA).

The idea behind SEFTA is to build the broadest possible coalition of countries (initially with G20 countries at its core) that would commit to sweeping trade liberalizations for renewable energy goods and services and to phasing out fossil fuel subsidies to allow for level playing field

conditions between traditional and renewable energy sectors (see fact box on page 62).

Vestas faces competition from other energy sources head on and we are certain that – as our industry continues its technological advances – global wind turbine manufacturers can present very attractive business cases to our customers and investors, not least in developing countries where energy is scarce and fossil-based alternatives are expensive and polluting. Given the right regulatory framework, the wind industry can create thousands of jobs, reduce CO₂ emissions, facilitate skills transfer and bring clean electricity to both rural and urban areas. On top of this, wind energy uses almost no water compared to fossil-fuel extraction, which

contributes immensely to water shortages, an important added advantage in countries with water scarcity.

Conclusion

Vestas recognizes that special assistance is critical for the poorest and most vulnerable countries to address climate change. Critical elements that should also be pursued include: a real commitment to development and climate change financing; focused and effective capacity building efforts; real support for renewable energy infrastructure; and steady, long-term and predictable rules. A “SEFTA”- agreement would be an important step in the right direction and should be supported with equal determination by developed and developing countries alike.



Fact Box**SEFTA proposal: Breaking the deadlock in international trade negotiations**

National governments must create clear, predictable and long-term policies to promote investor confidence.

Governments must:

- provide a clear ambition level, e.g., targets for sustainable energy uptake in national and regional markets;
- modify existing utility and market regulations to ensure that industry structures and incentives are consistent with these ambition levels;
- provide support mechanisms to improve the commercial case for investment to overcome existing market distortions;
- install necessary infrastructure to ensure flexible distribution and transmission networks and other required delivery mechanisms are in place;
- provide policy support for the dissemination of renewable energy technology until volume is sufficient to drive unassisted consumption; and,
- reward end-use efficiency and allow for market-based mechanisms to deliver energy efficiency to consumers.

Furthermore, international cooperation among governments is required to foster the growth of sustainable energy.

The Council proposes creating a Sustainable Energy Free-Trade Agreement (SEFTA) through the G20. This would require G20 leaders to agree and commit to ending subsidies for fossil fuels - coal, oil and gas - which according to the International Energy Agency (IEA) amount to USD 310 billion annually. By comparison, all investment worldwide in clean energy in 2008 amounted to USD 155 billion, of which around USD 60 billion took the form of subsidies.

Membership in SEFTA would require four additional commitments to:

- agree on national removal of all fossil fuel subsidies and report potential phase out arrangements in an international register;
- remove all tariffs and taxes on clean energy products, services and feedstocks;
- agree on common standards for clean energy technologies, to ensure larger markets and interoperability; and, other environmental costs, and public health and security costs.

Optimally SEFTA would eventually grow beyond G20 membership, as other countries feel able to make the same commitments.

To make SEFTA a reality:

- The G20 leaders' commitment is required;
- The establishment of a Secretariat for coordination, communication and (crucially) verification is needed;
- The Secretariat could monitor and verify progress towards the existing pledge to remove fossil fuel subsidies; and,
- A steering committee consisting of finance, trade, industry and environment ministers would need to collaborate with other international energy agencies and lending institutions.

Source: World Economic Forum, 2009



Peter Brun

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A compass towards a greener economy

Luiz Eduardo Fróes do Amaral Osorio and Paulo Bento Maffei de Souza

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How does Raízen, a recently created Joint Venture between a major oil company and the largest global sugarcane producer, plan its way towards sustainability? The answer lies in the creation of a Sustainable Development Compass that may minimize uncertainties in a moment when many organizations are trying to create their strategies towards a greener economy. This article comments on the broad foundations for this Sustainable Development Compass and on the company's particular reasons for creating it.

Opportunity or trouble ahead?

The current situation regarding energy-related environmental issues is well known. However, there are two points worth noting when setting the context for future energy scenarios: the expected gap between supply and demand and climate change. As much as these present difficulties ahead, they also offer opportunities.

Looking at the energy context, according to current forecasts, the relationship between energy supply and energy demand may not be entirely compatible. Shell Energy Scenarios for 2050 shows us that, in four decades from now, energy demand could be three times what it was in 2000. Even taking into account the fact that new developments in energy efficiency could reduce future demand by 20% and that supply could increase by 50%, the supply-demand gap would still be as big as the entire energy industry in 2000 (400 EJ/a)ⁱ. We need, therefore, an enormous growth in the supply of sustainable energy supply as well as a serious reduction in demand.

The other context is human responsibility in, and possibilities to mitigate, climate change. Research has shown that CO₂ and CH₄ emissions have regularly been going

up and down over the last 800,000 years with a positive correlation to temperatureⁱⁱ. Nowadays, however, CO₂ and CH₄ have shown an unprecedented increase in concentration. The transport sector alone makes a major contribution to this new and worrisome situation, accounting for, in 2007, 25% of green house gas (GHG) emissionsⁱⁱⁱ. If no action is taken succeeds to reverse this trend, by 2050 this share may reach 80%^{iv}.

Transport and its infrastructure are inherently dependent on, and adapted to, dealing with liquid fuels. On the one hand, although this dependence locks society into the existing infrastructure, on the other, it opens up possibilities for other types of liquid fuels rather than fossil, such as sugarcane-based bio-ethanol. As an indicator of the significant carbon savings from this renewable fuel, each unit of fossil energy required to produce sugar cane ethanol generates approximately 9 units of renewable energy^v.

Can we transform the huge gap between energy demand and energy supply for the coming decades into an opportunity? Can we do it while significantly reducing GHG emissions? And last but not least, can we do it sustainably?

Raízen's sustainable development strategic needs

This is the context in which Raízen, a joint venture between Cosan and Shell, was created.

Shell, a major global oil company, is a leading bio-fuels distributor, some 9.5 billion litres in 2010. Shell has been present in Brazil since 1914 and has invested all its distribution assets in this joint venture with Cosan.

Cosan, a leading Brazilian bio-energy company in the sugarcane sector, has grown enormously in the last ten years. As an indicator, the company's sugar cane crushing capacity grew from 15 million tonnes per year in 2000 to more than 60 million in 2010. In 2008, Cosan acquired Exxon's distribution assets in Brazil to expand its business portfolio.

Raízen started with 24 sugar and ethanol mills managing over 700,000 hectares, with a distribution capacity of 21 billion litres per year and over 40,000 employees. It is the fifth largest Brazilian corporation by revenue and its electricity cogeneration capacity is enough to supply a city the size of Rio de Janeiro. In the next five years,



Raízen plans to reach a crushing capacity of 100 million tonnes per year.

As a private company, Raízen needs not only to deliver profits to its shareholders now, but also sustainably over time. This will only be possible if sustainable development is seriously taken into account in its operations and expansion.

There is no question that sugarcane based bio-ethanol is an excellent fuel both because of its environmental benefits and the way it requires only small adjustments to fit the current transport system infrastructure. But does producing an environmentally beneficial fuel through good practices, in itself, make a company sustainable? The answer is no: in order to sustain itself over the long term, an organization needs to reference its strategy on long lasting and scientifically sound guidelines.

We are confident that the financial aspects of sustainable development can be taken care of through traditional management. Both Shell's and Cosan's histories show that Raízen started out quite well prepared in that respect. The question is then: what should we add to traditional management in order to ensure

that Raízen's activities continue moving in a good direction when it comes to the environmental and social aspects of our operations? What should our compass be?

The answer is: we need a robust set of environmental and social guidelines that, if smartly added to traditional management, would result in a solid sustainable development management system. This should focus on the core business, while at the same time, encompassing the three aspects of sustainable development: economic, social and environmental. Ideally this set of guidelines should be small and easy to understand. To be permanent and unchallengeable, it should also be grounded in universally accepted natural science and social principles. Lastly, we should not be afraid of finishing up with a stringent set of guidelines if that is what it takes to steer the organization towards a greener economy.

Sourcing robust strategic sustainable development guidelines

Among the many definitions of sustainable development that we might use to develop our own set of guidelines, most offering a legitimate and well written

ethical approach to the theme, there is one that is very concrete and based on universally accepted science. In late 1980s, a Swedish group of scientists began a study on systemic conditions for sustainable development. Eventually, that study group developed into a larger network of scientists in pursuit of a definition of sustainability principles that should meet the following conditions:

- ☞ Be based on universally accepted science;
- ☞ Be necessary to achieve sustainability;
- ☞ Be generic enough to fit all social activities;
- ☞ Be concrete enough to allow for critical scrutiny of operations and strategic planning; and,
- ☞ Be non-overlapping;

Some of these scientists later created a foundation named The Natural Step and defined four Sustainability Principles, or System Conditions for sustainability, as these principles are often referred to. The following sciences laid the necessary foundation: physics, chemistry, geology, biology, ecology, systems dynamics and social sciences. The four Sustainability Principles^{vi} are:



In a sustainable society, nature is not subject to systematically increasing:

1. concentrations of substances extracted from the earth's crust;
 2. concentrations of substances produced by society;
 3. degradation by physical means;
- And, in that society,
4. people are not subject to conditions that systemically undermine their capacity to meet their fundamental needs¹.

These sustainability conditions are declared as limits to human activities and this is why the phrases are in negative form. While compliance with them is not easy to achieve, smartly combining these four conditions with solid strategic planning would deliver a robust tool to steer any organization, large or small, public or private, towards sustainability and would eventually result in a non-destructive operational impact.

A strategic approach to sustainability must happen step-by-step and at a pace businesses can cope with. Not slower, not faster. In order to ensure the right direction, it is necessary to backcast² from compliance with the Sustainability Principles. Backcasting means “placing ourselves in the future and imagining that

we have achieved success. Then looking back and asking the question: ‘how did we achieve this?’”^{viii} This is an excellent way to identify strategic stepping stones paving the way forward.

We at Raízen realized that this approach could provide us with our tool, since it appears to be a very intelligent way of maintaining stringent and uncompromising social and environmental goals while, at the same time, acknowledging business reality. What we did, then, was to define our own set of guidelines based on these four Sustainability Principles and prepared our own way of combining them with our traditional management systems. We named our set of guidelines ‘The Sustainable Development Compass’ and merged them with our traditional business approach.

Implementation

From the definitions above, it is clear that Raízen’s strategic approach to sustainable development is simple, grounded in practical experience and in scientifically sound principles. In short: the Sustainable Development Compass brings some conditions that can guide the continuous improvement of Raízen’s operations and

corporate activities towards a greener economy. However, what can we do that might result in concrete, on-the-ground, implementation of sustainability practices? How can we take steps towards tangible results? For us, there are two answers.

The first is that every ordinary business activity, either on the operational or corporate side, must advance the company towards compliance with the guidelines defined in the Sustainable Development Compass, regardless of how long it takes to get there. This approach is likely, over time, to help operations strengthen the natural systems upon which they depend for resilience and steadiness. To that end, the focus must be on both the productive areas and the preserved ones. Attention must also be on current operations and future expansion of activities.

These efforts to comply with strategic sustainability guidelines may help preserve soil fertility, water and air quality, as well as ecosystems, species and genetic diversity. We also expect this approach to help operations increasingly respect and benefit employees, suppliers, contractors, local communities and society at large. We are confident as well that it will result in industry leadership in sustainability



matters, social license to operate, stakeholder respect, goodwill, brand value, reduced turnover and reduced environmental and social risks. Finally, we expect this approach to facilitate market access through easier adaptation to different certification schemes.

This brings us to the second response: the need to deliver concrete results. Certification, according to standards that comply with our Sustainable Development Compass, may help our movement towards sustainability. To this end, Raízen has chosen Bonsucro as its main certification scheme and, in June 2011, received the first certificate ever granted by the new standard. This is quite a meaningful pioneering step since Bonsucro is a multi-stakeholder organization, which, since 2005, has been developing a certification

system specifically designed for the sugarcane industry. After a broad, global multilateral consultation process and, after following the ISEAL³. Best Practice Guidance for the development of social and environmental standard systems, the London-based Bonsucro organization finally launched its certification scheme.

Raízen, whose shareholder Cosan had already started to adjust to this upcoming standard in 2008, had one of its mills audited by an independent third party in June 2011 and was granted the first certificate on the new Bonsucro set of criteria. On the economic side, Raízen has already entered into a commercial contract based on the new certificate. This is an important step in delivering concrete results in line with the strategic guidelines of our Sustainable Development Compass.

Value chain engagement

However, working within the walls of the organization is not enough. We know from previous experience that it is fundamental to accompany this with the entire value chain. A broad web of interconnections makes every company depend on its relationship with other players. Within this context, all value chains depend on a supporting social and natural environment. No company can be sustainable if its business partners are not. Therefore we focus our attention on our suppliers, contractors and customers.

As an example of Cosan's previous experience in this area, in 2007, one of its customers, a Swedish company by the name Sekab, needed to source fuel ethanol in compliance with some sustainability requirements derived from a very specific Scandinavian market demand. At that time, there was no certification scheme such as the recent Bonsucro standard. Cosan and a number of other producers had, together with Sekab, to agree on a bilateral set of sustainability criteria in order to comply. As a result, Cosan and the other producers entered into a contract with Sekab that required the involvement of suppliers and contractors in order to live up to the scrutiny of a third party independent verification. This was the first ethanol purchase and sale agreement with independent verification of sustainability clauses. In the sugarcane-based biofuel sector, this was a pioneering experience of the benefits of involving the value chain in an integrated sustainability approach. Sekab was able to source ethanol within the desired sustainability guidelines. On its side, Cosan, the other producers, as well as suppliers and contractors, gained a stable contract and demonstrated good practice in a very demanding market.

Most of our focus so far has been on suppliers and contractors. When renewing their contracts with us, we include sustainability clauses and follow up on them. For obvious reasons, this must be a step-by-step approach. However, we must also mention our firm intention to work together with our customers. We are well aware that it is not easy to achieve a sound strategic approach towards

sustainability. As we develop and implement our own path, we welcome the opportunity to work with our customers, share our knowledge with them and learning from them. The more we cooperate with the entire value chain in terms of sustainability, the safer our operations will be and the more confident we will be in the long-term future.

Final remarks and expectations for the future

There is evidence that societies' collapse or survival depends on a number of factors, among which we can highlight ordinary daily activities in relation to the resilience of the supporting environment.^{viii} We also know that the performance of these day-to-day tasks – such as energy usage in all

its forms, including that in transport systems – is envisaged long before it actually takes place, either through good planning or through random development.

Although we advocate for robust planning towards sustainability, Raízen's Sustainable Development Compass is not meant to solve the first point we raised at the beginning of this article, namely the huge gap between energy supply and demand that humanity is likely to face in the coming decades. The creation of Raízen, however, offers in itself a part of that solution, both in terms of energy production and in terms of role modelling. Using our Sustainable Development Compass may, apart from guiding us towards sustainability in its broadest sense, render our operations and thus our product

even more efficient than they already are to deal with the second point of the overall context of this article: climate change.

Those familiar with the work of Adam Smith know that apart from 'The Wealth of Nations', he also wrote 'Theory of the Moral Sentiments', where he states that self-interest has to be pursued by people of conscience, informed by their capacity for moral awareness. That piece of advice gives a pointer to the direction of sustainable capitalism. We at Raízen are concerned with the state of the planet. At the same time, we are comfortable in saying that our goal is to be profitable by contributing sustainable energy to society and, in doing so, to help create a better future ◀

Endnotes

- 1 In the original article we refer to, the phrase of the fourth sustainability principle was different. It later evolved to what we transcribe here.
- 2 Backcasting is a term created to oppose the concept of forecasting in strategic planning. When backcasting, the end goal is pre defined and secure. If forecasting is used to define end goals, it can only result in the easiest ones and not necessarily in the 'must-achieve' ones. Therefore, when dealing with sustainability issues, forecasting should be used in combination with backcasting in order to steer towards the ideal end goal while acknowledging the real context along the way.
- 3 The ISEAL Alliance is a global association for social and environmental standards that works with companies, non-profits and governments to support adoption of voluntary schemes.

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Yann Arthus-Bertrand GoodPlanet Foundation

Born in 1946, Yann Arthus-Bertrand has always had a passion for the animal world and the natural environment. In 1967, he settled in central France and became the director of a nature reserve. During an overseas experience in Kenya where he studied a family of lions, he started taking photos from a hot-air balloon and discovered aerial photography.

2003

In 2003, Yann Arthus-Bertrand launched the project *Six Billion Others*, which was exhibited in Paris's Grand Palais in January and February 2009 and is now on tour around the world. A team of film directors went to meet men and women all over the world and recorded on video the testimonies they received on general themes (such as life, death, love, hate, etc).

www.6billionothers.org

He then created the foundation *GoodPlanet* in 2005, a non-profit organization that aims to raise public awareness of environmental issues and to develop concrete solutions towards a more sustainable way of life - one that is more respectful of our planet and its inhabitants.

www.goodplanet.org • 2005

1991



In 1991 he founded *Altitude*, the world's first aerial photography agency. In his own work, he turned his attention towards long-term projects, books and exhibitions, that examined the links between man and nature. His book *The Earth from Above* is the highlight of this new perspective and led the way to future projects.

2012

As an independant film Director, Yann Arthus-Bertrand has just founded a non profit production company «*Hope production*».

For the World Water Forum in March 2012, Yann Arthus-Bertrand, in collaboration with Baptiste Rouget Luchaire and Thierry Piantanida, is producing a film narrating the history of water and reminding us that reasoned management of water is a crucial challenge for our century.

For *Rio+20*, Yann is also working with the director Michael Pitiot on the film "*Planet Ocean*". This film aims to promote understanding of the importance of the oceans in the ecosystem and recognition of their strategic value, leading to the conclusion that international governance of the oceans is now a vital necessity.

2011

To launch the official UN declaration of year 2011 as the International Year of the Forest, Yann Arthus-Bertrand produced a short-film, a book, an educational poster campaign and an exhibition on the theme of **FORESTS AND PEOPLE** in parallel with the United Nations Forum on Forests (UNFF), as well as participating as a distinguished member of the jury at the UN International Forest Film Festival.

www.goodplanet.org/forests

2010

GoodPlanet Foundation launched *10:10* in France, a campaign to get individuals, companies and institutions to reduce their carbon footprints by 10% during 2010.

www.1010.fr/



"*GoodPlanet Solidarity*" was set up to implement bioclimatic schools in Northern Africa among others projects in developing countries.

www.goodplanet.org/spip.php?article348

In partnership with ADEME (the French Agency of the Environment and Energy Management) he developed [Action Carbone](http://www.goodplanet.org/actioncarbone-en.html), which offers institutions, companies and individuals the possibility to calculate, reduce and offset their greenhouse gas emissions by changing their own impact and by funding renewable energies, energy efficiency or reforestation projects, carried out by NGOs in the global South.

www.goodplanet.org/actioncarbone-en.html



2006

This was followed by projects such as [Why Sustainable Development?](http://www.goodplanet.org/sustainable-development-why.html) in collaboration with the French ministries of Education and of Environment. This is an educational exhibition free to schools, which includes his aerial photographs accompanied by a series of texts that can be used for educational purposes by teachers.

www.goodplanet.org/sustainable-development-why.html



In August 2008, the project [GoodPlanet Junior](http://www.goodplanet.org/goodplanetjunior-en.html) was launched in collaboration with the French League of Education. It offers vacation schemes to disadvantaged youngsters and teaches them about eco-citizenship whilst spending time in protected natural surroundings.

www.goodplanet.org/goodplanetjunior-en.html

2008

These projects have one common thread: The GoodPlanet Foundation's desire to act by suggesting concrete solutions to the public that will enable us to put the environment at the core of our consciences

2009



Yann Arthus-Bertrand was designated [Goodwill Ambassador](#) for the United Nations Environment Programme on Earth Day (April 22nd, 2009) in recognition of his outstanding advocacy work for the environment. He was also named a UNEP 2009 Champion of the Earth in the category "[Inspiration and Action](#)."



Yann Arthus-Bertrand undertook the production of a full-length feature film: [HOME](#). It deals with the state of our planet and the challenges we will have to face if we do not protect it.

www.homethemovie.org

Home



2009

The GoodPlanet Foundation attended the UN climate conference in Copenhagen in December 2009 with a new film "[6 Billion Others - Climate Voices](#)," and organized a film festival showing documentaries on climate and the environment at the Danish Film Institute.

GoodPlanet.org

PART

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Green transitions around the world

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Europe is leading by example – the green economy offers opportunities and benefits for all

Connie Hedegaard

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EU Commissioner Connie Hedegaard paints an optimistic picture, seeing opportunities in the 'green growth' model, notably the economic dynamism of innovation and related job creation, as well as a competitive environment in green technologies. She highlights EU leadership in setting emissions targets and outlines EU plans for an investment framework in the transition to a low-carbon economy as well as concrete measures to increase energy efficiency. Ms Hedegaard also describes EU plans for national accounts to integrate a broader range of social and environmental indicators to complement Gross Domestic Product (GDP), part of a worldwide trend to underpin sustainable development.

When my grandmother was born, there were not even two billion people living on this planet. When I was born, we were already over three billion. When my children are my age, the global population will have grown to over 9 billion. At the same time more people are escaping poverty and becoming better off. This is, of course, excellent news, but it also presents us with a challenge.

The planet's resources are limited and we are already exhausting them at an alarming rate. For instance, every day 24,000 football fields of forests are burned or felled, causing the loss of ecosystems and affecting our climate in terms of less precipitation. Today's fishing fleets harvest nearly seven times their catch in 1950, with the result that 80% of our fish stocks are fully exploited, or even over-fished, leaving no room for further growth. And, 20 years from now, the available water supply will satisfy only 60% of world demand.

In short, we have entered an era in which humanity's impact on the planet is altering the stability of the climate and threatening the very ecosystems upon which we depend for our prosperity and well-being.

As the world's population continues to grow, more than a billion more people will enter the middle class by 2050. Again, this is to be welcomed. But, the fact is that, if

they use the production technology and adopt the consumption patterns that prevail in industrialised countries today, we would need at least two and a half planets to meet mankind's demands. Building more sustainable models of development and adopting sustainable patterns of consumption and production are the obvious answers to this challenge.

The Rio+20 conference in 2012 will be an important opportunity to accelerate this process. I have the honour of being a member of the Global Sustainability Panel, which UN Secretary-General Ban Ki-moon has set up to formulate a blueprint for a sustainable future as a key input to the Rio+20 preparations.

A new paradigm for sustainable development needs to be based on two elements. First, it must secure people's basic right to food, water and energy, give them access to social protection, education and health services, and allow them to participate in their own governance. Second, it needs to build on a 'green economy' approach which emphasises the inherent role of ecosystems and environmental protection in fostering economic prosperity. Climate change threatens both of these elements. Preventing climate change from reaching dangerous levels is therefore fundamental to sustainable development.

The international community has recognised that global warming should not exceed a 2°C temperature increase. This limit is widely seen as a key tipping point, beyond which irreversible and potentially catastrophic changes in the global environment will become much more likely. Yet science tells us that we are most likely heading for a total global temperature increase of as much as 4°C by the end of this century and, in the worst case scenario, more than 6°C. Such levels of warming would represent runaway climate change, which would carry enormous human and economic costs. The landmark Stern Review of the economics of climate change estimates that uncontrolled climate change could cost the world as much as one-fifth or more of its annual GDP in the long term.

It is evident that global action is needed to prevent these nightmare scenarios from becoming reality. To keep within the 2°C ceiling, global emissions will need to be at least halved from their 1990 levels by the middle of this century. This calls for a comprehensive, legally binding global agreement covering greenhouse gas emissions from all major economies. The Copenhagen and Cancun climate conferences have brought important progress towards such a deal, but we are not there yet. Data released by the International Energy Agency (IEA) in May 2011, showing



that global emissions reached their highest level ever in 2010, underlines the urgent need for further progress.

It goes without saying that the richer countries of the world have a duty to help poorer nations, especially the least developed countries, face up to the climate challenge. For the European Union (EU), as the world's biggest provider of official development aid (ODA), climate change has become a major funding priority over the past decade. The EU and its member states have committed to provide EUR 7.2 billion in 'fast-start' climate finance to developing countries over the 2010-2012 period and we are on track to deliver. Together with the rest of the developed world, we are also committed to increasing total climate finance to developing countries to USD 100 billion a year by 2020.

Climate change is no distant or future threat. We are already witnessing more frequent and more severe extreme weather events around the globe. We need only think of the floods in Pakistan and Brazil in 2010 and in Australia at the start of this year, the heat wave and forest fires in Russia last year, or the worst drought for decades that is affecting parts of China and India. More recently, deadly tornadoes have caused widespread damage in the United States.

The consequences of these dramatic events are felt not only in the regions directly affected but also by consumers around the world, for example through

higher food prices. Globally, we are paying almost 40% more for our food in 2011 than in 2010.

This is, of course, not due to climate change alone. Higher food prices are the reflection of many factors, including increases in the price of oil, on which the intensive system of agricultural production that prevails today in developed countries depends. But climate change exacerbates such trends. It is a threat multiplier. It is a further compelling reason for making the transition to a sustainable model of development and consumption.

The 'green growth' model needs to be one that reduces our ecological footprint, emits much lower quantities of greenhouse gases and uses less energy and fewer raw materials. This is a huge challenge - but also a huge opportunity. These changes will require technological innovation - and innovation is what makes an economy dynamic. It is what drives growth and job creation. Furthermore, an economy that is more sustainable, more resource-efficient and lower in carbon also promises greater energy security and better quality of life, for example through cleaner air and water, which in turn translate into better public health.

In Europe, the transition to a low-carbon society is already well under way. Back in 2007, EU leaders committed to transforming Europe into a highly energy efficient, low greenhouse-gas emitting economy and fixed a set of ambitious medium-term climate and energy targets to be met

by 2020. Europe will double the share of energy we get from renewable sources to 20% in 2020 and we will improve energy efficiency by 20%. Europe will, according to the Member States' Plans, reduce its emissions of greenhouse gases by at least 20% and, with an enhanced focus on energy efficiency, move into the 25-40% range as recommended by the Intergovernmental Panel on Climate Change (IPCC).

Europe's leadership in successfully setting out these 2020 targets put pressure on our international partners to come forward with emission targets of their own in time for the Copenhagen Conference at the end of 2009. Today some 90 countries in the developed and developing worlds alike have set domestic targets for reducing their emissions. Even if these pledges are not yet enough to keep global warming below 2°C, they are no small achievement. The right direction is set for a sustainable pathway but we need to speed up the implementation.

European leaders have set a cut in emissions by 80-95% as the objective for 2050. We need to plan today for the long term in order to create the right framework for investment in the more sustainable, low-carbon solutions we require. In March 2011, the European Commission set out a Roadmap for the transition to a low-carbon EU society by 2050. The analysis shows that the EU can by then reduce its emissions by at least 80% through domestic measures alone and on the basis of technologies that exist today.



To do so, the EU would need to raise its overall investment level from 19% to 20.5% of GDP. To put it in perspective, this 1.5% increase would simply take us back to the investment level seen before the economic crisis. And the additional investment would be largely, or even entirely, paid back by energy savings. The analysis shows that, by shifting to a low-carbon economy, the EU can halve its imports of oil and gas by 2050, thus greatly reducing our dependence on fossil fuels from abroad.

The most cost-effective way to achieve these changes is to continue improving energy efficiency. That is why, for instance, the European Commission is proposing to raise the refurbishment rate of public buildings. Buildings are responsible for 40% of Europe's energy consumption and emissions. Governments should take the lead in improving this. We are therefore proposing that EU countries should retrofit 3% of public buildings every year. That is double today's rate and will have a real effect on the market.

The money we save on energy could instead be invested in developing climate-friendly technologies and appliances, or smart infrastructure. This could generate new sources of growth and jobs – jobs that cannot be outsourced.

Though we are among the first to develop a roadmap to 2050, Europe is by no means alone in shifting towards the low-carbon economy. Indeed, companies and governments around the world are engaged in a

race to gain the biggest possible share of a market that is growing rapidly and set to continue doing so. Last year, a record of nearly USD 250 billion was invested in clean energy technologies in the G20 countries, 30% more than in 2009, according to one study.

Europe still leads the market but China is catching up fast. It attracted almost 40% of clean technology investment last year. India was also one of the most successful countries in attracting private investment. Now it looks like China will out-invest the EU in renewable energy and grid infrastructure. Under China's new five-year plan, seven priority industry sectors will move from a share of 3% of GDP today to 15% by 2020. Meanwhile South Korea's green growth plan foresees up to 1 million jobs by 2020. And let us not forget the almost USD 90 billion the US is putting into green technologies and infrastructure as part of its recovery package.

This race to the top is exactly what is needed to kick-start the low-carbon revolution around the world. For Europe, this competition means we have to redouble our climate action if we want to remain in the vanguard of this transition and reap a maximum of economic benefits. Our low-carbon roadmap points the way forward for businesses and governments by setting cost-effective milestones for reducing our greenhouse gas emissions after 2020: a 40% cut below 1990 levels by 2030 and a 60% cut by 2040, on the way to an 80% reduction in 2050.

Our experience in Europe shows that it is possible to break the link between economic growth and emissions. Thanks to a battery of measures we have taken to tackle emissions, they are now more than 14% below their level in 1990; whereas the EU economy has grown by more than 40% and manufacturing has expanded by more than a third over the same period. By far the most important of the measures we have introduced is the EU Emissions Trading System (EU ETS), a cap-and-trade scheme which covers 50% of our carbon emissions. Europe is also the main source of investment in emission-saving projects undertaken in developing countries through the Kyoto Protocol's Clean Development Mechanism (CDM), since most CDM credits can be used in the EU ETS.

In pursuing the global drive towards the sustainable development that we need, we must include a new way to measure human progress and wealth.

Since the 1950s, GDP - gross domestic product - has been the economic indicator of choice. It has come to be seen as the key measure of a nation's success or even its well-being, yet GDP is, in fact, no more than an indicator of economic activity. It does not capture the natural wealth of a country nor issues that are crucially important to the quality of our lives such as a clean environment or social cohesion. Something that is bad for society as a whole, such as a natural disaster, can actually boost GDP because the reconstruction work that follows it increases



economic activity. No matter if precious natural resources like forests or farmland were lost in the disaster - their value is not measured by GDP anyway.

This is not the fault of GDP itself, of course, but it is a problem when GDP is wrongly understood as the unique yardstick for progress. If boosting GDP is seen as the only measure of success, policymakers can be misled into doing more harm than good.

Tropical forests are a classic example. Felling a forest brings a one-off increase in GDP in the short term, but at what cost in the long term? The forest and the ecological functions it provided, such as water purification and carbon absorption, are lost for good. And the soil the trees stood on is often too poor to support farming and quickly turns to dust.

In a century that risks being marked by climate change and increasing resource scarcity, it is time to develop a broader measure of progress and wealth to underpin sustainable development. We need to go beyond GDP.

This does not mean abolishing GDP, but rather complementing it with environmental and social indicators to gain a more comprehensive picture. It also means drawing up environmental and social accounts to go alongside traditional national economic accounts. The European Commission is working on introducing these innovations as part of our 'Beyond GDP' initiative which also involves the OECD, the European Parliament and non-governmental organisations. The Commission adopted a concrete road map for action two years ago and the first items have been delivered, including a Regulation on integrated environmental-economic accounting adopted on 7 June 2011.

Much work on integrated environmental-economic accounting has also been done internationally, including within the UN system. The Rio+20 process should focus global attention on these issues and accelerate the development of the practical tools that are needed to help countries across the world start implementing a better measure of their progress towards sustainable development.

To meet the objective of remaining below the 2°C temperature increase, we still need to do much more in terms of emission reductions. But there are grounds for optimism with green growth at the centre of economic policies in many countries around the world; not only due to concerns for dangerous climate change, but also energy security and, last but not least, national interests in ensuring sustainable growth. It is, indeed, good news when the economic agenda aligns with the environmental agenda ◀



Connie Hedegaard

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Towards green business - financing organic waste composting in Bangladesh

Iftekhar Enayetullah and A.H.Md.Maqsood Sinha

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Iftekhar Enayetullah and A.H.Md.Maqsood Sinha describe the early challenges and current activities of Waste Concern, which transforms household and city waste products into compost. The firm, a joint venture between a Bangladesh entity and a Dutch waste management company, also benefitted from funding under Clean Development Mechanism (CDM) of the Kyoto Protocol. The authors outline their experience with the venture and provide a series of recommendations for governments of the region to adopt for the successful and profitable processing of city waste.

Background

Promoting the concept of waste as a resource and putting a market value on organic waste are primary interests of Waste Concern. Working in partnership with communities, it undertakes waste management in Dhaka, Bangladesh, implementing a house-to-house waste collection system, with promotion of source separation of waste.

Waste Concern also undertakes the collection of waste from vegetable markets. Household and market waste are taken to a composting plant where they are transformed into organic fertilizer. To ensure utilisation of the fertilizer and to sustain this system, it contacts and negotiates with fertilizer companies to purchase and nationally market the compost by-product or 'bio-fertilizers'. This process also assists communities in marketing the product.

The system introduced by Waste Concern has created a chain reaction among many sectors in Bangladesh. It has expanded the organic fertilizer industry and has created new entrepreneurs. It is providing jobs to the urban poor, who are hired to do the job of waste collection and processing. It has stimulated behaviour changes in urban communities, who have begun to

appreciate the value of waste, and also among professionals, who learn how to orient communities towards waste management.

These stakeholders also experience the impact of converting waste into a resource. Amidst these changes, Waste Concern has helped to address the environmental problems of diminishing topsoil fertility (due to the use of synthetic fertilizers and pesticides) and greenhouse gas (GHG) emissions. A good indicator of the success of Waste Concern is the government's inclusion of composting and recycling in the National Safe Water and Sanitation Policy, as well as in the National 3R Strategy for Waste Management. The government has also encouraged the promotion of source separation of waste since 2010.

The challenges that created the system

The management of an increasing volume of solid waste in urban areas has become a serious problem in Bangladesh. Intensifying economic activities due to increasing urbanisation and rapid population growth are contributing to the generation of 15,000 tonnes of urban waste per day

nationwide. The World Bank predicts that, in 2025, Bangladesh will generate 47,000 tonnes of waste daily in urban areas.

In Dhaka, 3,500 tonnes of waste are generated per day, of which 80 per cent is organic. However, Dhaka City Corporation (DCC) collects only 50 per cent of the waste. At this rate, it is unable to take care of additional increases in the city's waste. As a result, more uncollected waste is piled up on the roadsides or dumped into open drains and low-lying areas, further deteriorating the environment and the quality of life. This is despite the fact that almost 80 per cent of the waste is organic and can be converted into compost or soil conditioner. Thus, this potential of waste as resource is unseen and the new resource remains unutilised. Opportunities for developing partnerships between the government and stakeholders in waste management (who will engage in composting or recycling to reduce waste) are not explored because of the absence of a waste management policy. Waste reduction, reusing, recycling, and segregating waste at source or at the household level are not commonly practised.

The concept's innovative financing

The concept of Waste Concern helped Bangladesh seize a new opportunity for foreign direct investment using the Clean Development Mechanism (CDM) of the Kyoto Protocol. This was achieved by successfully developing a city-scale composting project to reduce GHG emissions while improving the environmental condition of the disposal site.

Objectives of the Clean Development Mechanism (CDM) project

The CDM project has been designed to:

- develop a sustainable model for solid waste treatment based on recycling;
- establish a large-scale composting plant for the resource recovery of organic waste from the households and vegetable wholesale markets in Dhaka City;
- develop an alternative solid waste management system to reduce the burden on the municipality, especially on landfills;
- create job opportunities for the urban poor, especially women and waste-pickers, and
- save hard currency at the national level and strengthen the trade balance by substituting, in part, chemical fertilizer with locally produced compost.

Brief description of the project

The project as submitted to the United Nations Framework Convention on Climate Change (UNFCCC) is called 'Harnessing CDM for Composting using Organic Waste'. It is a joint venture between Waste Concern and World Wide Recycling BV of the Netherlands. It represents the first compost project registered successfully with the UNFCCC and the first organic waste recycling project in the world to claim carbon credits. For its implementation, Waste Concern and World Wide Recycling BV created a joint venture company called WWR Bio Fertilizer Bangladesh Ltd. The project is anchored in a 15-year concession agreement between Dhaka City Corporation (DCC) and WWR Bio Fertilizer Bangladesh, Ltd, signed on 24 January 2006.

The significant features as described in the terms of the concession agreement are:

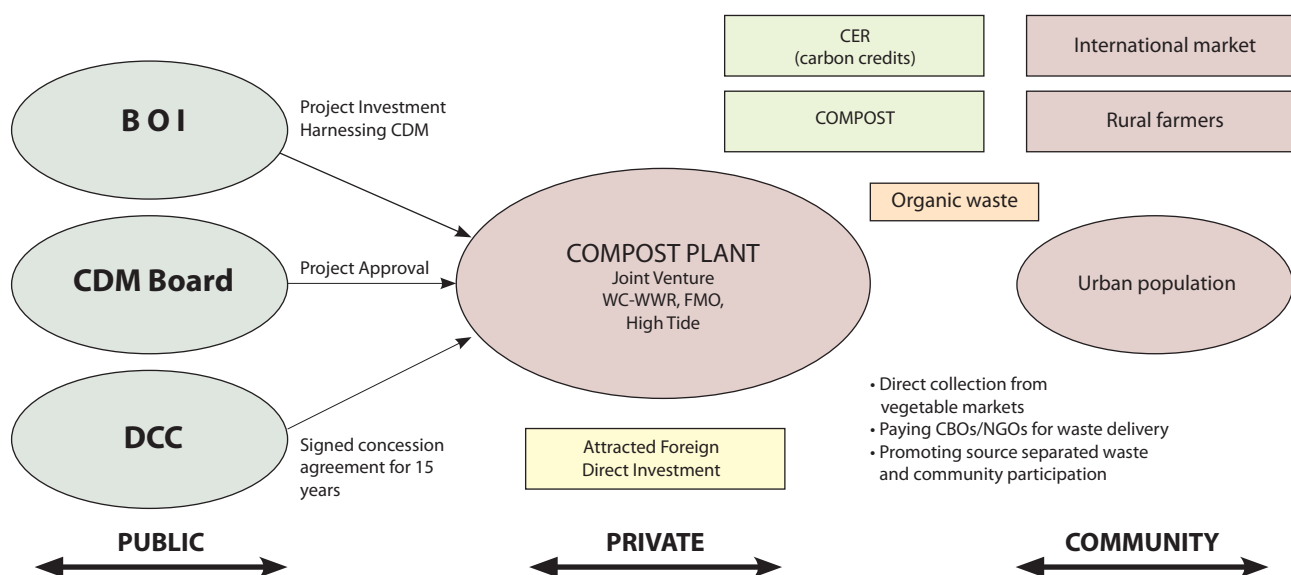
- WWR Bio Fertilizer Bangladesh Ltd has the exclusive right to collect 700 tonnes of organic waste (in phases) from different markets and areas of in Dhaka City on a daily basis.
- Three compost plants will be established around the city. The first plant, which commenced construction on 25 November 2008, has a 130-tonne-per-day capacity. It is located in Bulta, Narayanganj (25 km south-east of Dhaka City).

- Vegetable waste from the market is collected using the project's own transport networks and taken to a compost plant built on land owned by the project. For the collection of waste by WWR Bio Fertilizer Bangladesh, Ltd, DCC will make no payment.

How the Public-Private Partnership (PPP) works

The project is not a conventional public-private partnership (PPP) because it does not involve a government agency as partner sharing the profits as well as the risks. It may be better categorised as a public-private cooperation project. The participation of the government is through the DCC, which has granted a concession to the private company WWR Bio Fertilizer Bangladesh, Ltd, to collect and process waste. WWR Bio Fertilizer Bangladesh Ltd will self-finance its collection and processing activities. It will procure vehicles to transport waste and build composting plants. There is no investment on the part of the DCC. On the other hand, WWR Bio Fertilizer Bangladesh Ltd has Waste Concern and its Dutch partners – World Wide Recycling BV, FMO Bank and High Tide – as joint venture partners.

Figure 1: PPP Model used in Dhaka



The carbon financing set-up

The breakdown of the EUR 12 million project financing is:

- 38 per cent: EUR 4.6 million equity;
- 45 per cent: a EUR 5.4 million soft loan from FMO Bank and Triodos Bank;
- 17 per cent: a EUR 2 million loan from a local bank in Bangladesh.

Current state of affairs and expected results

The first 130-tonne-per-day compost plant was in operation by 25 November 2008. The second plant is awaiting construction because of a delay in obtaining an electricity connection from the state-owned utility due to a national energy crisis and the halting of new connections since 2009; new industries are expected to be connected by the fourth quarter of 2011.

The salient facts of the project are that it:

- collects 700 tonnes of waste per day from the DCC area in 3 phases;
- produces 50,000 tonnes of compost per year;
- saves 89,000 tonnes of methane gas emissions per year;
- provides jobs to 800 urban poor residents;
- costs EUR 12 million.

The project also helps the poor: it is not fully mechanised and thus provides an opportunity to employ people from the informal sector at a salary higher than government rates, offering them good working conditions, health insurance, a day-care facility and free meals. In addition, the compost produced is cheaper than chemical fertilizers; it helps poor farmers improve the health of their cultivable soil as well as providing expectations of higher production. Finally, apart from its positive environmental impact, the project helps municipalities reduce their waste management budget.

The two sources of project cash flow are sales proceeds from compost and certified emissions reduction (CER); 20 to 25 per cent of each tonne of organic waste is transformed into compost, whose price at the factory gate is EUR 60 per tonne.

Positive impacts of the project

Among the positive impacts of the project:

- It creates a demand for compost, which can improve soil conditions and ensure food security.
- It complies with national agriculture policy, which considers compost as necessary to improve soils.
- One of the largest marketing companies in Bangladesh has signed a contract to market compost throughout the country.
- Local banks are now interested in investing in similar waste-related projects, a good indicator of the project's success.
- It has demonstrated that, even without support from the government, the private sector can invest in solid waste related projects and harness carbon funding to make it attractive for financial backers.
- The government of Bangladesh, convinced by the project's success, has taken the initiative of replicating the model throughout the country using its own fund and the CDM approach.
- In contrast to the municipal system, the CDM approach promotes transparency and good governance since each step in its process is documented and properly monitored. In this project, for instance, monitoring equipment is installed in the compost plant: it includes an electronic weighbridge to keep a record of incoming waste, a gas meter to gauge oxygen, a thermometer to record temperature, and a moisture meter to record moisture content.

Early challenges

The project faced a number of challenges during its initial stages. First was the anxiety of convincing policy-makers, engineers, and bureaucrats of the benefits of the CDM and the opportunities from carbon trading. It was also a challenge, in the absence of any UNFCCC methodology, to prove that aerobic composting of organic waste reduces methane emissions. It was therefore left to Waste Concern and its Dutch partner to develop a methodology (AM0025) which showed that aerobic

composting does not generate methane gas.

Second, there was as yet no Designated National Authority (DNA) for CDM, which is necessary for project approval. To resolve this, Waste Concern approached the United Nations Development Programme (UNDP) to assist the Ministry of Environment and Forests (MoEF) in setting one up.

Third, it was extremely challenging to get the DCC to sign the concession agreement. Although the project had been approved by the DNA, with the active participation of the DCC, some DCC staff and officials, who had acquired a vested interest in the management of the city's solid waste, openly opposed the project. Prior to the agreement, the municipal waste management system was not transparent or properly documented. There were issues related to 'ghost' labour, false trips, pilfering of gasoline for trucks used in waste collection and other unreported acts of malfeasance. However, under the current agreement, such petty acts of graft and corruption have been eliminated since WWR Bio Fertilizer Bangladesh, Ltd, undertakes the collection and recycling of waste every day without any cost to the DCC.

Fourth, even after the opening of its first compost plant, the project had to wait 12 months to obtain a licence from the government to market compost. This delay, due to a new regulation regarding compost standards and field trials introduced by the Ministry of Agriculture in 2008, meant the project could not initially reach a capacity of 100 tonnes per day.

Fifth, 56 permits and licences were required from different government agencies and departments, causing further unnecessary delay.

Sixth, the government practice of promoting compost but offering no subsidy while providing a subsidy for chemical fertilizers distorts the market. Other obstacles include a 5 year tax holiday for compost projects (a green project), while other green projects, such as wind and



Open-air dump, Santo Domingo, Dominican Republic (18°28' N, 69°53' W). © Yann Arthus-Bertrand / Altitude - Paris

solar, benefit from a 15-year tax holiday. Another market distorting factor is that, while the municipality pays a tipping fee for land filling of waste, the government does not pay a tipping fee for recycling of organic waste in Dhaka. These fiscal policies, instead of providing incentives to invest in organic waste recycling projects, actually discourage potential investors. This issue should be addressed by the national government.

Lessons learned

Using the carbon financing scheme or the Kyoto Protocol's CDM, organic waste commonly generated by towns and cities of developing countries can be converted to compost without any form of investment from the government. The scheme helps overcome technological and financial barriers in waste management and can create new opportunities for green business.

Carbon financing can open a new window of opportunity for poor cities to attract investment in waste management and promote public-private partnership or cooperation. The CDM allows the private

sector to invest in the collection, transportation, and disposal of waste, saving the government considerable overheads and management costs. It gives investors confidence since the project is endorsed by the government and the UNFCCC. Furthermore, it makes a waste-based project attractive to investors because it reduces the payback period.

CDM projects can be pro-poor and, in small- and medium-sized towns, appropriate for small-scale projects. In addition, the CDM provides an opportunity for bundling small-scale compost projects.

However, a 'one-stop' approval process is necessary to reduce, if not eliminate, delay in project implementation and the UNFCCC CDM process has to be simplified for developing countries to make the transaction costs affordable. Moreover, to promote organic waste-based green business, governments should provide fiscal and regulatory incentives, which at present are absent.

There is also a need to raise awareness within government and the private-sector about CDM and carbon-trading activities.

Can the project be replicated?

Yes, the project can be replicated. Currently, 51 replications of this model have been carried out by other groups (Government, NGOs and the private sector) in 30 Bangladeshi towns. The United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) has recently begun promoting Waste Concern's community-based composting model in Matale City in Sri Lanka and Quay Nhon City in Viet Nam, scaled up using carbon trading. Still more recently, a number of South Asian countries (such as India and Pakistan) are adapting the methodology (AM0025) developed by Waste Concern and its Dutch partner.

Recommendations for promotion of such projects

Despite their favourable environmental and social benefits, organic waste management projects have a payback period of at least seven years. It is therefore essential that the government devise a combination of fiscal incentives and market-based instruments to promote private sector investments in them, for example:



Tax holidays. Entrepreneurs setting up a compost plant as part of a joint venture or within the private sector should qualify for a tax holiday of 10 to 12 years and be exempted from customs duty, excise duty, value added tax, sales tax, and other local taxes on equipment, machinery, processing plant, etc.

Capital subsidies. Entrepreneurs should qualify for a capital subsidy of up to 50% of the plant cost (if the municipality owns the plant, for example build-operate-transfer (BOT)), and 30% of plant cost (if owned by the private sector, for example build-operate-own (BOO)). Moreover, for the aspect of the project financed by banks, lower interest rates should be fixed by the government along with a long loan term.

Two financing patterns for administering capital subsidies for setting up compost plants were suggested by the Government of India Inter-Ministerial Task Force on Integrated Plant Nutrient Management using City Compost, including: (i) where a local body owns the compost plant, a 50% grant subsidy, 15% equity (local body), and 35% debt from financial intermediary (FI), or (b) where a joint venture between the ULB and a private company exists, a

30% grant subsidy, 30% equity (15% each partner, including land), and 40% debt from FI.

Tipping fees. A private sector entity operating organic waste recycling facilities such as compost, biogas or RDF plants should not be asked to pay royalties to the municipality. On the contrary, tipping fees should be paid by the municipality for each tonne of waste processed by the entrepreneur since waste recycling reduces land filling costs. The payment of tipping fees to private operators is the norm in Europe and North America.

Concessionary rates for utilities. The entrepreneur should be supplied electricity, diesel, and water at the same rates as provided to the agricultural sector or at a concessionary rate, whichever is less.

Long term lease of land. One of the major barriers for implementation of organic waste processing plants is the lack of the availability of land. Entrepreneurs should be provided land at existing dumpsites on a long term lease, free of cost, for setting up compost, biogas, or RDF plants. The private sector (in the case of BOO) or municipality (in the case of joint venture such as BOT) should be allowed to raise loans

from commercial banks and others by jointly mortgaging the land, if required.

Creating parity with chemical fertilizers – a compost subsidy. Although governments throughout the South Asia region promote compost use, they provide subsidies to chemical fertilizer companies while neglecting to provide subsidies to organic fertilizer/compost manufacturers. The use of compost has multiple environmental and economic benefits, such as reducing GHG emissions and providing a higher yield when used in conjunction with chemical fertilizer. These benefits warrant increased government subsidy. It is recommended that funding for the production of compost should be 5 to 10% of annual subsidy to chemical fertilizer.

Co-marketing of compost with chemical fertilizers. Fertilizer companies can adopt a 'basket approach', which would entail the co-marketing of compost with chemical fertilizers. For larger scale compost plants, the use of fertilizer marketing companies for distribution and sale of compost provides a great advantage. A suggested ratio is four bags of chemical fertilizer with one bag of certified registered compost ◀

About the authors

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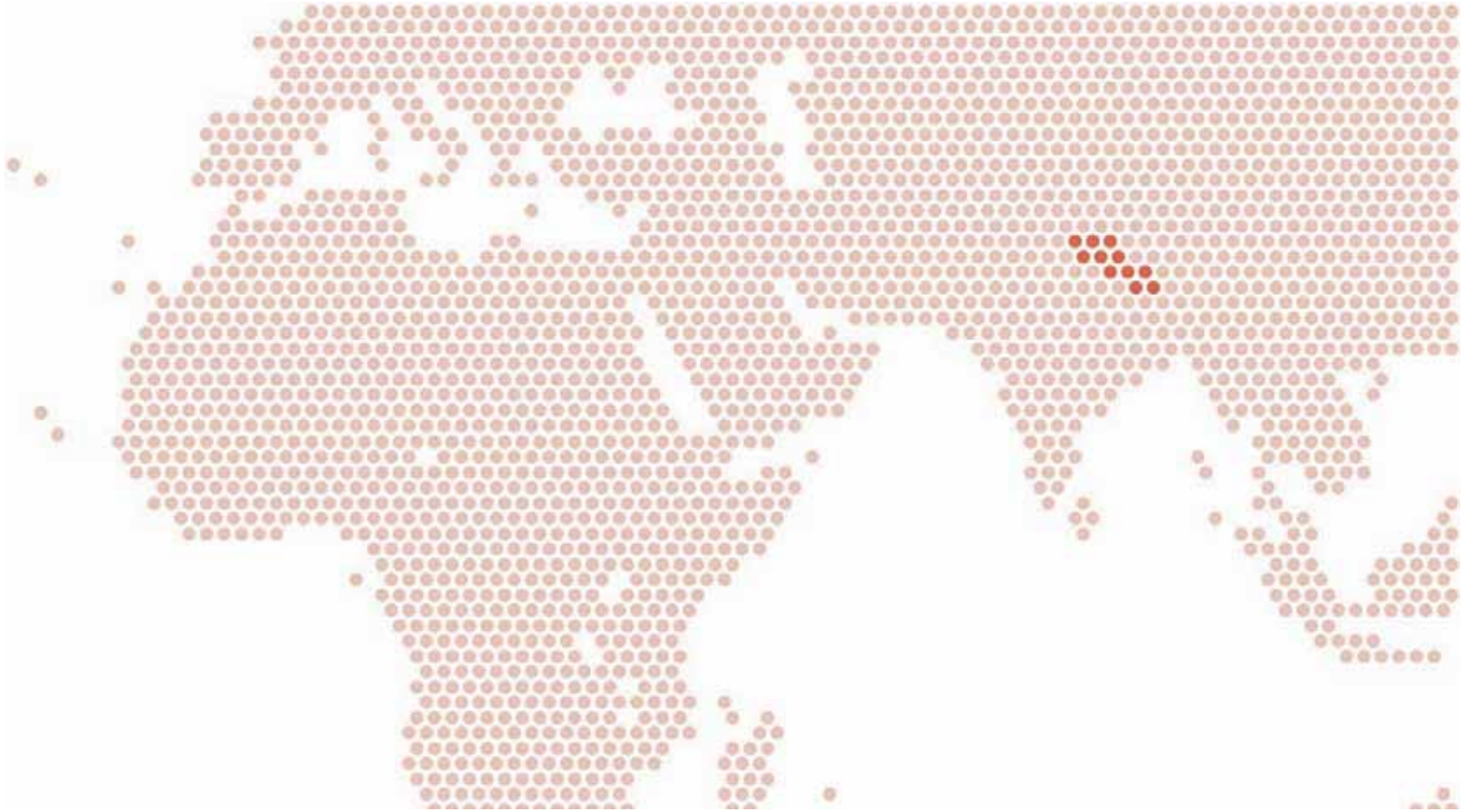
A. H. Md. Maqsood Sinha, an architect-urban planner, co-founder and Executive Director of Waste Concern, has spent more than 24 years working and conducting research in the fields of solid waste management, sustainable development, clean energy and municipal services planning. He is involved in the planning, design and implementation of several waste management and recycling projects in Bangladesh, Sri Lanka and Viet Nam, as well the design and implementation of CDM-based waste management and energy projects.



Nepal

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Green energy for development in Nepal

Semida Silveira, Brijesh Mainali and Dilip Khatiwada

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In their outline of ongoing rural electrification in Nepal, the three authors note that the country is endowed with large amounts of renewable energy resources but still trapped in imports of fossil fuels, a major drain on the national economy. They argue that the ongoing process of rural electrification is progressing well but unevenly and that challenges lie ahead for reaching the poorest communities. The authors call on government agencies and donors to consider strengthening credit opportunities for renewable energy at the local level. They say that market-based rural electrification mechanisms can function well in least developed countries, subject to understanding the peculiarities of the local demand, anchoring efforts on locally available human and natural resources and creating mechanisms of support to improve affordability.

Green energy for sustainable development

Poor countries have a pressing development agenda. Although increased understanding about the role of energy for promoting sustainable development has led to many policies for electrification in developing countries, orchestrating the energy transition from traditional to modern and more efficient energy technologies and services remains a major challenge both nationally and globally. In fact, energy provision to large poor populations can be a difficult and costly proposition with negative environmental impacts unless coupled with strategies to trigger socio-economic development.

How can the green agenda contribute to address this challenge? The green economy is understood as a key element in sustainable development, one that requires addressing whole production, exchange and consumption chains, and transforming them into resource-efficient and environmentally-sound processes over time. This is a major task that stretches from local to global levels of action. On the other hand, promoting sustainable development in the face of major national needs requires activating weak markets and boosting jobs and incomes, often within

a context of precarious institutional set ups, constrained financial resources and stringent global competitiveness. Thus, the promotion of the green economy and sustainable development requires the identification of strong entry points that can satisfy multiple agendas at various scales at the same time.

In other words, actions need to be simultaneously pro-development and pro-environment. There need not be a contradiction between the two as long as local potentials and needs are understood and taken as starting points. Energy provision, for example, can serve both national and global agendas if solutions with low environmental impacts are put into practice to provide energy services for productive activities that can boost local economies. Electrification efforts in Nepal serve to show that markets for renewable energy technologies can, in fact, be created in remote and poor areas. At the same time, bottlenecks constrain the production and use of renewable fuels in the transport or generation of bioelectricity within the context of significant opportunities for ethanol production, agricultural modernisation and local-based electrification solutions. Support from the international community can help address these bottlenecks.

Electricity provision in Nepal

Nepal is among the poorest and least industrialised countries in the world, with nearly one third of the population still living below the country's poverty line. It is a land-locked country with a population of 28.6 million inhabitants. Globally, the country is mostly known due to Mount Everest, the highest mountain peak in the world. Nepal is basically an agrarian country with more than 80% of the population living in rural areas. According to the Asian Development Bank, Nepal has the highest Gini-Coefficient in South Asia (0.47), indicating large income inequalities (ADB, 2011).

Nepal's per capita energy consumption is one of the lowest in the world. A Nepalese citizen consumes 14.28 GJ/year (measured in total primary energy supply), or only 6% of the energy consumed by the average Swedish citizen (IEA, 2010). More than 56% of the total population lacks access to electricity. However, the pace of electrification has increased significantly along with the introduction of specific support programmes and policies. Access to electricity has increased from 15% to 44% in the last 15 years.



Market-oriented policies for renewable-based off-grid technologies have been used as a mechanism to promote rural electrification in Nepal. This has resulted in an expansion of the rural electrification market based on renewable energy (RE) such as micro/mini hydro and solar photovoltaic (PV). Along with increased market size, entrepreneurial forces have been triggered and the number of installation and manufacturing companies, as well as non-governmental organisations (NGOs) working in the RE sector has doubled in the past 10 years. The experience of Nepal shows that it is possible to mobilise private finance and small business under a strong umbrella of public coordination to create markets for renewable energy even in poor remote areas of developing countries (Mainali, 2011).

RE-based off-grid electrification in Nepal builds upon the country's high availability of natural resources. The definition of rural energy subsidies and delivery mechanisms, the periodic revision of subsidy policies (revision 2000, revision 2006 and recent revision 2009), the rural energy policy 2006, and the exemption of import tax and value added taxes (VAT) on RE equipment have been instrumental in the development of RE-markets. Subsidies have served to channel demand towards solar home systems and micro-hydro solutions by making them more affordable to villagers. There has also been an increase in the local equity share invested in renewables over time. Thus remittances from Nepalese expatriates seem to be playing an important role in the electrification process. However, remittance flows are intertwined with the global economy and, as such, could be reduced in the face of financial downturns, constraining the pace of rural electrification. In this context, the limited availability and access to affordable credit for electrification remains a major challenge (Mainali and Silveira, 2011).

Distributional analysis of rural electrification in Nepal has shown that, after the

introduction of solar PV in 1991, electrification coverage has grown significantly. Analysis has shown that off-grid rural electrification in general, and solar home systems in particular, helped overcome some of the economic constraints of extending transmission lines, thus speeding up the electrification process. However, analysis has also revealed that only parts of the population have been supplied, the technology distribution is uneven, and real challenges remain ahead if the poorest are to be reached. Therefore, in the long run, government agencies and donors should consider strengthening the credit opportunities for renewable energy at the local level. In addition, a decentralised and more efficient subsidy delivery could better spread the benefits of subsidies, ultimately helping intensify the electrification process.

The institutional and regulatory frameworks supporting the formation of RE-markets are evolving, and the peculiarities of the market are increasingly understood by policy makers and market players operating in rural areas. Adjustments are needed with the purpose of intensifying the electrification process and alleviating poverty throughout the country. Our studies have shown that the market-based rural electrification mechanism can function well in least developed countries. For that, it is necessary to understand the peculiarities of the local demand, and to anchor efforts on locally available resources, both natural and human capital, as well as to create mechanisms of support to improve affordability.

Renewable transport fuels and bioelectricity – an untapped opportunity in Nepal

Commercial energy amounts to only 12% of the total energy consumed in Nepal, and consists of fossil fuels (i.e. petroleum and coal) and grid connected electricity, especially from large hydropower plants. The other 88% consists of traditional energy sources, basically biomass. The contribution of electricity in the primary energy share is only 1.8%. Although the use of modern renewables (i.e. biogas, micro-hydro, and solar) increased approximately three-fold between 1999 and 2009, it has a negligible share in the total consumption (less than 1%). Nepal does not have fossil

fuel reserves. Therefore, petroleum and coal are imported, placing a huge burden on the national economy. The government has refrained from passing the full costs of oil imports to the users due to potential political unrest.

A major untapped opportunity remains that can help Nepal address energy security and costs in transport as well as intensify the electrification process with bioelectricity. The transport sector is the largest consumer of petroleum products. Two major renewable fuel options are at hand to improve the energy base of the transport sector: one is based on the huge potential to generate electricity from hydropower; the other is based on bioethanol from molasses.

Battery-operated electric vehicles (3-wheeler) are already in use in the Kathmandu Valley and can continue playing an important role if electricity generation capacity expands and is used to charge batteries. Nepal is one of the countries with the highest hydroelectricity potential per capita in the world. Yet the expansion of installed capacity of hydroelectricity has progressed at a very slow pace. Nepal has added only 507 MW hydropower capacity to its matrix (from public finance) since the 1950s against a development target of 3785 MW (i.e. 13.4% of the target). Electricity demand is increasing at an average rate of 10% per year and Nepal produces less than half of its needs in the dry season when not enough water is available for electricity generation. As a result, the country is at present facing a huge crisis of electricity supply.

The second option is related to the immediate potential that exists in Nepal to produce ethanol from molasses to offset the use of gasoline. Nepal produced 2.6 million tonnes of sugarcane in 2006/07 using 64 thousand hectares of land. Approximately 70% of the total sugarcane produced in the country is used in sugar manufacturing, thus 1.8 million tonnes of sugarcane are presently available for sugar mills. With that, Nepal can immediately produce 18 million litres of bioethanol annually. The production would be based on molasses, a bi-product, thus not compromising the production of food products (i.e. sugar and traditional sweeteners).

The Government of Nepal has already decided, in principle, to blend 10% ethanol in petrol. Yet, this has not been implemented due to technical, economic and institutional problems. Kathmandu Valley consumes 70% of the gasoline imported to Nepal, or 71,338 m³ annually. Most light vehicles (cars, jeeps and vans) use gasoline and a huge fleet of two-wheeler motor-bikes also consume gasoline. Using E20 in the Kathmandu Valley, Nepal can save 4,860 m³ of gasoline per year, which equates to a reduction of 6.8 % in gasoline imports and significant savings for the country. As much as 14% of import reduction is possible if vehicles go for E20. The use of E20 in the Kathmandu Valley would equate to direct savings of USD 10 million (Silveira and Khatiwada, 2010). The introduction of E20 can contribute towards avoiding 23,397 tonnes of CO₂ emissions, which is 14% of the total annual emissions from gasoline (2006/07).

Exploring synergies to provide energy and promote sustainable development

The agricultural sector employs 74 % of the labour force in Nepal (CBS, 2008). The increase in sugarcane production observed in the last decades was mainly the result of expansion of planted area, while improvement in yields was only marginal. The average cane yield in Nepal is only 40.6 tonnes per hectare. In comparison, sugarcane yields in India reached an average of 68.2 tonnes/ha in 2001/02. In Brazil, sugarcane productivity is steadily increasing and yields already surpassed 80 tonnes/ha in 2004. There is potential to increase yields significantly in Nepal, subject to innovation practices which are well-known and proven in agriculture.

In recent studies, we have developed the entire life cycle analysis for the estimation of energy and greenhouse gas (GHG) balances of sugarcane-based bioethanol in Nepal: energy (fossil and renewables) and material flows inventory from sugarcane farming (human labour, irrigation, and fertilizers/chemicals), transportation, sugar cane milling, fermentation, distillation and dehydration and treatment of wastewater have been analysed for the production of anhydrous ethanol (Khatiwada and Silveira, 2009 and 2011). Bagasse as a source of renewable energy is used to

generate heat and electricity required for sugarcane milling, distillation and dehydration processes.

Molasses is converted into anhydrous ethanol fuel (EtOH). Distillery waste water effluent is treated prior to disposal, generating biogas which is later fed as fuel into the boilers. Overall, analysis indicates that the production and use of bioethanol as transport fuel reduces life cycle GHG emissions compared to conventional gasoline. In addition, analysis shows that significant improvements can be achieved in the total energy balance of bioethanol production if modern technology processes are properly applied and better synergies for multiple services are implemented.

At present, sugar industries in Nepal are self-sufficient in energy requirements. However, excess bagasse can be used to provide surplus electricity to replace diesel-powered electricity to local industries. With more efficient use of bagasse and cane trash, surplus bioelectricity can be generated also to promote electrification in the country. The evaluation of one sugar mill in Nepal showed that 17% excess bagasse is available at present, after internal energy requirements are met (Khatiwada and Silveira, 2009). Improvements based on readily available knowledge and technologies can further enhance the energy exchange and gains of the land and biomass resources available in Nepal. Overall, there is a large potential for improvements along the sugar-ethanol production chain

including: **(a)** modernisation of agricultural practices and improvement of cane yields; **(b)** efficient use of cane bagasse and trash to generate bioelectricity; and **(c)** upgrading and optimisation of industrial operations.

Another important synergy that can be achieved with the use of bioelectricity is related to the possible complementarity with hydropower. Most hydropower plants in Nepal are of the run-of-the-river type. This means that they are subject to seasonal river flows, and cannot provide electricity in their full capacity in the dry season. Nepal can hardly afford to run thermal plants with imported fossil fuels. In any case, this would not be a sustainable alternative. Lack of proper infrastructure is the cause of frequent power shortages and blackouts which are detrimental to the development of the country. Financial resources are needed to plan and develop the necessary infrastructure and better utilise the country's hydroelectric and biomass potential.

Installation of high pressure boilers and turbines in sugar mills, replacing inefficient low pressure turbines, would open opportunities to supply additional electricity to the grid. Since the dry season and the period of operation of the sugar mills coincide, the complementarity of the two sources is evident. For instance, 313 GWh of surplus electricity could have been sold to the grid in 2006/07 (Khatiwada et al., 2011). Instead, 329 GWh were imported from India in the same year (NEA, 2010).





This means that bioelectricity could cover about 35% of the total electricity demand during the sugarcane crushing period (dry season or 150 days between December and May), equivalent to 95% of the electricity imports from India. With demand for electricity increasing rapidly, it is important to make sure that sustainable alternatives are chosen as new investments are made to expand capacity. Proven technologies based on abundant natural resources available in the country are low-risk attractive options.

Matching local and global agendas

Nepal is a country endowed with large amounts of renewable energy resources, providing a significant opportunity to develop a sustainable energy system. Unfortunately, the country is still trapped in imports of fossil fuels. Fossil fuel costs have become a major drain on the national economy, compromising political stability and development. Consequently, immediate societal and environmental gains can be achieved by using renewable alternatives to provide energy services and build a solid basis for a green economy in the country.

By using natural resources wisely, with technologies that are readily available,

Nepal can pursue development while also shifting its economy towards more environmentally sound paths and contributing to the global green agenda. For developing countries, finding alternatives based on local resources means not only the opportunity to increase energy security but also to develop local economies and improve the trade balance. From regional and national solutions, there will also be opportunities for expanding towards global solutions as green international markets expand.

Many opportunities for sustainable solutions to meet energy needs exist in Nepal. Biomass, solar and hydropower can all contribute in different ways to meet energy requirements, while also triggering modernisation in agriculture and industrialisation, and increasing energy security. There is no contradiction between the energy options that are attractive to the country and the goals of developing a global green economy from the energy point of view. In addition, recent experiences in the country indicate that poverty can be reduced through the formation of markets for green technologies for electrification.

One of the Millennium Development Goals is to develop a global partnership for development. The role of donors is key in this context, for example, helping

developing nations focus on renewable solutions, bridging financial constraints, facilitating institutional development and improving technology affordability. Nepal and other LDCs are largely dependent on development aid, so it is important to sensitise donors about the potential that these countries have and the specific context in which technologies are to be deployed.

Awareness about RE-technologies and willingness of people to invest and pay for electricity has increased significantly in the past years. However, there is still a huge financial gap between the cost of electrification and its affordability to the poor. Bridging this gap is a crucial issue that needs to be addressed for the smooth expansion of rural electrification. In addition, access to electricity in itself is not sufficient to bring about rural economic growth – a supportive environment for productive activities is also needed. This is better achieved by exploring synergies between energy and other productive activities.

By exploring its bioethanol potential, Nepal can address multiple problems to improve energy security and reduce reliance on imported fuels, control local and global environmental impacts, while also triggering the modernisation of agriculture and improving the total efficiency of its energy

system. Residues from the sugar-ethanol industry can serve to further promote electrification in the country. Favourable governmental policies, proper institutional mechanisms and coordination amongst concerned stakeholders, including private and public sectors, are required to guarantee a sustainable energy path. Both the political and institutional concerns have become the most urgent issues to address at this stage when mature conversion technologies are already available and accessible.

Conclusions

Not only are the poor outside food markets but many have limited access to basic services such as education, health and energy. Properly applied to the benefit of development, the environmental and green economy agendas can make clear contributions to employment generation

and the formation of markets for green technologies. Examples can be found in the energy sector. By exploring the potential for biofuel production that exists in many developing countries today, significant fuel substitution can be accomplished in the transport sector while also creating conditions for increased electricity generation.

Energy access can play a role and become a vector to promote sustainable development in developing countries while contributing to the shift towards a global green and low carbon economy. The story of Nepal illustrates that well. The story is similar in many other poor countries in Africa and Asia that are dependent on oil imports. Agriculture needs modernisation, not least to produce more food; industries wait for a dynamic push of markets; and large populations need jobs, income, electricity and transport fuels.

Many LDCs are strongly dependent on development assistance to reform institutions, make infrastructure investments and support the generation of markets. Donors often operate through projects and are increasingly emphasising global agendas. By strengthening the multiple objectives of projects and the links with local and national contexts, better momentum can be achieved. Planning for social, economic, spatial and environmental balance simultaneously is crucial for correcting distorted processes of regional degradation and turning them into processes of sustainable development. Turning the energy sector green and increasing energy access are essential steps in these processes. Clean energy provision is a central element of the green economy, which needs to be simultaneously pursued nationally and globally ◀

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Going green: history and social implications

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Environment and development on the eve of Rio+20 / Stockholm+40: continuity of policy themes and controversies

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Branislav Gosovic highlights some of the benchmarks in the initial phases of environment-development debate, from the early beginnings at the time of the 1972 Stockholm Conference on the Human Environment and its immediate aftermath, when the stage was set and issues defined for continuing North-South controversies that have lasted to the present day. He notes the emergence of a neo-liberal globalization paradigm in the early 1980s, reinforced during the 1990s, which, he says, undermined the already difficult objective to evolve an integrated approach to global environment/development challenges. Given past history and inertia of existing structures, Gosovic wonders whether the Rio 2012 Conference will be followed by another déjà vu period. He considers, however, that global context is changing, the dominant paradigm is being doubted, a rising South is on the world scene, and the climate change complex of issues is forcing on the international community, willy-nilly, an integrated approach to the global challenges of sustainable development. Rio+20 could thus, one would like to hope, turn out to be a watershed and the beginning of a more promising era of international cooperation.

INTRODUCTION



The Launch of the Spanish edition of the South Commission's report "The Challenge to the South", Havana, August 1990. From left to right, Branislav Gosovic, member of the South Commission secretariat, Manmohan Singh, Secretary-General and member of the South Commission, Julius K. Nyerere, Chairman of the South Commission, Fidel Castro, and Carlos Fortin, member of the South Commission secretariat

The year 2012 will witness the next, fourth in a series of major United Nations conferences devoted to interrelated problems and global challenges successively referred to as environment, human environment, environment and development, sustainable development, and most recently the green economy.

For those who, since the beginning, have been involved in or followed the related debates and negotiations in the international arena, most of the issues and controversies likely to arise remain basically unchanged and are rooted in the structural traits that characterize the global system. Because the institutional and collective memory is weak, it is worth recalling some of the early events and actions, and to illustrate continuity of themes and issues. This is the aim of this analytical aperçu, which could be of special interest to those belonging to the younger generation engaged in ongoing multilateral processes and who may not be familiar with the earlier phases of this continuing saga.

After 40 years, multilateral efforts in the UN to deal with inherently difficult global environment problématique continue to be unfavourably affected by the same underlying

issues. These were manifest from the very beginning, in the late 1960s, when the attention of the international community was first drawn to environment-related problems:

- ☞ North-South differences and conflicts, and gaps in levels of development;
- ☞ The fact that the environment-development nexus questions the social, economic and material sustainability of the dominant structures, and challenges the paradigm that the world system is based on, and is thus subversive and disturbing to the status quo;
- ☞ The inadequacy or inappropriateness of existing, traditional socio-economic constructs, methodologies and institutions to deal with many of the sustainable development challenges, especially those of longer-term significance, common welfare implications and planetary dimensions;
- ☞ The financial cost of the policies and actions that are required – in a situation of competing interests and priorities, chronic scarcity of resources, recurring economic crises, and controversies related to respective responsibilities and burden sharing between states, often at widely differing levels of development.

Recalling landmarks of the first decade

1968 – decision to convene a UN conference on the human environment. The UN decision to convene a conference on the environment was viewed with reserve by many in the South. At that time seen narrowly as the problem of pollution and conservation, it was considered by them as a domain of primary, if not exclusive interest to the already industrialized nations. The developing countries worried that the new issue would cause a reduction in development assistance flows, add to the cost of transfer of technology, and give rise to non-tariff trade barriers erected to respond to environmental concerns. Some resented nature conservation efforts as interfering with their national development, while many opined that Malthusian, natural resource depletion and limits to growth arguments and debates in the North implied barriers to their development, industrialization and economic growth.

As the preparatory process progressed, developing countries' reticence increased vis-à-vis the Conference which, at the same time, was embraced enthusiastically by the North. Many among them even talked about not attending. In order to reduce growing tensions and allay suspicions, the secretariat of the Conference decided to convene an expert seminar on relationships between environment and development. The aim was to arrive at a broader definition of "human environment" by linking organically environment and development. As well, the objective was to identify those aspects which would be of particular interest to developing countries and correspond more closely to their development situations and needs.

1971 – Founex seminar on environment and development. The Founex gathering broadened definitions of environment beyond their initial formulations by highlighting those environmental problems caused by underdevelopment and poverty which to be dealt with and resolved required economic growth and higher levels of development. In this manner it affirmed the link between environment and development agendas; thereafter reference to environment and development or environment-development became common.

The developing countries were pleased with twinning of the two agendas and with the

broadening of the definition of environment to include many problems specific to their situations. They were now more at ease about attending the Conference.

The Founex seminar report brought to surface the underlying contradictions and dilemmas, which in the later years played a major role in North-South disagreements, making effective global environmental action even more difficult to mount. It referred in particular to the self-evident conclusion that environmental problems could not be dealt with in isolation and without addressing their causes, or by resorting to "end of the pipe" solutions and technological fixes, but required comprehensive advances in the development process itself. This in turn implied the need to address and deal with the whole international development agenda.



Secretary-General of the UN Conference on the Human Environment, Maurice F. Strong (right), shows UN Secretary-General U Thant a design for the official Conference poster. Ambassador Keith Johnson (Jamaica), Chairman of the Preparatory Committee for the Conference is at the left. 15 September 1971

1972 – UN Stockholm Conference on the Human Environment (UNCHE). The intrusion of development and of developing countries' views and concerns had a significant impact on the nature of the UNCHE and broadened the scope of its agenda. The Conference represented the first opportunity at the intergovernmental level to bring the international development and environment agendas closer together. By imposing a comprehensive perspective on the many and varied aspects of the environmental problématique, including as it presents itself at different levels of development and in different settings, the Stockholm Conference effectively laid the foundations for an integrated, holistic approach to be pursued in the period that followed.

Difficult negotiations took place, with developing countries – energized by China which

had just joined the United Nations – trying to shore up the international development agenda from being undermined by the North's new preoccupation with environment and pollution issues. This was achieved by recalling some basic principles in the UNCHE Declaration, as well as by approving a number of specific recommendations in the Plan of Action. These included the concept of "additionality", which called for financial resource support for environment-related actions in developing countries to be "additional" to standard official development assistance (ODA). As well, the Conference recommended that the transfer of appropriate and environmentally sound technologies to developing countries should be made on easy and favourable terms. An innovative recommendation was adopted calling for a study of global taxation measures, as a new source of funding for international action on environment.

It appeared that the Conference had succeeded in offering to developing countries sufficient encouragement and grounds to become engaged from the very start in the international quest to protect the human environment and to manage Planet Earth and its finite and fragile resources. These countries expected that the international community would agree to revive and act on the largely stalled international development agenda, and in this manner support their national development efforts, which in turn would make it easier for them to address those environmental problems related to poverty and underdevelopment. They were also looking forward to additional financial assistance, and transfer by the North, on favourable terms, of experience, advanced knowledge and technologies, inter alia to help them deal with those environmental problems that arise through economic growth and modernization of society and economy.

The Stockholm Conference thus ended on a positive note and with high expectations. However, unseen and behind the scenes, as was revealed some 30 years later in papers declassified by the United Kingdom government, the so-called "Brussels Group", a handful of developed countries (but without the host Sweden and other Scandinavian countries, and Canada), was meeting to discuss "damage limitation" from the outcomes of the Conference. With its significantly broader scope and the link with the development agenda, the Conference represented

a “different ball game” and had veered off the desirable course as far as key developed countries were concerned.

1972 – UN General Assembly’s decision to move UNEP Headquarters to Nairobi.

The UN General Assembly decision to locate the headquarters of the new organization in Nairobi, Kenya was taken in autumn of 1972, shortly after the Stockholm Conference. It exposed the underlying tensions and differences between developed and developing countries.

The Group of 77 had for some time been pressing for the headquarters of a major UN organization to be located somewhere in the South. With Kenya playing a leading role and offering an impressive new conference centre to house the UN Environment Programme (UNEP), the developing countries, relying on their voting majority, succeeded in securing the establishment in Nairobi of the new organization to work on implementing the decisions of the Stockholm Conference.

One of G77 political objectives of locating UNEP in the Third World milieu was to expose and sensitize the new organization to conditions in the South, and to make it more responsive to the development side of the environment-development nexus. Indeed, the developing countries feared that were UNEP to have its headquarters in the North, it was likely to fall under the strong influence of developed countries’ governments and its many energetic and enthusiastic NGOs, and that their perceptions and priorities would relegate development-related concerns to sidelines.

Going along with the decision reluctantly, the developed countries were unhappy and were taken aback. They also argued that the peripheral location in Nairobi, in addition to logistical difficulties, would hamper UNEP in fulfilling its system-wide coordinating role, its institutional model having been designed on the assumption that it would be “centrally-located”, i.e. in Geneva.

In the period that followed, the location of UNEP gave rise to a number of developed countries’ initiatives aimed to correct this “shortcoming”, including the still pending proposal to create a comprehensive world environment organization. It also contributed to fragmentation of efforts, and the establishment of spin-off mechanisms,



UN Photo/Yutaka Nagata



Official Emblem for the
UN Conference on the Human Environment

Environment Conference Meets at Stockholm
Carlos Calero Rodrigues (left) of Brazil, Chairman of the Third Committee, conversing with
A.M.A. Hassan (Sudan), Rapporteur.
13 June 1972

such as the UN Commission on Sustainable Development and the various conventions, located in the North. Yet, logically, these should have been physically under one roof, given the organic interrelationship of issues under consideration.

1973 – First Governing Council and the rise of Group of 77 in UNEP. The first session of UNEP’s Governing Council represented another landmark in this start-up phase. Held in Geneva, before the UNEP secretariat had moved formally to Nairobi, this opening session of the Council was marked by the re-emergence of North-South policy differences and by the Group of 77 becoming active in the fold of the new organization. The appearance of the Group of 77 displeased the countries of the North. They argued that the group system of negotiations characteristic of UNCTAD was inappropriate and should not be replicated in the new environment organization.

However, prior to the activation of the G77 which took place only towards the closing stages of the first Council and as long as the developing countries spoke individually and without a coordinated group position, their views appeared to have little influence on the proceedings. At the same time, the developed countries acted as a group and coordinated their position, and had a clear idea what they wanted to achieve with regard to programme priorities and the allocation of financial resources from the Environment Fund.

The appearance of the G77 helped shift the focus away from Earthwatch, environmental assessment and management to development-related concerns. Thus, human settlements emerged as the number one priority in allocating available financial resources.

This reordering of programme priorities was yet another early episode that contributed to disenchantment of the developed countries with the fledgling organization and the direction it was taking under the influence of a pro-active South. What was shaping up did not quite correspond to their expectations, with developing countries affecting the course and character of the new institution by taking initiative at critical junctures early in the follow-up process. They were not pleased with the importation of “extra-neous” international development agenda issues into the nascent work programme and the resulting “dilution” of what they felt should have been the priority concerns.

1974 – New International Economic Order and the Cocoyoc Symposium. While UNEP was settling into its new home in the Kenyatta Conference Centre in Nairobi, where the secretariat moved in mid-1973, important events were taking place on the global scene. They included the OPEC action to increase the price of oil, and the Algiers Summit of the Non-Aligned Movement (NAM) which called for the establishment of a new international economic order and for national sovereignty over natural resources.

The energy and economic crisis triggered by the oil price rise led to the convening of the 6th Special Session of the UN General Assembly in the spring of 1974, to consider its implications for the world economy and for individual countries. This opportunity was seized by NAM to present its New International Economic Order (NIEO) proposal. The G77 and NAM were attempting to advance the implementation of the international development agenda by linking it with measures to deal with the energy crisis. Encouraged by the OPEC actions, they were trying to move forward on a broader front of what effectively were interrelated development issues. Similarly, developing countries' expected that outcomes of UNCHE would serve as an additional impulse for action on the international development agenda. They considered that their own readiness to engage and cooperate on environment matters which were dear to developed countries was effectively a quid pro quo of a kind which would elicit North's more cooperative stance regarding their development demands.

UNEP waded into the generalized hiatus surrounding OPEC, NIEO, the Charter of Economic and Social Rights and Duties, and the newly topical concerns of high energy cost, oil scarcity and exhaustion, and management and national sovereignty over natural resources. This occurred when, with the support of the Dag Hammarskjöld Foundation, it organized a joint UNEP/UNCTAD Symposium on "Environment, Development and Patterns of Natural Resources Use" in the autumn of 1974. The symposium, chaired by Barbara Ward, was held in Cocoyoc, Mexico.

The Cocoyoc Declaration that was adopted ranged broadly over the global economic, social and political agendas, and the interrelationships of issues concerning North-South relations, environment, development, natural resources use, and population. It pulled a number of threads together, questioned the ability of the free market to resolve the environment-development challenges and issues, and highlighted the need for changing patterns of production and consumption, and hence lifestyles. The Declaration was an attempt to contribute to the evolution of a comprehensive framework to deal with the many interrelated issues in the post-UNCHE period, issues which were normally dealt with in a sectoral way by different international organizations. It also

reflected the rising voice and newly found self-confidence of the South in the wake of OPEC action and the NAM/G77 NIEO initiative. However, the Declaration was perhaps politically too audacious and explicit, given the prevailing sensitivities and outlook of key developed countries, for example, in its questioning the market and trickle-down theories or in speaking of maldevelopment and exploitation.

It is no wonder, then, that the UNEP secretariat as the major driving force and responsible for the symposium, would be called to order. Indeed, only a few days after the Cocoyoc meeting had ended, it received a telex signed by the then United States Secretary of State Henry Kissinger. The telex objected to the political tone of the Declaration, and its underlying premise that "everything is related to everything else" which made it possible to lump together what were distinct issues. It pointed out that UNEP's mandate is limited to environmental concerns. And it argued that many of the issues raised in the Declaration were not *stricto sensu* environmental and belonged to other domains of the international agenda and thus to other international bodies mandated to consider and deal with them.

The underlying message was emphasized soon thereafter when the US announced that it planned to withhold its voluntary contribution to the UNEP Environment Fund. Given that the US share amounted to 40% of the total in the Fund, the implementation of the environment programme which was dependent on these resources was in jeopardy. This sign of displeasure illustrated the vulnerability of UNEP and announced the shrinking of policy space that would be available to the secretariat and to the organization itself.

This episode marked the beginning of what became common practice by developed countries of exercising unilaterally policy control by using their financial contributions. And it was an explicit statement of an overarching policy that rejects comprehensive, holistic treatment of the environment/development nexus and issue linkage in the wide-ranging North-South agenda.

The Legacy of the 1970s. As noted above, the meeting of the Brussels group of developed countries at the time of UNCHE marked the beginning of efforts by the North to

counter what these countries consider as unwarranted intrusion of developmental concerns and broader political preoccupations into the sphere of environment.

The period following the NIEO and the Cocoyoc Declaration, in part triggered by these two events, witnessed the gradual emergence of a North strategy of generalized containment of the UN and of the South as concerns environment and development. Its principal elements, deduced by observing the actions of developed countries, can be summed up as follows:

- ✎ Exercising broad control over the international environmental agenda to forestall or neutralize undesirable developments and "excesses";
- ✎ Maintaining initiative, while keeping developing countries off-balance, and encouraging divisions between them;
- ✎ Discouraging issue linkage and consideration of underlying socio-economic causes, while giving preference to case-by-case, technological or methodological/management approaches to single issues;
- ✎ Objecting to demands that development-related measures in international economic relations be relied on to foster environmentally sound development.

Yet, the very character of environmental issues and how they were initially formulated at the Stockholm Conference had already allowed "the genie to escape out of the bottle". It made it possible in the global forum of the UN to take an in-depth and incisive look at the nature of human society, thus opening the way to question, however timidly, the dominant economic and political paradigm and the overarching world system.

The issues that emerged from the early conceptual and policy efforts and framework depicted above have been present ever since in intergovernmental debates and negotiations. They have influenced various attempts to formulate or reformulate these challenges to find solutions which would command a broad consensus of the South and the North.

Given the potential of these issues to trouble the dominant order, the establishments in the countries of the North pursued a policy of blocking or simply ignoring unwanted initiatives of the South, while increasingly

placing developing countries on a defensive, including by projecting an image of their responsibility for specific environmental problems.

Thus already by the mid 1970s, the tone was set for the future official responses of the North to the environment problématique. The pattern has largely held in the years that followed; it is responsible to a significant degree for continuing North-South tensions, for conflictive issues that occur in discussions, debates and negotiations, including today on climate change, biodiversity and the green economy, and for the frustration developing countries often experience when environment-related matters are considered in multilateral forums.

Some highlights of the second decade

1980 – World Conservation Strategy. The IUCN/UNEP/WWF World Conservation Strategy should be mentioned because this was the first time that the now current concept of “sustainable development” made its appearance in an international document, albeit in the context of managing the renewable resources of the biosphere.

1981 – The Cancun North-South Summit. The Cancun summit of world leaders was convened in 1981 to consider the recommendations of the report of the North-South Commission chaired by Willy Brandt. The aim was also to give impulse from the highest level for their implementation, particularly since the ongoing intergovernmental negotiations concerning the international development agenda were largely stalled.

However, instead of resulting in progress, the Cancun Summit negated decades of effort and negotiation. The leaders of the two most powerful developed countries declared their lack of interest in continued engagement. They argued that the whole international development agenda and related intergovernmental efforts represented a flawed approach to development challenges, as did planning and regulation. Instead, they proposed that for attainment of development objectives one should rely on the private sector, unleash individual initiative, and supplant the role of the state in the economy by the mechanisms of the free market.



Heads of State at the Cancun Economic Summit of 1981 in Mexico
23 October 1981

This was a significant turning point. It effectively marked the end of North-South development dialogue, and signaled the coming disengagement of the North from earlier commitments and agreements. It announced the rise of the neo-liberal policy outlook and the beginning of a globalization process anchored in what came to be known as the “Washington Consensus”.

Unavoidably, this had an impact on the environment agenda and also removed a basic building bloc of a possible North-South compromise that was implicit in the outcomes of the Stockholm Conference. The earlier linkage of more narrowly environmental concerns with the broader international development agenda, already tenuous, was thus weakened further. Given the increasing likelihood that this agenda would not be implemented, the developmental side of the environment-development equation was bound to be negatively affected. And, in view of the ascendance of the new market-based neo-liberal paradigm, a number of measures of support sought by the South from the international community through intergovernmental action were no longer admissible and could not be counted on.

This fundamental policy shift, however, was not abrupt and the earlier practices and processes, as well as illusions, continued well into the 1990s.

1987 – World Commission on Environment and Development. Thus, the existing momentum maintained the debate along well-traced tracks. North-South differences of position and outlook surfaced in the independent World Commission on Environment and Development (WCED), chaired by Gro Harlem Brundtland. Having met during the period 1985-87, it produced its acclaimed report “Our Common Future”. The Commission laboured under a cloud of disagreement among its members, as well as secretariat staff, from the North and the South, who could not find common language regarding the linkages between environment and development. In particular, they argued concerning the role of international economic relations and of the external economic environment in enabling, or in hampering the developing countries both in their development, and in their ability to respond to the requirements of the environment-development agenda. They disagreed even more over the specific responsibilities of the North, both as concerns global environmental problems and support that the developed countries would extend to the developing countries.

While intense, these disagreements were eventually smoothed over and the Commission completed its work. Compromise was found in the concept of “sustainable development”, to which everybody could subscribe. It was appealing, sufficiently vague and had multiple possible meanings.



A general view of world leaders meeting during the Summit Segment
03 June 1992
Rio de Janeiro, Brazil

1992 – UN Rio Conference on Environment and Development (UNCED). The notion of “sustainable development” which was launched by the WCED, soon became the new, mobilizing motto, a programmatic concept, a synthesis of environment and development concerns. The 1992 UN Conference on Environment and Development (UNCED), held in Rio 20 years after the Stockholm Conference, embraced it and made it into one of its key policy recommendations.

The Rio Conference represented the last stage of this initial period, defined by the Founex, UNCHE, NIEO and Cocoyoc events. It resulted in Agenda 21, and the biodiversity and climate conventions. The Group of 77 argued forcefully for the linkage of the environment and development agendas. In particular, it pressed for additionality principle and obtained the establishment of the Global Environmental Facility (GEF), as a means of securing some of the much-needed additional financing.

Significantly, the G77 secured the acceptance of the principle of “common but differentiated responsibilities”. It implied, at least as the developing countries saw it, that since the developed countries were primarily responsible for many of global environmental problems, had incurred an environmental debt vis-à-vis the South and the planet as a whole, and were highly advanced and rich, they should assume corresponding responsibilities for global action and bear a major share of the costs involved.

Post-1992 age: The rise of the neoliberal globalization

During the period when the Rio Conference took place, seismic processes were already under way, which were to change radically the world geopolitical context and result in a unipolar system wholly dominated by the North. The developed countries no longer felt under pressure or obliged to engage seriously with the South and respond to its traditional demands contained in the international development agenda. They ignored, inter alia, developing countries’ concerns over trade barriers and conditionalities arising from environment issues, their calls for additionality in development assistance and for transfer of appropriate technologies on favourable terms, and their efforts to revive the North-South development dialogue.

Developed countries were not keen to accept the idea that intergovernmental action was needed to correct and guide, indeed regulate the market and the international economy, in order to accommodate development goals and needs. Also, facing growing agitation and pressure from their own NGOs and environmentalists on one hand, and from the corporate sector on the other hand, and eager to minimize the disruption and costs they would incur due to environmental policies, the developed countries pursued a 2-pronged international strategy:

- a. To focus attention increasingly on the responsibilities of developing countries and to present them as the cause of given environmental problems;
- b. To promote the market as the more effective means of avoiding the difficult choices presented by other approaches to environmental problems. The market would thus substitute for national and international measures and regulation, while the profit motive would be enlisted as the principal vehicle in the efforts to attain elusive environmental goals. The concept of carbon-trading and carbon sinks, thus emerged as the preferred approach to global climate change. It embodied the “market environmentalism” paradigm and was used as the cornerstone in negotiating the Kyoto Protocol.

In the newly established WTO, what was perceived by many in the developing countries as environment-related trade barriers and “green” protectionism of the North, signaled the coming of the new age. Developing countries were subjected to trade conditionalities in support of specific environmental objectives. It was also a convenient way for some developed countries to please their own environmental NGOs which were clamouring for action, while, when possible or required, also to use these conditionalities as a non-tariff trade barrier.

In WTO, as well, the new trade-related intellectual property regime, embodied in the TRIPS agreement, effectively undermined the UNCHE recommendation and the long-standing demand of developing countries for transfer of appropriate and environmentally sound technologies on favourable and easy terms.

Importantly, the principle of the “level playing fields”, which is at the very foundation of WTO and the agreements it embodies, put an end to the hard-won principle of “special and differential treatment” for developing countries. It marked the dawn of the new age of “equality” among unequal players, in what were decidedly un-level playing fields.

These developments, in which WTO played a key role, had a negative policy and practical impact on the next iteration of the earlier environment-development conceptual framework, which following UNCED was referred to as the “sustainable development” agenda.

In sum, as a consequence of a policy and paradigmatic shift, driven by the changing outlook and preferences in key countries of the North, a weakening and marginalization of the collective South, and disjoining of the issues in the UN system on a sectoral basis, one witnessed a significant departure in practice from the original premises laid out at the time of the Stockholm Conference, even though these were broadly reaffirmed in the documents adopted by the global conferences in Rio and Johannesburg which followed.

The developed countries were successful in turning the tables on the developing countries, who continued to plead for assistance and generosity of the largely unresponsive partners from the North. At the same time, the South, and especially its two major countries with rising and industrializing economies and very large populations aspiring to higher standards of living, was depicted as the looming global environmental threat of the future.

These changes and the stance of the developed countries were significantly influenced by the policies and outlook of the leading power, where domestic and corporate interests exercise influence in key domains. Its position determines permissible international outcomes and possible directions, given the “convoy syndrome” which must travel at the speed of the slowest ship.

Indeed, the dominant view and policy orientation among powerful, ascendant conservative forces in the North played a major role in stalling, in fact holding hostage the ambitious international agenda, slowing down and delaying timely responses and actions to global environmental challenges for decades. Significantly, this generalized trend also diminished the importance and influence of the favourably inclined social forces in the North, which had played a leading role in the earlier period, both in placing issues on the agenda and in defining possible responses. These were marginalized from the establishment and found a solace in the civil society encampment.

2012: Rio +20 / Stockholm +40 Conference and after

Forty years of this environment-development conceptual and policy tug-of-war have not changed the underlying causal problems, nor have they removed the



Rio de Janeiro, Brazil

fundamental issues of controversy. North-South tensions over mutual responsibilities and roles are as present and acute as ever. One such area is the recent emergence of the “green economy”, as the supposed panacea and rallying cause for attaining goals of sustainable development, more specifically those having to do with climate change, and thus helping shield Planet Earth and human civilization from risks posed by contemporary society, economy and world peoples who all claim their rights and have high expectations.

The “green economy”, depending on how it is eventually defined and translated into practice, could mean the narrowing of the vision, the sectoralization of approaches, shrinking of the agenda, and distancing from the integrated and holistic vision embodied in “early works” on environment-development, initiated at the time of the Stockholm Conference. Also, it risks a new round of definitional and political squabbling over the meaning, intent and implications of “green economy”, with the resulting delays and diverting attention from needed action.

Rio+20/Stockholm+40 will no doubt delve on these questions. It offers an opportunity to revisit and revive the early environment-development issues and goals, and to examine learning and experience, in order to chart the road to the future. It is an occasion to initiate efforts to transcend the obstacles

encountered to date, including those related to the current globalized ideological headlock, the policy compulsions originating in some countries, and the interests of the increasingly influential and powerful corporate players with a global reach.

While the “green economy” offers useful solutions and approaches which need to be pursued in the quest for sustainable development, unless it is placed in an integrated context it is likely to result in new forms of inequities and problems between the advanced and developing countries. And it should not be reduced to or subjected to such incentives as greening corporate image, profit, the development and export of new technologies, the creation of new jobs or the energy independence in a single or a handful of developed countries.

A “green economy”, or rather a “green society”, should be placed in the context of a changed world economic and political order, inspired by the shared needs and welfare of the global community, as was posited, rather idealistically, during the earlier stages of international deliberations on environment-development. The climate change problématique, by its very nature and by requiring an integrated, holistic approach, may yet turn out to be the magic key that will open the door for the humankind to engage seriously with the multiple challenges it faces and to reinvent the global civilization needed for a promising future.

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Forty years of this environment-development conceptual
and policy tug-of-war have not changed the underlying
causal problems, nor have they removed
the issues of controversy

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One question that arises today is whether the countries of the South, 4/5 of this humankind, are ready to take the lead in orienting the discourse on sustainable development, the green economy and climate change? Will they admit the futility of pleading with unresponsive developed countries, who now eye the markets of the South as an opportunity to sell their advanced “green” technologies and know-how, on commercial terms much like they do with their pharmaceuticals? Should the developing countries not conclude that trying to persuade the North through endless negotiations and debate may not be the optimal strategy to follow, and needs be accompanied by their more forceful, independent and self-reliant South-South cooperation and stance?

The answer to these questions is a conditional “yes”. No doubt the growing importance and economic power of some major developing countries, their S&T advances, the diversification of their economies, and their cumulative experience and expertise can and will contribute in this direction. As important, the developing continents – Africa, Asia and Latin America – occupy the central, strategic position in search for solutions.

In what has to be a joint quest by the international community, one should draw lessons from the efforts that have already been invested in this complex subject and which remain relevant and topical today. More importantly, however, one should work to understand the nature of the contemporary global system and seek promising approaches and solutions.

This objective also calls for the revival of holistic thinking and vision. This is a role and task for which the United Nations is mandated and best positioned, but which has been constrained and significantly eroded in the recent decades of unipolarity, primacy of economic and financial reasoning, and undermining of UN capacity to think and lead on global systemic issues. Can the 2012 Rio event provide an impulse in this direction and make possible genuine, enlightened planetary analysis and policy-making on this subject of critical importance for the future of the humankind?

A pro-active Global South that sees itself as an equal partner and a legitimate policy leader in the global arena, a reenergized United Nations secretariat entrusted with a global mission, and the like-minded North consisting of both the civil society

and certain governments, would form a powerful global coalition that could influence the nature and outcomes of the 2012 Conference.

And, if the Conference, given the strength of the neo-liberal edifice, both in the North and in the South, the resilience of interest-based geopolitics, the strength of parochialism, and the usual short-term outlook that is prevalent, yields another least common denominator consensus that is acceptable to the forces of the systemic status quo, then at least, an alternative paradigm will begin to be articulated and take shape during the Conference preparations and proceedings, and on its margins by civil society, much as happened during earlier conferences.

Such a paradigm, and the supporting conceptual and policy framework, would play a positive role in the post-2012. This period will represent the fifth decade of continuing efforts to attain the elusive and demanding objectives of the planetary sustainable development agenda. Its outcomes are uncertain, except that once it is over in the year 2022 it will be crowned with yet another planetary gathering. By then, half a century would have elapsed since the Stockholm Conference, which started it all.



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Social policy, participation and the transition to a green economy

Sarah Cook, Peter Utting and Kiah Smith

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The authors examine the various ways in which the social dimensions of sustainable development are currently incorporated into debates around the goals of, and transition paths towards, a green economy. They propose two sets of policy considerations that they suggest are essential for any green economy transition – social policies and participation – and consider what kind of social policies, together with broader public action, forms of participation and accountability will be needed to produce transition paths in which green and sustainable economic development is compatible with goals of social justice, equity and poverty eradication.

Framing the debate: Where and how does the 'social' fit?

Current discussions over green economy increasingly acknowledge the place of social alongside economic and environmental dimensions of sustainability. Nonetheless, social dimensions tend to receive least attention, from the conceptualization of the problem through to policy recommendations. Within the literature, social issues and responses to them are defined in a variety of ways. Most frequently, these involve a focus on categories of people – the poor; those considered vulnerable by reason, for example, of age or gender, location or ethnicity; those likely to be affected most directly by climate change (often overlapping categories with the above); or those likely to be disadvantaged by transitions to green economy (workers in 'dirty' industries). In these terms, responses are most likely to be framed as protection, or as adaptation to enable the most vulnerable to manage and respond to climate related risks. Policy issues are identified that (i) have significant 'social' consequences (those affecting the livelihoods and well-being of individuals, families and communities, or (ii) have wider implications for the public good and where economic and social goals can be

complementary, such as achieving climate and employment objectives through green (and decent) jobs; compensating for potentially regressive impacts of carbon taxes; or the empowerment of communities to manage their own resources.

Policies for addressing the social dimensions of sustainability thus range from compensatory forms of social protection, through a 'green jobs' agenda aimed at mitigation (and to a lesser extent adaptation), to approaches that address the institutional and governance incentives that structure systems of production, consumption and distribution. Debates are framed in terms ranging from the residual interventions needed to ensure the efficient working of the market, to more transformative agendas around human rights and social / climate justice, and to calls for alternatives to globalisation and market liberalisation policies. The type of discourse used by different actors reflects diverse worldviews, interests, experiences, location and capacities. The latter approaches in particular suggest that contestation among different social actors will shape transition paths particularly where initial patterns of production, consumption and distribution are perceived to be unfair.

Table 1 below provides a schematic overview of key relationships between green economy transition paths, as found in the literature, and identifies the ways in which social dimensions are incorporated.

Table 1: The social dimensions of transition paths under different models for 'Green Economy' ¹				
	Green Capitalism	Strong Sustainability	Social Economy	
Worldview	Market liberal	Institutionalist	Social green	
Social	'Green' jobs Social protection for vulnerable groups Equality of opportunity Consultation Green consumerism	Global cooperation Stronger local & national institutions Inter/intra-generational equity Capacity building Social dialogue; social pacts	Rights-based Social justice Equity, as equality of outcomes Ethical consumerism Empowerment Citizen action	
Environment	Eco-efficiency Technology transfer REDD	Eco-regulation Stronger and more effective global environmental governance regimes REDD+	Environmental justice Agro-ecology Grassroots environmental action	
Economy	Low-carbon 'green' growth Voluntary CSR Market mechanisms to revalue environmental externalities (e.g. carbon markets) Production focused	Economic and trade reform Green finance Green taxes (i.e. redistribution) Enhance state capacity	De-globalization Localisation of trade and production Reforms to global economic institutions From international investment agreements to regional solidarity	

Source: authors

The approach in the first column, which can be characterized as 'Green Capitalism', adopts an essentially liberal market approach² centered on technological, economic and institutional conditions and innovations conducive to low-carbon 'green growth' and eco-efficiency. It relies on markets as the key mechanism for achieving the transition (through investment, R&D, technology transfer and industrial restructuring), with limited emphasis on the role of the state except as regulator and as provider of minimal protections. Business or private sector behaviour is assumed to change through altered market incentives and pricing policies which reflect true environmental costs (or externalities), coupled with voluntary initiatives (through corporate social responsibility). Poverty reduction is assumed to follow largely from new jobs generated by 'low carbon growth', pollution reduction and environmental remediation. Changes to institutional and governance arrangements, related for example to labour, trade,

technologies and regulation, are supported to the extent that they continue to "fit" with or reproduce a market liberal worldview.

Here, interventions related to the social dimensions are principally compensatory and protective, with efforts to minimise negative social impacts through assistance to those affected either by climate change or by the transition path - often assumed to be those who are already poor or vulnerable. Social protection mechanisms are likely to include social assistance programmes for vulnerable groups, along with efforts to support employment and income generation (possibly linked to adaptation efforts). Participation - again, often of representatives of already poor or vulnerable groups - is generally understood as improving 'consultation with key stakeholders' through governance processes in which individuals are informed and given opportunities to sit 'at the table'. However, in some cases, the social dimensions are presented as residual issues that

flow from the implementation of an efficient market transition.

The second column summarises what has been termed a 'strong sustainability' approach² that links green economy with governance and institutional reforms, and that places greater emphasis on the need to address forms of vulnerability and inequality that hinder a 'just' transition. This implies changes in institutional or governance arrangements to support industrial restructuring, requiring shifts in both production and consumption. It recognises a stronger role for the state and public policy, and for global governance mechanisms, in managing and facilitating the transition. It also places more weight on policies that may affect distributional outcomes as well as on the incorporation of a wider range of social actors in decision-making processes, largely framed as 'social dialogue'. From a social perspective, it is likely to build on and extend the kind of social protection interventions

described under the first approach. While stronger public policies tend to be defined largely in terms of *environmental* interventions, regulations or financing mechanisms, this recognition of the role of the state nonetheless provides a basis for identifying *social* policy instruments that can simultaneously support sustainability and equity objectives. (Such policy options will be elaborated in the following section).

A third perspective, associated most strongly with climate justice, social economy or alter-globalisation movements, draws on the discourse of rights, and recognises the need for redistribution and deeper structural change to overcome initial inequalities. Advocates of such approaches often promote participatory governance and policy processes that empower local people in ways that can ultimately alter economic and social relations between key actors - states, business and civil society. While many of the social protection interventions noted above remain necessary, such mechanisms are recognised as short-term responses that need to be complemented by more fundamental transformations of social relations and institutions, and in the distribution of power and resources. Inevitably, these more transformative goals reveal the contested nature of the green economy, and highlight the diverse forms of politics and range of actors - from the local to global levels, and from individuals to collective groups - that will be involved in such transitions.

Without attempting to be exhaustive, these approaches broadly illustrate three general 'transition paths' to a green economy found in the literature. While no one approach represents a blue print for change, they highlight a number of critical features with different emphasis placed on a range of goals, institutional arrangements and mechanisms that could shape green economy transitions. Key variations related to the social dimensions include the role of market versus state; the definition of solutions as technical, incremental or requiring deeper structural transformation; the power and participation of different actors; and the extent to which pre-existing inequalities need to be addressed to achieve a just transition. The following sections elaborate on two elements, which could be situated within the strong sustainability and social economy approaches, that to date have been relatively neglected in the discussions: the role



of social policies and the need for a renewed politics of participation.

Beyond protection: social policy as an instrument of transformation

Social policy is defined as the range of public policies or state interventions designed to manage social risks. Key social risks covered by welfare states have included loss of employment and falls in income, fluctuations of income over the life cycle (particularly through ageing), ill-health and disease, malnutrition, illiteracy, effects of natural disasters and resulting displacement, social integration, lack of access to basic services such as energy and water, and the burden of social reproduction (child-bearing and rearing, caring for other family members). Because such risks have wide social consequences, governments have taken on the role of financing, regulating or ensuring the provision of collective or public goods that contribute to general welfare. Different 'welfare regimes' with varied levels of coverage and benefits, lead to different welfare outcomes in terms of poverty and inequality.

Ecological threats posed by climate change present more pronounced social risks (or more accurately - uncertainty) not initially incorporated into the design of welfare policies by industrialised states. We can now recognise the costs to the environment - and thus the creation of social risks - of a high carbon economy. A just transition to a sustainable green economy needs to recognise the necessity of an economic model that

minimises and mitigates social risks going forward, as well as the need to address those social risks already created by the economic development path to date.

What role can social policies play in this process? Historically, states - from Western Europe to East Asia - have used social policies for various purposes: to support economic production as well as for protection and redistribution; for achieving goals of nation building and social cohesion, as well as developmental and welfare purposes, and for facilitating transitions as well as mitigating their impacts³.

Social policies are a key instrument for building the human capital and productive capacities of the labour force, particularly at times when industrial upgrading or other major economic shifts are needed. They are used also to shift consumption patterns, for example as part of demand-side stimulus programmes. Similarly, they can be used to shape patterns of investment - towards social infrastructure, housing or public transport, enhancing economic activity alongside social outcomes. Social policies have also been used to reduce the private burden on the household (and more explicitly on women) of *social reproduction* - caring for children, the sick and elderly, as well as the daily tasks involved in ensuring a well-nourished, healthy population and labour force. Such policies are often justified in terms of gender equality and by enabling women to enter paid employment. A sub-set of social policies include *social protection* to assist



more vulnerable social groups, as well as social policies for the redistribution of income and cross-subsidisation of food, fuel and basic human services such as health care, education, electricity and water.

The multiple roles and transformative potential of social policy become increasingly relevant in today's world where production, consumption, distribution, reproduction and protection must be addressed simultaneously (and urgently) within an increasingly resource constrained environment. In the context of climate change, welfare regimes need to adapt and respond to new risks and uncertainties but can also provide key instruments for the structural transformation to a green economy.

Current policies focus primarily on a set of social protection interventions to protect the poor and alleviate poverty (notably cash transfers or public employment instruments). Within the UN's Social Protection Floor these are complemented by access to health care and other basic services. An even broader set of social policy instruments could combine environmental and poverty reduction goals. A good example would be a focus on *energy poverty*: this impacts harshly on, for example, the daily lives of poor women responsible for providing food to families or workers with limited transport options. For such groups, energy intensive products constitute a large share of household expenditures (fuel, food, transport, housing) which could be reduced through

creative public policies that address social and environmental goals while also creating employment.

Sectoral change at the production level has huge implications for employment, with significant potential for job creation in sectors that support a green transition, such as the production and maintenance of green technologies, the provision of environmental services, and the reactivation of small-scale agriculture, all of which can be accessible to the poor in low income countries. This demands investments in skills, education, training, health and infrastructure that underpin productive capacities. The provision of basic infrastructure and services that support family care, as well as decent work for health and care-workers, can also create socially necessary and 'green' jobs. Beyond 'green jobs', however, there is little analysis of broader labour market and employment disruptions or opportunities arising from a green economy transition, and their implications for poverty, equity and inclusion.

Shifts in consumption are also needed for a green economy, and could be facilitated by more concerted policy interventions – to change consumption patterns in ways that shift resources to the poor. Social policies are among the key instruments used by states to influence or change behaviour, for example, through direct transfers and conditionalities, through the tax system, pricing or other rationing or redistributive mechanisms, the provision of social goods

(low cost housing, public transport, health care) or through regulation. For example, policy choices could ensure that new social housing that conforms to higher environmental standards also provides employment, improves well-being, and is more resilient to disasters while also reducing emissions. To date, however there is limited focus on the behavioural changes necessary (and by whom) to support a wider mitigation agenda; or on the policy incentives to ensure such changes at the necessary scale and speed.

The distributional consequences, both of environmental and climate crises themselves, and of the policies required for a transformation to sustainability, will also require strong social policies that many welfare states have managed. Redistributive goals and mechanisms must be built in centrally to any equitable and sustainable transition path that is to achieve poverty eradication. This includes both current and inter-generational equity. Historically, redistributive processes have occurred through interactions between economic policies and varying processes for gaining of political consensus around public policy goals, resource mobilisation and redistribution. At their best, social policies have successfully enabled the major challenges and concerns of societies outlined above to be addressed.

The challenge of climate change raises additional challenges that the field of social policy will need to tackle. First, social policies need to be increasingly concerned with *uncertainties* and complexity associated with climate change, rather than only with traditional social policy risks. Second, the systems themselves will need to be more flexible and adaptable to respond to such uncertainties (for example, where large populations may be suddenly affected, where migration is likely to increase, or where resources – e.g. water – become a source of conflict). Third, climate change risks are not bound by national borders, and will require new cooperation around global social policy issues. Finally, a social policy lens is likely to identify opportunities and instruments for transformation that differ from those based on economic or scientific analysis. The next section addresses the kinds of politics, participation and accountability of social actors – states, business, civil society, communities and individuals – that are essential to integrating the social dimensions within any approach to green economy.

Beyond consultation: participation, empowerment and accountability

Which green economy model and transition path prevails will depend not simply on rational decision-making by leaders and technocrats informed by consultations with stakeholders; it will rely on political processes and governance arrangements, including the balance of social forces, collective action by social movements and organised interest groups, the nature of claims-making and participation in knowledge networks and policy processes, as well as coalitions, alliances and social pacts. 'Active citizenship' and contestation have a crucial role to play in transforming relations of power and patterns of inequality underpinning poverty and unsustainable growth.

In the 1970s, UNRISD defined participation as "the organised efforts of the hitherto excluded to gain control over resources and regulative institutions"⁴. Since then, participation has been widely assimilated into the discourses of mainstream development agencies and actors. In the process, however, we would argue that key aspects were lost in translation. 'Participation' was often reduced to 'consultation' or 'dialogue' with selected stakeholders. Key elements such as organised efforts or collective action were sidelined. Similarly, mainstream institutions borrowed the term 'empowerment' from more radical discourses but defined it in terms of 'gaining voice' rather than 'gaining control'. Social actors became 'stakeholders', whose involvement is needed to improve the success of projects. Contestation, social mobilisation, collective action and the notion of interest group bargaining were sidelined as persons or NGOs claiming to have affinities with the disadvantaged were welcomed to the table to share their views. Such consultative processes not only marginalised forms of participation that are key in any transformative process, but there was no guarantee that 'voices' would actually be heard or significantly shape decision-making processes, or that subaltern groups would be effectively represented. Change resulting from such processes has generally failed to transform mainstream policies, institutions and structures.

By contrast, our analyses suggests that participation and empowerment for transformative change is more likely to follow in the wake of **(a)** contestation and conflict, as

groups affected by environmental degradation react to threats in defense of livelihoods and rights; **(b)** social organisation, as groups strengthen their organisational capacity for collective action; **(c)** social movement activism to frame public opinion and policy agendas, **(d)** campaigns and advocacy, as groups and grassroots or civil society organisations set more formal objectives and propose concrete demands and alternatives; and **(e)** coalitions for change, as groups garner support from allies associated with civil society, local and national government, international organisations and business. Furthermore, civil society organisations can act as a conduit for local knowledge to shape public policy. These elements extend far beyond 'stakeholder dialogue' or consultation. They draw attention to the need for active citizenship in making claims on the state or other power-holders, in order to shape policies that are just and, in particular, address the needs of vulnerable citizens.



While much research and practice has focused on enhancing the capacity of the poor to mobilise resources and access decision-making processes, it is also necessary to regulate the powerful. Actors and institutions, whether of the state or the corporate sector, must be accountable to those affected by their actions, with penalties incurred in instances where they have not complied with agreed standards. Furthermore, disadvantaged groups must have the right to effective remedy and redress through judicial and non-judicial institutions that can play an arbitration role – whether at local, national or international levels. Accountability of corporations, including transnational ones, for social and environmental impacts will be crucial to any equitable green economy transition. Key social processes for increasing accountability around these issues include:

- (i)** campaigns of social movements, NGOs and trade unions (for example against deforestation and mining practices, or for ethical and Fair Trade) that raise awareness of particular social/human rights and environmental problems, and exert social pressure on large corporations to modify their behaviour;
- (ii)** networking that connects actors at local, national, regional and global levels;
- (iii)** consumer and shareholder activism;
- (iv)** participation by NGOs and trade unions in the governance structures of standards-based institutions involved in monitoring, reporting and verification (such as the Forest Stewardship Council and the Ethical Trading Initiative);
- (v)** watchdog organisations (such as Oil-Watch, BankTrack, OECDWatch);
- (vi)** participation in complaints procedures and processes aimed to seek redress, for example, through Public Interest Litigation in India or the Permanent People's Tribunals in Latin America;
- (vii)** coalitions and alliances between civil society organisations and progressive business interests (for example, to control conflict diamonds and corruption in the extractive industries); and
- (viii)** 'active citizenship' directed at states to ensure that public policy and law play a key role in business regulation and are not sidelined by business preferences for self-regulation and voluntary initiatives.

Such actions require a strong role for state and civil society in monitoring and regulating business. However, the broad-based participation of marginalised or vulnerable groups within such processes does not necessarily equate with their empowerment. Powerful actors and institutions are able to resist change, dilute agendas and policies for reform, partially or selectively accommodate oppositional demands, and otherwise control the agenda of change. In relation to green economy transition, corporate power is likely to resist a tougher regulatory environment and to promote agendas favouring corporate environmental responsibility through eco-efficiency (reductions in energy use relative to output rather than absolute reductions), voluntary initiatives and private regulation. However, such approaches have limits. For example, research indicates that voluntary re-regulation of trade through fair or ethical trade schemes offers some benefits to some categories of farmers, but they may also reproduce local level inequalities



(excluding women farmers, for example), and only minimally improve environmental sustainability or local food security. Such examples highlight the potential contradictions between approaches to green economy laid out in Table 1.

Social activism associated with the green economy is at present relatively fragmented. Nonetheless, there would seem to be considerable potential within Rio+20 processes for greater civil society engagement in processes that simultaneously address economic, social and environmental issues. This would open up greater possibilities for addressing the structural roots of poverty, social rights and inequality, with

participation from a broader range of social actors in policy making, while moving to a sustainable economy.

Conclusion

Rio+20 presents a much-needed opportunity to deepen the international community's policy response to the challenges of sustainable development outlined at the first Earth Summit in Rio in 1992. Whether current thinking around green economy will meet that challenge will depend to a large extent on ensuring social dimensions are repositioned centrally within discussions of economic and environmental sustainability.

What is evident is that any new model for sustainable development must address the barriers to achieving inclusivity, equity, empowerment and rights on a global scale; to do this social policies must be more than residual or compensatory mechanisms; the ambition must go beyond creating new employment opportunities and ensuring minimal livelihood protections for the poorest; and a more politicised notion of participation should be addressed. In this paper we have pointed to the possibilities for framing the discussion to achieve greater balance between economic, environmental and social objectives, as well as to some promising policy avenues for reconciling developmental goals with greater social justice.

Notes and references

- 1 Adapted from Clapp, J. and P. Dauvergne. 2005. *Paths to a Green World: The political economy of the global environment*, MIT Press, Cambridge Massachusetts and London.
- 2 Neumayer, E. 1999. *Weak versus Strong Sustainability: Exploring the limits of two opposing paradigms*, Edward Elgar, Cheltenham, UK.
- 3 These ideas have been developed at length in work by UNRISD. For summary discussions, see for example UNRISD 2010 *Combating Poverty and Inequality: Structural Change, Social Policy and Politics*; UNRISD (2006). *Transformative Social Policy: Lessons from UNRISD Research*, Research and Policy Brief no. 5, UNRISD, Geneva (p. 2-3).
- 4 UNRISD (2003). *Research for Social Change*, UNRISD, Geneva (p. 69).

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Development that meets the needs
of the present without compromising
the ability of future generations
to meet their own needs

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