Alexander Carius, Dennis Tänzler, Elsa Semmling (Eds.)

The Rise of the Green Economies

A Paradigm for the Developing World?

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A New Paradigm for the Developing World?

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Preface

by ***Achim Steiner***
(UN Under-Secretary-General, UNEP Executive Director)

Thinking on the green economy has made remarkable advances in the past few years. From its beginnings as little more than an intriguing idea on the margins of environmental economics, it is now a powerful policy framework for governments around the world for reaching their sustainable development targets.

Driven by a growing understanding of ecological constraints and the knowledge that economic prosperity must fundamentally derive from good stewardship of natural resources and environmental wealth, governments throughout the world have started to explore ways to decouple growth from environmental degradation.

At the Rio+20 Conference in 2012, the international community recognized the green economy as a key tool with which countries could achieve that decoupling and attain sustainable development. To date, some 65 countries have embarked on green economy and related strategies, and 48 are taking steps to develop national green economy plans. At the same time, a healthy debate has continued about the green economy and its role within the sustainable development landscape.

Indeed, as we move towards implementation of the Sustainable Development Goals that will define the post-2015 development agenda, it is more important than ever to turn the lens upon the inclusive green economy. We must ask ourselves how this approach can help deliver key development priorities such as social inclusion, decent work, climate change mitigation and adaptation, and sustainable economic growth and poverty reduction.

As we reflect on these issues, this book can be a useful guide. It takes a systematic look at the green economy, examining how and where it has been imple-

mented, and to what effect. What shape does the green economy take at the national level, how does it reflect the variety of national contexts into which it must fit and what factors have led to successful implementation of policies? By approaching these questions from a number of analytical perspectives, the authors enrich our understanding of the inclusive green economy concept and its role in driving the global development agenda, both now and in the future.

This book is a welcome addition to the ongoing debate on sustainable development. It transcends economics to look at how inclusive green economy can contribute to environmental well-being, as well as more inclusive and equitable societies.

PART 1

TOWARDS A GREEN ECONOMY

Strategies for Implementing a Green Economy in Rapidly Emerging and Developing Countries

by ***Steven Stone*** *(UNEP)*

1 Introduction

While the concept of a green economy continues to evolve following the negotiations at the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference), there is no doubt that a transition to a green economy is already underway.

From China's new 'ecological civilisation' concept to Ecuador's 'buen vivir' (living well) development goal, and from Nepal's National Youth Forum for Green Solutions to South Africa's Green Economy Accord, there is now growing evidence that countries are aspiring towards low-carbon, inclusive growth and environmental sustainability.

Some of these countries began their journey long before the concept of green economy started to gain traction, following the financial crisis in 2008. Bhutan first rejected gross domestic product (GDP) as an indicator of wealth in 1971, and chose instead to measure gross national happiness (Costanza et al. 2009). Barbados first declared building a green economy as a priority in its National Strategic Plan for 2006–2025, and has since set out to achieve many of its mid-term goals (UNEP, undated, a). Ghana first addressed the issue of fossil fuel subsidies in 2005, and redirected these funds instead for education, health, transport and rural electrification (IMF 2008).

Many more countries, such as Bangladesh, the Democratic Republic of the Congo, Pakistan and Zambia, have expressed interest in moving towards a low-carbon future that provides prosperity for their countries without creating environmental liabilities.

The Republic of Korea has helped drive a wave of support for a green economy approach by demonstrating the benefits to be gained from greening key economic sectors. In 2009, it announced its plans to launch a five-year Green Growth Plan and dedicated more than 80 percent of its economic stimulus package (equivalent to 38.1 billion US dollar in 2009) to improving its energy, freshwater, buildings, waste and transport (HSBC Global Research 2009).

Even fossil-fuel rich countries, like Azerbaijan and the United Arab Emirates, are exploring how they can use their oil and gas revenues to help transition to a green economy.

What all of these countries have in common is their desire to promote sustainable development — creating opportunities for socially-inclusive economic growth that will not further drain the planet's resources, but help protect them so they can continue to provide vital ecological services to all mankind.

Grounded in the principles of sustainable development, the transition to a green economy is considered a journey. As the Rio+20 declaration reaffirmed, each country must choose its own pathway towards an inclusive green economy — one based on its unique natural assets and national priorities. However, developing and emerging countries, in particular, should be supported by United Nations agencies, international organisations and financing agencies as they embark on this new path to build a more inclusive and sustainable economy.

2 Multiple Green Shoots

There is a strong business case to be made for moving towards a green economy, and developing and emerging countries stand to gain from pursuing these new opportunities. For example, the market for clean technologies is growing. The cost of solar photovoltaic panels has dropped dramatically since the 1970s to less than one US dollar for a kilowatt-hour today. In China, the government has a goal to produce 15 percent of its primary energy from non-fossil sources by 2020 (State Council of P. R. China 2014), while in South Africa, the government has ambitious plans to install solar water heaters in a large number of homes and businesses by 2030 (NPC 2013).

A new study produced by United Nations Environment Programme (UNEP) for the Government of Kenya indicates that under a green economy scenario, the country could achieve faster economic growth — five percent of GDP compared to 3.7 percent under a business-as-usual model — by 2030, while increas-

ing stocks of natural capital and reducing the ecological footprint of the economy. Real per-capita income for individuals could rise from 40,000 Kenyan shillings to as much as 64,000 Kenyan shillings, reducing the number of people living below the poverty line by an additional three percent (UNEP 2014).

In Peru, the bio-trade sector expects to deliver economic, environmental and social benefits, particularly for the country's rural poor. If the bio-trade sector maintains its current growth rate of 20 percent until 2020, employment could increase from 10,000 workers today to 60,000 workers. This will also contribute to poverty alleviation because it is estimated that each bio-trade worker usually supports a family of four to five people (UNEP 2012a).

These initiatives are what Achim Steiner, the UNEP Executive Director, calls "the tender shoots" of the green economy — the first rays of hope that an alternative future is possible.

The UNEP's report *Towards a Green Economy* (2011) shows that an investment of two percent of global GDP across ten key sectors, when backed by the right policies, can create a global shift to a more sustainable economic model — one that values nature and jobs. Developing and emerging countries, in particular, are eager to embrace this new development pathway precisely because they see the potential.

These countries not only have the most to gain from a green economy, but are also well-positioned to do so. Many developing countries have not invested in the fixed assets and infrastructure that limit them to the same outdated and inefficient technologies found in developed countries, and many still have substantial natural resources, which can directly benefit large portions of their population. This allows them to leapfrog developed nations, who must incur higher costs to make the transition to a green economy. However, developing and emerging countries still need access to resources, capacity building and technology if they are to embed this paradigm shift in their national policies.

3 Key Outcomes in Rio+20 Declaration

The Future We Want calls for new strategies and tools for countries to use as they transition to a low-carbon, resource efficient and inclusive economy (United Nations 2012). The declaration clearly establishes the green economy as a legitimate driver of sustainability, and it urges United Nations entities, governments, international institutions and non-governmental organisations to assist coun-

tries in their transition by responding to demands for technical assistance and policy advice, best practices and progress reports.

The declaration encourages "the implementation of green economy policies by countries that seek to apply them for the transition towards sustainable development as a common undertaking" (paragraph 59). It notes "the positive experiences in some countries, including in developing countries, in adopting green economy policies in the context of sustainable development and poverty eradication through an inclusive approach", and welcomes "the voluntary exchange of experiences as well as capacity building" (paragraph 64).

More specifically, the declaration seeks support for countries interested in making the transition to a green economy, by inviting the United Nations system, in cooperation with relevant donors and international organisations, to coordinate and provide information upon request on: a) matching interested countries with the partners best suited to provide requested support; b) creating toolboxes and/or best practices in applying policies on green economy in the context of sustainable development and poverty eradication at all levels; c) establishing models or good examples of policies of green economy in the context of sustainable development and poverty eradication; d) developing methodologies for evaluation of policies of green economy in the context of sustainable development and poverty eradication; and e) bolstering existing and emerging platforms that contribute in this regard (paragraph 66).

In the area of green jobs, the Rio+20 declaration calls for a strategy on youth and unemployment, and notes the need for building capacity and sharing knowledge on decent work and job creation.

On the issue of metrics and indicators that can measure and track countries' progress, the declaration recognises "the need for broader measures of progress to complement GDP in order to better inform policy decisions", and it requests the UN Statistical Commission in consultation with other agencies to "launch a programme of work in this area building on existing initiatives" (paragraph 38).

The significant role the private sector will play in a green economy transition is also highlighted. The declaration calls for enhanced corporate reporting on sustainability indicators (paragraph 47), something UNEP and its partners have advocated for many years.

Other actions mentioned in the declaration, especially relevant to developing and emerging economies, include references to phase out harmful and inefficient fossil fuel subsidies that "encourage wasteful consumption and undermine

sustainable development". It also asks governments to consider reflecting on the environmental impacts of such policies.

The general sentiment resulting in the Rio+20 conference is that those countries wishing to push ahead with green economy reform agendas to transform their economies should be encouraged and supported in the development of their national plans.

4 Strategies for Advancing a Green Economy

Despite countries' different geographies and political and economic persuasions, many are already creating national strategies and, in some cases, mounting regional efforts to advance a green economy that will help them address unemployment, inefficient industry, environmental risks and outdated policies. While priorities, resources and asset base may vary, there are some key enabling conditions that national governments can adopt, such as: establishing sound regulatory frameworks; prioritising government investment and spending in areas that stimulate green growth and green sectors, while limiting spending in areas that deplete natural capital; employing market-based instruments, incentives and taxes; and investing in capacity building.

The Future We Want also notes the need for new green economy measures — again, such tools that can help guide national policymakers as they create new green economy policies and evaluate their progress moving forward.

Examples being set by national governments are also driving regional action. With poor access to energy, especially in Sub-Saharan Africa, the East-African Community has decided that energy security is a priority. Since 2007, Uganda, Kenya, Tanzania and most recently Rwanda have all introduced feed-in tariff policies, which have had a direct impact on renewable energy businesses in the region. It is hoped that such cooperation will also help stimulate much-needed investment (World Future Council 2013).

Across the continent, various government conferences and forums have provided high-level endorsement for the concept of green economy as a means for achieving sustainable development and poverty eradication. Following the Rio+20 conference, the African Union launched a programme to facilitate funding and technical assistance to help countries pursue this agenda.

In Asia, governments have responded to the Rio+20 call for action in part due to the need to reduce consumption and pollution across a number of sec-

Box on Barbados:
Social partners support key to national implementation

This small island state first adopted the green economy concept as part of its national plan in 2005. The process was given further impetus in 2009, when the then Prime Minister committed Barbados to become "the most environmentally advanced, green country in Latin America and the Caribbean". The Government of Barbados then established a partnership with UNEP to help achieve this goal, which began with a scoping mission and macroeconomic assessment of five key sectors and four cross-cutting issues. A green economy technical committee, including representatives from national ministries, government institutions, non-governmental organisations and the business sector, was created to oversee the technical inputs. In addition, the country's Social Partnership—previously established to deal with the country's economic and social challenges—was also selected by stakeholders as the most appropriate body to oversee the implementation and monitoring of the country's Green Economy Roadmap (UNEP et al. 2012).

tors. Cambodia, China, Indonesia, Nepal, the Philippines, the Republic of Korea and Vietnam have all adopted green economy policies at a national level. Bangladesh, Pakistan and Papua New Guinea have also sought assistance to begin this journey.

In Latin America, a Green Economy Study for Mexico underway is assessing different fiscal and economic policy mixes to encourage investment in select key sectors with the aim of stimulating inclusive growth, green jobs and environmental sustainability, as well as economic competitiveness. In January 2013, a high-level roundtable on green growth, called "Public policies for an inclusive development: Mexico 2013" organised by the Economic Commission for Latin America and the Caribbean, the Inter-American Development Bank, the Organisation for Economic Co-operation and Development and the World Bank, reconfirmed that the country's future economic growth must be greener and more inclusive.

In the Caribbean, following the Barbados example (see box above), several countries have expressed their interest in developing their green economy strategies (UNEP, undated, b). The European Union has recently funded a region-wide initiative that will focus on working with governments in Haiti, Jamaica and Saint Lucia to develop their national strategies.

In West Asia, regional meetings have transitioned from green economy dialogue to action. In 2012, the United Arab Emirates Strategy for Green Development outlined the country's intentions to become a world leader in the export and re-export of green products and technologies, while maintaining its environment and economic growth (WAM 2015). In Jordan, one of the region's poorest economies, "environmentally-sustainable economic development" was adopted as a key theme in the country's 2006–2015 National Agenda (National Agenda Steering Committee 2005). In 2010, the Minister of Environment launched a green economy initiative in Jordan. An international team of experts then identified several critical sectors that Jordan could focus on to advance its efforts, and many of these recommendations are being considered by the government.

5 The United Nations' Coordinating Role

Following the Rio+20 conference, the United Nations Secretary General Ban Ki-moon mandated UNEP to co-lead the coordination and delivery of the key outcomes pertaining to national implementation. Now, in response to *The Future We Want*, UNEP and three other United Nations agencies — the International Labour Organisation, the United Nations Industrial Development Organisation and the United Nations Institute for Training and Research — have launched a new Partnership for Action on Green Economy (PAGE), which aims to provide countries with the tools and services required to build their green economy plans. The partnership will draw on the expertise and experience of each of these individual institutions to provide a comprehensive and coordinated suite of tools and technical assistance to 30 countries between now and 2020. Moreover, the partnership intends to serve as a 'nucleus' for other United Nations agencies, so countries can access all the assistance needed to advance their green economy strategies.

PAGE will focus on four components at the country level: advisory services, research, capacity building, and training and policy dialogues. PAGE will offer a suite of coordinated services, ranging from technical assistance and new research tools, to policy analysis and capacity building, as well as practical training in areas such as economic and fiscal policy, green jobs and the sustainable management of natural resources. It will also host a series of high-level policy dialogues, which will provide a platform for national governments and other stakeholders to share their progress and lessons learned.

In parallel, efforts will continue to promote inclusive wealth accounting, as well as the development of new indicators and metrics for measuring progress towards a green economy. UNEP recently released the first in a series of publications, *Measuring Progress Towards an Inclusive Green Economy* (UNEP 2012b), at its first global workshop on indicators in December 2012 (UNEP 2012c).

As a founding partner of the Green Growth Knowledge Platform (GGKP) with the Global Green Growth Institute, the Organisation for Economic Co-operation and Development, and the World Bank, UNEP is leading the research stream on green growth indicators to ensure policymakers and other stakeholders share their experiences and best practices moving forward (GGKP, undated). Through broad consultation and research, GGKP provides practitioners and policymakers with tools to foster economic growth and promote sustainable development.

For several years now, UNEP's Finance Initiative has been working with its private sector partners — including 200 financial institutions — to build the business case for sustainable management and reporting. It is especially focused on capacity building and training for national and regional financial institutions in emerging and developing countries. In Rio, a handful of countries, including Brazil, Denmark, France, and South Africa — all of which have helped pioneer sustainability reporting in their respective countries — created the Group of Friends of Paragraph 47, which aims to promote sustainability reporting by sharing their experiences (UNEP 2013).

Perhaps one of the more contentious topics covered in the declaration is the reference to harmful and inefficient subsidies, such as for fossil fuels. UNEP is continuing to address these inconsistencies in policies at the national level, while raising the bar on governments at the global level. Reforming fossil fuel subsidies is a realistic reminder of the battle ahead if we are to create a new economic paradigm — one that values growth and nature.

6 Conclusion

The progress to embrace a green economy has been slow and steady. The United Nations declaration mandates this work now be accelerated and scaled up to meet the increasing demands from developing and emerging countries.

The green economy — or rather, the numerous green economies — when they emerge, will be based on strong institutions, on good governance, and commu-

nities that value nature and human equity. They will be based on leadership at the local and national level, and they will be forged because they represent an alternative to the future we do not want. They will be based on markets that have been shaped to meet human needs and aspirations. And most critically, they will serve the goal of improving human welfare and social equity, while reducing environmental risks and ecological scarcities.

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The Inclusiveness of Green and Low-Carbon Development

*by **Sunita Narain** (CSE)*

1 What Is a Green Economy?

This is a question that continues to draw different responses; depending largely on who is asking and who is responding. The fact is that the world has still not found a common response because it cannot distinguish between brown and green economies in any meaningful way. The current model of the green economy seems to work best when it is painted over the brown economy model of the world. More importantly the current paradigm does not reflect the needs and priorities of different countries in different stages of development.

The starting point of the nature of the green economy must be to note the interconnections between the current growth model, which is built on consumption for wealth creation, and the challenge it poses to sustainability. We know today that an underlying cause of the financial strain is the dependence on cheap loans or cheap production to induce consumption, which in turn is needed to fuel economic growth. The world has not been able to design an affordable or equitable growth model that would meet the aspirations and purchasing abilities of people across the world, or indeed the needs of all populations across the world. There are limits to this growth model, as a fast growing planet is learning. It is not possible to emulate the lifestyles of already industrialised countries without compromising the future survival of the planet. These limits will require the world to share its ecological space so that growth can be afforded in a way that is sustainable for all.

The fact is we have been taught, and have practised what has been preached; that we can consume our way to growth and then consume our way out of any

slow-down period. The problem with this model is that we do little to ensure that we can bring the cost of the product down so that it is affordable. In other words, we do not plan, design, manufacture and sell products and services that meet peoples' purchasing abilities. We do not demand technology to work for affordability. We also do not share wealth so that more can afford this growth — afford the house or the car — without the loans that will cause the banks to boom and then go bust.

Over time, this simple logic of enabling people to only consume got lost in a labyrinth of economic and fiscal instruments designed to subsidise and advance credit, all to keep consumption-related stimulus going. Thus, as costs of production increased in the first world, because of increased costs of labour or environmental protection, industry moved to the second, third and even fourth world, to get a cheaper deal. This also helped to enjoin the entire world in the frenzy of 'buy cheap, buy disposable'. This model drove banks over the moon, over into the dark side.

This economic system has another dark side — growth is threatening to destroy life as we know it. Today, climate change is stepping up its pace. Each year, with seemingly increased intensity and ferocity, different regions of the globe are lashed with natural disasters and freak and extreme weather conditions. It is clear that these extreme weather events are devastating large parts of the world and are combining to make the poor even more poor and even more vulnerable. This is the beginning of the impacts of climate change, which science has so surely predicted would occur in exactly this manner. It is just that we refuse to read the writing that is so clearly on the wall.

We refuse to accept that the challenge is twofold: Firstly, the world has to reinvent the growth paradigm because it is costing growth itself. Secondly, the world has to reinvent growth as it is costing the earth.

But it is here that the world must realise the limits of the existing economic growth models in terms of future sustainability.

For one, the current economic growth model, based on capital and resource intensity, is intrinsically polluting. Its use of materials and energy leads to waste and pollution. Over the past years, the world has struggled to keep pace with the toxic fallout of its wealth creation. But it has never succeeded in containing the problem; in fact it always remains many steps behind the problems that current economic growth paradigms continue to throw up.

The fact is that all developing countries are today at the bottom of the development trajectory. Their pathway to the future will only add to global pollution. It

is also clear that the current options for drastic and long-term emission reduction are limited in the current industrial model of developed countries. This is the most inconvenient of all truths. The world has to find new growth models, which will need changes in behaviour and lifestyles, to cut emissions. The world also needs new drivers like drastic emission reduction targets in the rich world to stimulate quick and aggressive technology innovation.

The challenge is to build resilient economies that will eradicate poverty, and also to ensure that the poor, already living on the margins of survival, are not made even more vulnerable because of climate change. This requires a global growth model that is inclusive and sustainable. Only then can the green economy be truly green.

2 Limits to Low-Carbon Growth

It is clear that as yet, the world has not been able to settle the question of what a low-carbon growth trajectory can and must be for the future. In the current economic model, technology pathways are constrained. The emission-efficiency technology threshold of the current growth model gives each country only limited opportunities to cut emissions. This is when the world needs an energy transformation. We know the challenge is to drastically cut greenhouse gas emissions in an increasingly carbon constrained world. It is also increasingly evident that improving efficiency in the use of energy and materials is one part of the solution for the future. But this efficiency revolution is meaningless without a sufficiency revolution.

India is no different from the rest of the world. In fact, it is at the bottom of the development trajectory — it has a long way to go to meet its growth needs and the way ahead will only add to pollution. This is inevitable.

The report entitled *Challenge of the New Balance*, published by the Centre for Science and Environment, looks at precisely this question.[1] It takes apart six of the most energy intensive sectors in terms of their current emission profile and looks at the technology pathway for the future. These high-growth sectors — power, steel, aluminium, cement, paper and fertiliser — contributed almost 60 percent of India's carbon dioxide emissions in 2008–2009. The study

1 Bhushan, C. (2010): Challenge of the New Balance. A study of the six most emissions intensive sector to determine India's low carbon growth option. New Delhi: Centre for Science and Environment.

finds answers that should force careful re-thinking, not just in India but also globally, about how emissions can be cut, really and actually.

It finds that contrary to general perception, many industrial sectors (and companies) in India operate at global best levels as far as energy efficiency and greenhouse gas emissions are concerned. The study finds that industry has invested in better, and even the best, technologies because energy costs are high in India. This is not to say that more cannot be done to improve performance. But it also means that India is not the place where the world can look for easy and cheap emission reductions for the future.

India's cement industry, for instance, has already the lowest emission levels in the world because of its use of fly ash and slag. It is projected that India's per-capita production of cement will increase fourfold to 630 kilogram by 2030 — equivalent to what China produces today. But technology leapfrog options are limited — in the business-as-usual scenario, the study estimates that the only option is to further increase the use of fly ash and slag, which will reduce the industry's emission intensity by 25 percent in 2030. The low-carbon option is to install expensive waste heat recovery equipment — which is still in the experimental and development phase. If this is done, then the sector can improve its performance by cutting another ten per cent in its energy intensity by 2030.

Even the much-abused coal-based power generation sector — driver of the economy and the single largest contributor to carbon dioxide in the country — does not do so badly in its emission records. The country's largest power utility, National Thermal Power Corporation (NTPC), operates at 34.5 percent efficiency; one of the highest rates in the country if you consider the subcritical technology at use. In this sector, the biggest option is to invest in 'negawatt' — making more energy by saving and increased efficiency. These measures, from demand side management, to reduce technical and distribution losses could save as much as 20 percent. But still this is not enough, given the scale of the unmet energy need in the country. India has no option but to invest in building energy infrastructure, which however efficient and low-carbon, will not be enough.

The difficult part is what to begin now for the future. The fact is that in all high-polluting sectors, the technology options for emission reduction will stagnate after 2020. There is no real way we can reduce emissions, without impacting growth (as we know it) once we cross the current emission-efficiency technology threshold.

The only real option India has is to change the fuel-mix — what is used to derive energy to drive the economy. The options are limited and expensive. If the

country wants to reduce its use of coal, it must make major investments in developing solar, biomass or off-shore wind energy. The study assumes that in the business-as-usual scenario, power generation in 2030 will be roughly 2,200 kilowatt-hour (over 630 kilowatt-hour in 2008–2009), which is essential for affordable access to basic energy. It is assumed that approximately 70 percent of this power will come from burning coal — which is equivalent to the current ratio. In a low-carbon scenario, the dependence on coal can be reduced by as much as 35 percent by 2030. But this will require a fourfold increase in gas-based power generation, and as much as 100,000 megawatt of solar, 90,000 megawatt of wind and 50,000 megawatt of biomass energy. The reality is that we will not be able to substantially reduce our dependence on coal, which will continue to be the source for almost 60 percent of the power generated. We must remember that in countries like India, the challenge is to provide affordable power to massive numbers of people. The study estimates that the low-carbon scenario will cost as much as 60 US dollar to cut one ton of carbon dioxide emission. This is certainly not an easy proposition. Therefore, it will cost to move to low-carbon growth in the conventional way.

But the study also tells us that India must reinvent its growth pattern because it is in its interest to do so. It faces serious challenges to get the resources — from land, minerals or water — that are needed to drive progress. India's poor and users of its resources are asking for better benefit sharing so that growth does not compromise their future. In this way, there are limits to growth, unless growth can be different; sustainable and inclusive. The question is if India can use the limits to its advantage so that it can find ways of working beyond the current model.

The bottom-line is that India will have to find ways of doing much more with less. It will have to find new win-win options — such as growing biomass on people's lands so that they get both income and energy. Then there are options to leapfrog to distributed and decentralised energy systems, which will use renewable sources in ways so that the country does not have to invest first in building grids and transmission systems. Similarly, it can build homes that are affordable and yet green. This will mean re-thinking the 'green' building concepts, which are expensive and designed for the rich, when they are rich and energy flatulent. It will also mean building cities that minimise the use of energy or transform mobility. These options can be tried.

But what is clear is that today, the options for serious emission reduction are limited in the current industrial model. The world has to look for new ways to

cut emissions and pay for these. There is no easy picking here. What is also clear to us, in the emerging world, is that the new green economies must be substantially different from the brown economy of today. Only then will our future be different. Only then will our future be secure.

3 Protecting Forests: Green or Brown?

One indicator of a green economy is the protection the country gives to its forests. Another indicator is the increase of forest cover and wilderness areas in the country. Clearly, the wealth of forests are critical to safeguard a country's environmental security and important for global carbon sequestration. But the question is how should the indicator be designed? Is the protection of forests the right way to measure green growth that is inclusive and sustainable? Or is it better to measure ways in which forest wealth has benefitted the economies of people and how sustainably a country has been able to improve the productivity of its forest wealth for the benefit of its poorest? In other words, what is more important: forest protection or removing economic disparity using the wealth of natural resources sustainably?

In India, we know we need forests for our survival. But as yet, we are still learning how we will protect, regenerate and grow forests for the benefit of local communities. Each passing day the forestlands in India are under a big threat — not necessarily from the poor people who live in forests but from developers who want the land, minerals, water and other resources. Over time, the infrastructure imperative will clear forests, which have become the only free and available resource in the time of scarcity. The demand to open up forests will grow each day.

In this situation, India requires forests to be central to development. It is in this context that countries must discuss the potential of forests, both the intangible benefits of ecological security and tangible economic returns. This discussion is taboo in the forest-conservation circles, where the country has moved from extraction to protection, without clarity about how the land will be utilised for production.

This is why we need to design our green economy ideas carefully. India, way back in 1980s decided rightly that forest protection was paramount. It enacted a strict legislation that mandated that no forests could be diverted for non-forestry purposes unless there was permission from government. Under the Forest

Conservation Act 1980, every file for forest diversion travelled to the capital city of Delhi for clearance. There is no doubt this sternly worded legislation has been critical in safeguarding forests. Deforestation rates have come down. Cutting a forest has become tough, as its diversion requires clearance on file, payment of its net value and funds for compensatory afforestation.

The flip side is that people have no use for forestland. They do not benefit from the protection of forests. The irony is today that the richest lands of India support the poorest people. Poverty is rampant where there is natural wealth. This strategy of forest protection without providing benefits to local people is not working and will never work in countries where forests are habitats and not wilderness areas.

In this situation, green economy indicators for the protection of green wealth fail completely. The imperative is to design an economy that would allow for the re-positioning of forests in development strategy. Once countries have done this, the goals to measure progress will be designed right.

Conventionally, the only way regions can develop is by cutting the forests and building all that is known as infrastructure and signifies economic growth. Countries have cut forests, then cultivated land and built factories and cities. Now the question is how does a forested region grow with its forests, and become rich?

In this way the challenge is not only to protect forests but also to use this natural wealth for the wellbeing of people. Firstly, the productivity of forests in most developing countries is pathetically low. This is partly because it is difficult to plant and cut and then grow again, in the face of enormous human and animal pressure on forestland. So countries plant, but regeneration is low. Secondly, forest protection has come at a heavy cost to local people and the question is how they can benefit from this green economy.

The way ahead involves three steps. Firstly, countries need urgently to value the economic potential of forests and to incorporate this into national accounts. But this valuation must go beyond carbon storage and other obvious benefits. It must take into account the million ways in which forests provide livelihood support to people.

Secondly, countries need steps to pay for standing forests. But most importantly this financing must go to communities bearing the burden of conservation. The economic value of keeping forests as forests for watersheds and biodiversity has to be paid to the custodians. This will build local economies and local support for forest protection.

Thirdly, and most importantly, countries have to increase the productivity of the remaining forestland. But we know that the business of cutting and planting trees that survive cannot be successful without people who live in the forest. In this way, the question of rights over forest resources becomes critical. Countries cannot work on green economy indicators without determining who controls the right to take decisions over the green economy. This is the missing link in our discussions on green growth — green cannot be green without equity and justice.

4 Green Energy: Are Renewables the Question, or Access?

A similar question confronts us when we discuss the matter of goals for sustainable energy — a critical indicator, which measures so much of what our future holds and fears. We know today that the world's energy system — dependent on fossil fuels for driving the engines of growth — is the reason why the world is looking at a climate-uncertain future and catastrophic impacts. This is why the global goal to move towards renewable energy is important. But is this an adequate goal? Does it reflect the current realities of the world, where on the one hand there is profligate use of energy and on the other hand there are millions without access to even a light bulb?

The world has a serious disconnection. The potential customers of renewable energy are among the poorest in the world. But the suppliers of this future energy system do not have the means and methods to reach the inaccessible and the marginalised. The customers of renewable energy are currently not connected to the electricity grid; they have no electricity to light their houses or cook their food. They need economical and feasible sources of energy. Their energy poverty is disabling and needs to be eradicated. It is clear that the introduction of decentralised and improved technologies paves the way to catapult the poorest of households into the most modern systems. It is also an advantage that these technologies — from wind and solar to biomass — provide cleaner low-carbon energy options to combat climate change. These are future systems that are critical for the survival of all. But in the business-as-usual method, poor customers cannot be reached by this energy source. Therefore, how do we design a green economy model that will be energy inclusive and energy sustainable? This is the question.

The fastest penetration of new energy sources is most likely to happen in regions that are still growing in terms of providing basic essentials. Those who are already rich have built their energy infrastructure; they are energy reckless.

They need to move to clean energy because of their massive carbon footprint, which is taking the world down. According to the International Energy Agency (IEA)[2], the growth of primary energy demand in OECD countries is expected to be 0.3 percent annually, while in India it will be the highest at three percent annually between 2009 and 2035. The infrastructure is being built now, and it is most appropriate not to 'lock out' renewable and clean energy.

We also know that the same countries that are ahead in building new energy infrastructure also have the largest number of poor people who do not have access to energy. The IEA global data book also tells us that there is huge energy poverty in the world and that this energy source is still priced higher than conventional energy systems. Here lies the nub of the problem. The poorest need access to what are currently the most expensive systems. This is possible only with massive public-financed programmes that drive down the cost.

It is not as if renewable energy is per se a new venture. The fact is that currently ten to twelve percent of the primary energy supply comes from renewable sources (not counting hydroelectric energy). But new renewables — technologies of the future — still make up only one to two percent of this supply. The rest comes from biomass systems of the poor like the stove that burns wood or cow dung. These are the clients who can now either take the next step on the energy ladder to kerosene or liquid petroleum gas (LPG), or jump to the top of the ladder by moving to modern biomass energy sources. These are the same clients who are in the dark and today have the option of selecting decentralised minigrids for their energy needs. But if these are the people who are the targets of the new venture then business is completely out of touch with its customers.

5 Rethink and Rework the Development Paradigm

The reason is that the renewable business is built on the antiquated model of its predecessor — the fossil fuel industry. It uses the same market principles of scaling up investment in large projects to meet the needs of the market that is connected and price savvy. It has no models on offer to reach the poor, who can pay little to access energy and who need cheap and affordable energy options.

The reason also is that the world, keen on getting green points, has not created the mechanisms to build this true-green economy. Yet it is well under-

2 International Energy Agency (2011): World Energy Outlook 2011. Paris: OECD/IEA, p. 81.

stood that the transition to low-carbon growth will need massive investment in new renewable technologies and in distribution systems that reduce the cost of transmission, reduce losses and make societies more resilient. The challenge is compounded by the fact that large numbers of households in the world remain energy-deprived and energy-insecure. The world has to find energy options that are both affordable and sustainable. The transition to low-carbon energy futures can be financed through a global feed-in tariff mechanism, which would pay for the differential cost of generating more expensive energy using renewable technologies. Many countries have adopted domestic feed-in tariff regulations. Germany, where consumers of energy are relatively wealthy, requires power utilities to pay the differential. In India, where energy insecurity and energy costs are already high and consumers are poor, the approach is to bundle cheaper energy with more expensive energy to bring down prices. These are all approaches that will make us learn the options for the future. The world needs to create a mechanism whereby high-energy users in the industrialised countries are charged for funding this transition in the emerging world. But this will require more than just glib green goals. It will require investment in making the green goals a real possibility.

In this situation, what should be the goal for a green economy? Should the world measure its success in terms of renewable energy or should the world measure its success in terms of providing energy to the poorest. The goals are compatible, but not without a clear policy. Providing renewable energy to the poorest in the world will require doing business differently — at the national and international levels. This is where the world needs to rethink goals from reality.

The imperative of the future is clear. The world has to seriously rethink and rework its development paradigm for the future to make itself less economically vulnerable and more climate-secure. It is now increasingly evident that the only way to break this vicious cycle of growth-consumption-wealth-waste is to change our fundamental understanding of what constitutes growth, what leads to happiness and what results in employment and wellbeing for all. It would mean changes in how we measure economic growth — discarding or going beyond the gross domestic product (GDP) indicator to one that is much more comprehensive in assessing these needs. It would also mean changing the business of business so that the pathways to growth are reinvented.

Building a Low-Carbon Society – Learning from the Past

by Prof. ***Dirk Messner*** *(DIE/WBGU)*

In the coming forty years greenhouse gas emissions will have to be reduced by more than 50 percent globally and by some 80 to 90 percent in the member countries of the Organisation for Economic Co-operation and Development (OECD). The emerging economies, too, will have to stabilise their emissions quickly and then reduce them by 2050 to the level of about one to 1.5 tonnes per annum to which each individual on Earth will be entitled in the mid-21st century, if the goal of stabilising global warming at about two degrees Celsius is to be achieved. Low-carbon development is a strategic element of any effort to build green economies, because global warming is a driver of many processes of environmental degradation: erosion of land and forests, desertification, water scarcity, and acidification of the oceans are only a few examples. Currently, per-capita greenhouse gas emissions in India, Senegal and Vietnam amount to between one and 1.5 tonnes per annum, while China's have already risen to about six tonnes, Europe's to ten tonnes and the USA's to 20 tonnes. The world economy thus needs to be largely decarbonised if dangerous climate change is to be avoided. The focus is on global energy systems, but land use must also be made climate-compatible — because the bulk of emissions come from those areas. There is moreover a need for the enormous surge of urbanisation in global society to be managed with climate compatibility in mind, since urban areas account for 70 percent of energy-related greenhouse gas emissions. The number of people living in urban areas worldwide will double from three to six billion between 2010 and 2050; in Asia the population living in cities will rise from 1.5 to three billion between 2010 and 2030. A further goal must be to increase energy efficiency significantly in all sectors of the economy and to 'invent' climate-compatible consumption styles.

The German Advisory Council on Global Change (WBGU)[1] considers only two great transformations, waves of change or civilisation phases, in the history of humankind to be comparable to the great transformation towards a global low-carbon economy faced now: the Neolithic Revolution, i.e. the transition from hunter-gatherer to agricultural society (Winkler 2009), and the Industrial Revolution, already referred to as a "Great Transformation" by the Hungarian economist Karl Polanyi (1944). OECD economies as well as emerging economies and developing countries should therefore try to learn from past experiences.

1 Taking a Historical Perspective: the Industrial Transformation in the 19th Century

In his 1,500 page treatise *Verwandlung der Welt – Eine Geschichte des 19. Jahrhunderts* (*Global Metamorphosis – a History of the 19th Century*, 2009), the historian Jürgen Osterhammel describes the great transformation which led to the industrial society. He analyses the period from 1770 to the 20th century. Instead of a transformation, he refers to the phase of intense change from agricultural to industrial societies he observes in "the five or six decades around 1800", which he variously refers to as the "Schwellenjahrzehnte" — the decades of emergence, the "Epochenwandel" — a time of epochal transition, "Sattelzeit" — a time of historical discontinuity, or "Wendezeit" — the turning point (Osterhammel 2009). Osterhammel concludes that great epochal transitions leading to a "global metamorphosis" last several decades. In these phases of "Übergänge" and "Zäsuren" (transitory and incisive change), economic, cultural and social, as well as ecological processes progressing at different speeds (Braudel 1958) become more concentrated to gel into transformative dynamics, influenced by a great number of actor groups which ultimately, albeit with potentially differing intentions, advance the change in a specific direction (Osterhammel 2009).

History therefore knows no clearly definable temporal evolutionary tipping-points heralding an epochal change. Historical waves and comprehensive transformations are actually the result of "Häufigkeitsverdichtungen von Veränder-

1 The WBGU is an interdisciplinary scientific advisory body of the German government. It carries out independent research and advisory work on aspects of global change (www.wbgu.de). This text is based on: WBGU (2011): *World in Transition. A Social Contract for Sustainabilty*, Berlin. The author is the Vice Chair of the WBGU (http://www.wbgu.de/en), Director of the German Development Institute (http://www.die-gdi.de/en/) and Co-Director of the Centre for Advanced Studies on Global Cooperation Research (www.gcr21.org).

ungen", "a concurrence of multiple changes, which can either be an ongoing process, or take place with interruptions; they can occur either additively or cumulatively, either reversibly or irreversibly, either at a steady or an unsteady pace" (Osterhammel 2009, ad hoc translation by the WBGU). Only ex-post analysis reveals whether an epochal change, as in the transition from the era of agricultural to the era of industrial societies, has taken place.

The non-linearity of far-reaching social transformations becomes particularly apparent in the non-parallelism between the history of ideas and real political changes. A look at history shows that considerable time passes before radical ideas and new guiding principles permeate societies to ultimately lead to great changes. John Locke (1632–1704) argued for Enlightenment and Reason for the entire second half of the 17th century. French philosopher René Descartes (1596–1650) established the French rationalism expanded later by Voltaire (1694–1778) and Rousseau (1712–1778). Kant's famous essay *An Answer to the Question: What is Enlightenment?* in which he demanded "man's emergence from his self-imposed immaturity", was published in 1784. Whilst the philosophers of the Age of Enlightenment advocated liberty, reason and the "welfare of humanity", and "preconceived" democratic societies, their own societies were still dominated by the counter-enlightenment philosophies propagated by either the Catholic or the Protestant Church, depending on locality. In either case, they were living a life still far removed from the new ideals of the Enlightenment. New concepts and ideas do not translate immediately into societal change. They need time to be absorbed in their societies. In this respect, the concept of Enlightenment and the concept of Sustainability follow very similar trajectories.

2 Fossil Energy as the Driver for the Industrial Revolution

Like the low-carbon transformation, the process of industrialisation was above all an energy-regime change (Sieferle et al. 2006). Until the late 18th century, pre-industrial societies were based on a limited range of energy sources other than manpower. Water, wind, firewood, peat and beasts of burden limited the economies' productive capacity and ability to expand. The worry that energy availability might not keep pace with population growth was ever-present. The 'Malthus Controversy', instigated by his *Essay on the Principle of Population* (Malthus 1798), testified to these worries, and became embedded in the historical memory of many generations.

Around 1780, all global societies depended on the use of energy from biomass. A good century later, at the beginning of the 20th century, the world was divided into a small group of industrialised countries, where the expansion of infrastructure for the use of fossil energy carriers had succeeded, and a majority of nations which were forced to continue to rely on traditional energy sources. The energy-regime changeover in these industrialised countries was by no means sudden. The "era of fossil fuels" (Osterhammel 2009) commenced around 1820. During this phase, per capita income, previously stagnant over a long period, also grew. The substitution of animal and human muscle power, and wood and peat, with energy stored in a fossil fuel (coal) revolutionised the economy.

Coal drove steam engines, ships and railways, and catapulted the industrialising societies into an era of interconnectedness, acceleration and national integration. As late as the middle of the 19th century, coal provided only a small, but steadily rising amount of the energy used, even in Europe. The history of crude oil began in Pennsylvania in 1859, when it was first extracted commercially. It took around seven decades for mineral fuels (coal and oil) to overtake biomass in global economic importance, even though the majority of the global population remained reliant on traditional energy carriers by the end of the 19th century.

The predominance of a fossil-energy regime (particularly in Britain, Germany and the USA) from the 1880s led to a second generation of industrial innovations that were based on the new energy carriers: electricity (light bulb, electric motors, power station technologies), chemicals and the automobile. The energy revolution therefore triggered a complex, self-contained innovation cycle. This was accompanied by other innovations, such as radio transmission (1895) and cinematography (1895).

The transformation into the "fossil-energy century" was not only a process of economic and technical transformation. Energy became a "cultural leitmotiv" (Osterhammel 2009). The links between science and industry became closer, and the age of large-scale industrial research began. The scientific organisations "invented the method of invention" (Alfred North Whitehead, from Osterhammel 2009). Commercially successful inventors such as Werner Siemens, who discovered the electro-dynamic principle in 1866, and Thomas Edison, who investigated electricity generation and distribution, helped to shape the founding years of Germany's Wilhelminian era. Fossil energy carriers completely altered the way humankind saw the world, as people were no longer forced to depend on elemental natural forces, particularly in the form of fire. With the steam engine, fossil fuels released previously unimaginable force, enabled whole new applications,

increased the productivity of manpower in the emerging industry and in agriculture, and, thanks to the railway, allowed acceleration and geographical interconnectedness.

These changes also affected business sciences and economics. In the middle of the 19th century, Karl Marx referred to industrialism and capitalism as new social structures; in 1848, John Stuart Mill outlined the various approaches of traditional political economy in his comprehensive synthesis *Principles of Political Economy*, which became the analytical foundation for an economy in which industry was replacing agriculture as the leading sector. These changes also resonated in art and philosophy. Around 1830, the heyday of philosophical idealism and romanticism in European, and particularly French, German and English literature, came to an end. European painting underwent a transition towards realism.

3 What Makes the Low-Carbon Transformation Special?

In comparison with the "global metamorphosis" in the 19th century, the Great Transformation towards a global low-carbon economy is distinguished by three additional peculiarities:

Firstly, the fact that the industrial society achieved predominance as the norm was an evolutionary process, for which there was no 'master plan'. The transformation into a sustainable society, on the other hand, must occur intentionally and under time pressure, to achieve a trend reversal towards a climate-friendly and resource-efficient society. There will be no sustainability turnaround without major, strategically targeted efforts by policy-makers, social actors and economies. This is the first great transformation in the history of humankind that has to be consciously effected on the strength of politics and policies.

Secondly, the Great Transformation must take place at a global level, and be embraced by industrialised, newly industrialising and even poor developing countries, as otherwise dangerous climate change cannot be avoided. The Industrial Revolution initially took place in only a few countries, and it took more than a century for it to become an (almost) global phenomenon. Now, the course towards a sustainable global economy must be set within a very short time in order to provide prosperity, stability and security within the planetary boundaries for as many people as possible. This requires an unprecedented level of global cooperation (Messner 2011).

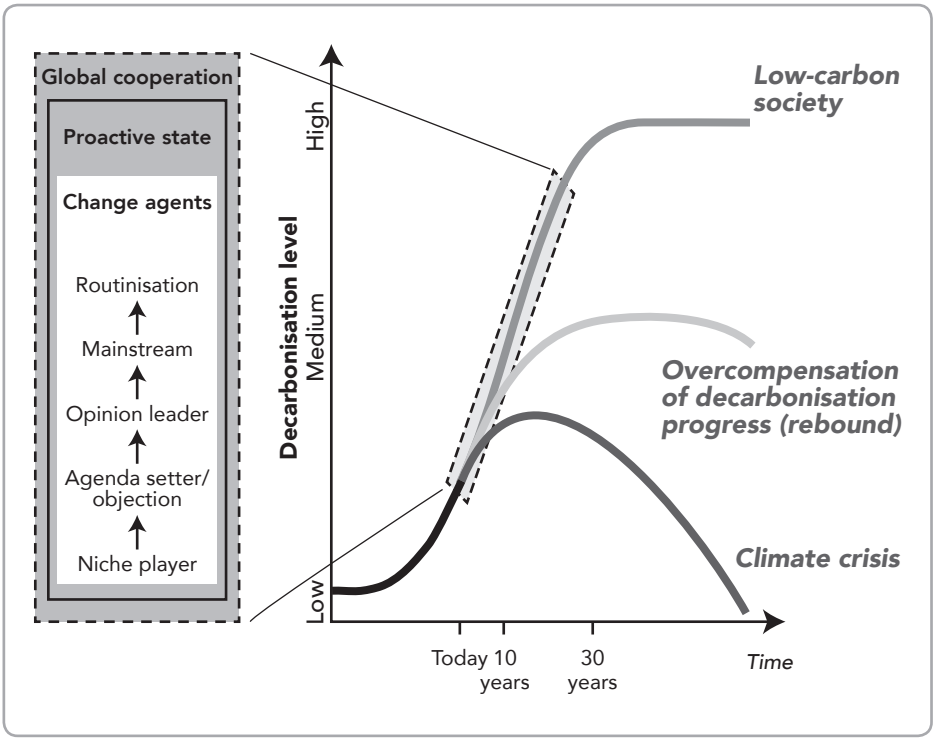
Thirdly, the narrative, the guiding principles of social development, must undergo some radical changes. Although the core ideas of the Enlightenment can, on the one hand, serve as inspiration — for example that reason, a sense of responsibility and consideration of other people's interests guide all our actions — it must also be generally accepted that the planetary boundaries should now serve as the starting point of all social development and prosperity increase (re-embedding societies into the Earth System). The primary motive of the era of industrialisation, on the other hand, was to overcome the boundaries set by nature (dis-embedding). This is not a petition for a romantic return to nature, and not an outright rejection of technological solutions for humankind's future challenges. However, whichever development path is chosen, it must take the boundaries of the global ecosystems into account — as otherwise, the Earth could well become a barren and unsafe place in the course of the 21st century.

These three specific characteristics of the Great Transformation indicate that humankind is facing an evolutionary leap for civilisation (as it did during the transition into industrial societies) if the radical change into a low-carbon society is to succeed. Firstly, humankind must prove that it is capable of shaping and directing this major upheaval, and this can only be achieved on the basis of thinking and acting from an extremely long-term perspective. Secondly, it must foster an unprecedented culture of global cooperation. Thirdly, it must also forge a sustainable and legitimised narrative that serves prosperity, security, liberty and fairness in a global society of soon-to-be nine billion people, and that will accept the boundaries of the Earth's ecosystems.

4 The Low-Carbon Trajectory

Grin et al. (2010) illustrate the various stages of a transformation by means of a simple S-curve (Figure 1). Their multi-stage concept helps to describe the basic pattern of transformative change. Transformation progress is determined through the pace of the changes, the scale of transformation, and the stages of the transformation process. Applied to the transition towards a climate-friendly economy (from a high-carbon to a low-carbon economy), the following picture emerges: the transition from industrial to low-carbon society is, just like the change into an industrial society at the beginning of the 19th century, not a rapid process, as the established economic and social model is initially stable, legitimised through successes in terms of prosperity, and therefore resistant to

Figure 1: The transformation trajectory



Source: Based on Grin et al. 2010

change. However, since the 1970s critical voices, at first marginalised, have been raised, questioning the sustainability of the established model (Meadows et al. 1972). So, before the accelerated transitional stage commenced (roughly since the beginning of the 21st century), within the scope of the previous model, the dynamics of change already became apparent (initial steps include the establishment of ministries for the environment in many countries, environmentally oriented movements emerging, the Report of the World Commission on Environment and Development (Brundtland Report) published in 1987; the United Nations Conference on Environment and Development (Rio conference) in 1992). Taking this perspective, the transformation towards sustainability already started around four decades ago, with changes that were initially incremental.

The change from the acceleration of the transitional stage (start phase) to a new social and economic balance and a low-carbon and resource-efficient econ-

omy will probably take another two to three decades. This phase is not marked by linear change processes, but by difficult restructuring processes, by the necessity of more rapid and widespread reforms to overcome path dependencies, by chaotic and uncertain changes, and dynamics in different action fields which can trigger positive as well as negative feedback loops. The steep progress of the curve symbolises that this major break must be achieved in spite of a great number of blockade mechanisms and forces doggedly clinging onto the status quo.

Today, the European economies, but also countries like China and Brazil, are in the thrall of this difficult acceleration process. Now, the right course towards sustainability must be set within the next 10–15 years. This situation can be compared to the 1830s to 1840s of the industrialisation era, during which period the new energy system slowly spread. Its progress was accompanied by innovations, although these dynamics only extended to part of the economy and society, showing that the transition to a new balance can also lead to failure. During the acceleration process, the risk of lock-in patterns is high (see the yellow trajectory, Figure 1). The energy efficiency of vehicles is improved, however, it is concurrently overcompensated by the even faster growing number of cars worldwide (rebound effect). States around the world agree to the reduction of greenhouse gases and other 'green reforms', however, their commitment is far below the level required to avoid dangerous climate change. As a result, global emissions are still rising from year to year. Renewable energies are increasingly important, yet so far they only serve to complement the still dominant fossil energy carriers. This lock-in path leads to a "3–4 °C world" (WBGU 2011).

Europe and the global economy are currently at this critical point. Things have already started to move towards low-carbon development. Nevertheless, there is still a high risk that the current dynamics between the forces of change and the forces of dogged insistence on the status quo will ultimately end in lock-in. It is even conceivable that, despite the fact that tendencies towards a transformation in favour of sustainability have already progressed for some time, there could be some serious setbacks. The USA, for example, might reject the low-carbon change on principle, or the majority of the most populous, and currently rapidly growing, newly industrialising countries (China, India, South Africa, Indonesia) with their own coal reserves, might decide to continue to use these, thus seriously impeding the transition towards a low-carbon society.

5 Eroding Legitimacy of High-Carbon Development – Low-Carbon Concepts Gaining Importance

A number of new studies are showing that a low-carbon global economy is technologically possible (McKinsey 2009, EU COM 2010, UNEP 2011, GEA 2012, OECD 2012). Seen from these perspectives, the transformation to climate compatibility appears to be entirely a question of the relevant actors having the political will. The 'technology assessment perspective' overlooks the fact that the Great Transformation to sustainability represents a comprehensive societal change occurring in different arenas of national societies, and also globally. If such a major change is to succeed, power must shift towards change agents, and there must be cognitive models, concepts and narratives that at least permit a realignment of the economy and society. Transformation must be legitimised by society, and successful examples of climate-compatible investment — demonstrating that climate-compatible development is technologically and economically feasible — must be gradually disseminated. I argue that the main elements that will permit the transformation to be made to climate compatibility are to be found on the playing field that has emerged since 1992. The concept of sustainability first appeared on a major international stage during the 1992 Rio conference, but it was confronted by a stable high-carbon system. Initially, the sustainability discourse remained a niche discourse that had little influence on governmental policies, corporate investment strategies or people's political attitudes and preferences. The number of change agents was small, and their power was limited. The 1992 Rio conference was thus an early stage in the transformation to sustainability; it did not constitute a radical transition. The old development model was challenged intellectually, but a new development path was de facto still a long way off; the technological, political and institutional foundations it needed had yet to be laid.

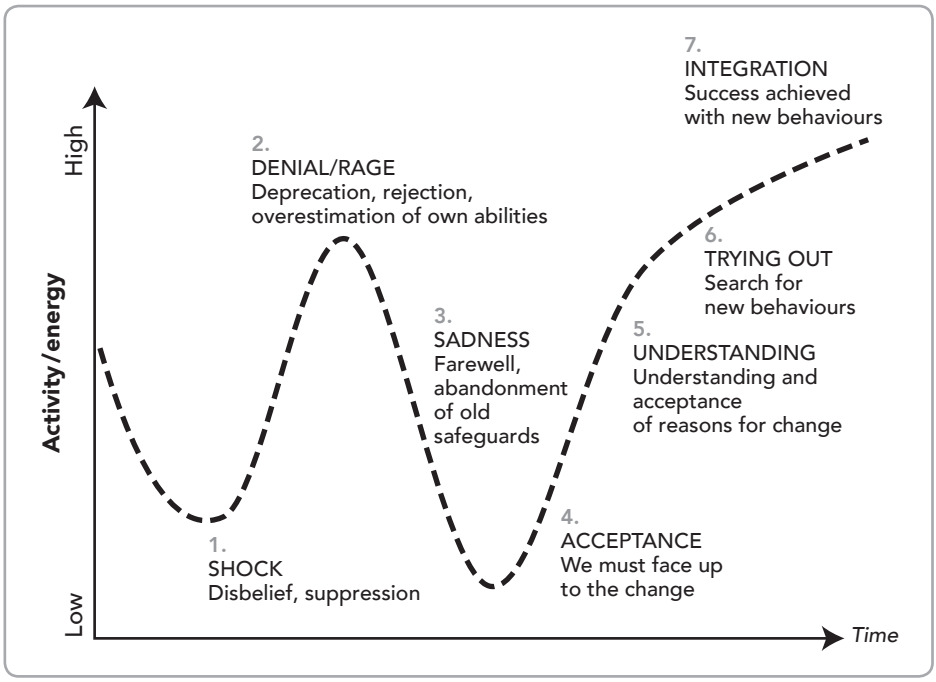
6 Co-Evolution Between Old and New Development Paradigms – a Tipping Point Constellation

20 years later, at the beginning of the second decade of the 21st century, the once niche discourse on sustainability has become a widespread pattern of perception that permeates politics, the economy and society in many countries (WBGU 2011). The legitimacy of the established high-carbon regime has suffered radical erosion in recent years in many societies. That the fossil-fuelled growth model has no future is hardly disputed these days, not even, as a rule, by the protagonists of greenhouse-gas-intensive companies, sectors or economies. The proponents of the old development paradigm have gone on the defensive, they try (at international climate conferences or in the context of national reform processes) to delay the transformation to a post-fossil-fuel economy, they argue for the protection of their interests, whose legitimacy is under pressure, and they advocate greenhouse-gas emission reduction targets that are 'realistic' (i.e. as undemanding as possible).

The change in the basis of legitimation is not a sudden, but an ongoing and non-linear process. Figure 2 shows phases in processes of change occurring in companies and organisations (Meifert 2011). This division into phases of change helps to illustrate the process of transformation to climate compatibility. The questioning of the old growth model in *Limits to Growth* (Meadows et al. 1972), for example, was initially rejected and stigmatised as a naive world view (Phases 1 and 2). The 1987 Brundtland Report and the 1992 Rio conference confirmed the core criticisms levelled at the established growth paths. They enjoy a considerable degree of recognition (Phase 2 and 3: from denial to abandonment of old safeguards), but are not yet able to replace the old growth concept. The 2007 Stern Report on the cost of climate change and the 2007 IPCC Report have resulted in many companies and governments throughout the world accepting that fossil fuels really do not have a future as the basis of the world economy (Phase 4). Yet the changes are certainly not occurring synchronously at international level.

While such countries as Russia and many actors in the USA are still between Phases 2 and 4 (rejection, overestimation of their own abilities; abandonment of old safeguards; acceptance of pressure for change), the 12th Five-Year Plan launched by the Chinese government in 2011, in which energy efficiency and low-carbon development play a central role for the first time (Wang et al. 2012), may indicate that the decision-makers have opted to take up the challenge of cli-

Figure 2: Phases in processes of change (of organisations)



Source: Meifert 2011

mate-compatible transformation (Phases 5 and 6). Germany's ambitious change of energy policy, which now provides for the renewable share of energy generation to rise to 40 percent by 2020 and to at least 80 percent by 2050, is in itself a proactive transformation strategy (Phases 6 and 7).

Despite these dynamics of change, the erosion of the legitimacy of the old growth model, globally and in the national economies, is not yet so far advanced, nor is the development of the legitimacy of the new development path yet so manifest, that the transformation to a low-carbon development path can be considered a foregone conclusion. Instead, the old and new development concepts often co-exist. I describe this co-existence as a process in which tipping-point situations arise between 'the old' and 'the new'. Interestingly, dynamics that point in the direction of transformation to climate compatibility are emerging, not only as a result of external low-carbon innovators (as in the context of the 1992 Rio conference), but in the established institutions themselves. This greatly improves the chances of transformation.

Tipping-point constellations can be observed, for instance, in the following areas: the World Bank continues to have strong departments and actors who support the fossil-fuel-based development model and obstruct the transition to a low-carbon economy, while the promoters, programmes and investment pledges that endorse the efforts to achieve climate compatibility are steadily gaining in importance in parallel. In many established companies (in the automotive, chemical and energy industries) small CSR departments that once looked into the environmental effects of the 'core business' have grown into strong green innovation divisions. Within the same companies the established 'fossil-fuel-based corporate fields' are now confronted by departments that are planning for a green future and gaining in strength. In international development policy there are signs of a similar tipping-point constellation. While the Seoul Development Consensus adopted by the G20 in 2010 is largely guided by the old growth concepts, the same governments have been discussing the transition to the 'green economy' in the context of the United Nations Conference on Sustainable Development in 2012 (Rio+20). And in many societies the challenges posed by the transformation to climate compatibility are no longer being fought out between 'green' and 'conventional' parties, but within parties across the whole political spectrum. The transformation dynamic has thus migrated from the low-carbon pioneers outside the high-carbon mainstream to the centre of the economy and society, thus increasing the potential for climate-compatible transformation.

7 The Great Transformation Is Possible… But By No Means Certain

It is impossible to predict whether the dynamics that have been outlined will eventually merge into an irreversible low-carbon transformation. We have been analysing shifting development discourses and we have been arguing that low-carbon technologies, low-carbon policies, and low-carbon investment are gaining importance in many economies. These different dynamics interact and may reinforce each other. The change of discourse to sustainability is increasing the legitimacy of policy reforms aimed at boosting low-carbon transformation. The Rio+20 conference, with its all-in-all disappointing results, might have contributed to this shift of discourse. The dynamics of low-carbon innovation are reducing the cost of transformation and increasing the number of change agents who

endorse the structural change. The rising number of low-carbon change agents is improving the chances of path dependencies being overcome. Cross-frontier low-carbon alliances are facilitating the emergence of local reform alliances — and vice versa. From a certain point, a cumulative process with its own dynamic may occur: transformation nurturing transformation. Statisticians argue that such "high-order interactions" result in major changes (Eisenberg 2011).

The power of interacting dynamics of change in societies is thus greater than the sum of their parts (Messner 1997). Grin et al. (2010) referred to this as co-evolution. The low-carbon transformation is not an "event," not a "battle," but a process that Osterhammel (2009, p. 115) summarised in his analysis of the metamorphosis of the world in the 19th century as "a concurrence of multiple changes". In the following quotation Osterhammel describes the complexity of these processes of change during the Industrial Revolution. We insert in parentheses examples from our analysis of the current low carbon transformation:

Overlapping or mutually reinforcing changes may proceed "continuously or discontinuously *(e.g. continuous technological low-carbon learning processes; discontinuous climate-compatible reform processes in different countries at different speeds and at different levels of ambition)*, additively *(low-carbon reforms in various sectors of the economy or companies)* or cumulatively *(e.g. through the introduction of emission-trading that has an impact on many sectors)*, reversibly *(e.g. policy reforms)* or irreversibly *(climate-compatible innovations and learning processes that increase the range of options)*, at a steady or unsteady pace *(real transformation processes in different countries or sectors)*. There are repetitive processes *(climate negotiations)* and unique processes of a transformative nature *(Fukushima accident causes Germany to abandon nuclear energy)*. Of particular interest among transformative processes of this kind are those which play out causatively between different category fields, […] environmental impacts change social structures or impacts of attitudes change […] economic behaviour." (Osterhammel 2009, p. 115)

The analysis by the historian Osterhammel can also be translated into the language of the theory of complex systems: "Coevolution allows the evolving entities to 'challenge' each other progressively. By slowly, and automatically, ramping up the challenges, rapid evolutionary progress becomes possible. […] Coevolution allows the system to achieve previously inaccessible ends." (Miller & Page 2007, pp. 237–238)

Our conclusion reads: the empirical processes of change, as we have outlined them, have the potential to give rise to dynamics, trends, shifts of power, learn-

ing processes and capabilities which, when combined, afford new opportunities for action to be taken for society and the economy and permit a change of path to climate compatibility.

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Jobs and the Green Economy

by **Michael Renner** *(Worldwatch Institute)*

Many non-governmental participants in the United Nations Conference on Sustainable Development (Rio+20 conference) travelled to Brazil fully aware that a much-needed breakthrough in international environmental policy-making was unlikely to materialise. Even so, it was still easy to come away disappointed from the gathering, given the lack of concrete commitments, and a final conference text, *The Future We Want* (United Nations 2012), that among other topics talks extensively about energy, transport, sustainable cities and human settlements, and full and productive employment, but ultimately offers little beyond uninspiring generalities. Transportation was one of the few exceptions, given that a major boost in spending on alternative transportation modes by multilateral development banks was announced at the Rio conference.

While planned as a 20-year commemoration of the original Rio conference, the timing of Rio+20 could not have been more critical, in view of the tremendous dual economic and environmental crisis. New concepts such as 'green economy' and 'green jobs' had emerged in recent years. Proposals for a Green New Deal even had the trappings of a new social contract. These concepts are variously — and somewhat incongruously — seen as a potential new engine of economic growth or a means to build an economy not in thrall to gross domestic product (GDP) worship; a lofty strategy to eliminate persistent poverty or a tactic to gain competitive advantage.

While these terms have gained currency in the public discourse, their precise meaning remains disputed, with different interpretations prevailing among governments, corporations, and civil society groups. And because their socio-eco-

nomic circumstances and needs vary so widely, industrial, emerging, and developing countries all have different conceptions of what exactly a green economy entails, and how to get there.

1 The Promise of Green Jobs in Emerging Economies

In fact, some observers in emerging and developing economies worry that green economy prescriptions could be used to justify a 'green protectionism' blocking their developmental aspirations (UNDESA 2011). The countries that are not members of the Organisation for Economic Co-operation and Development increased their share of global GDP (measured on a purchasing-power parity basis) from 40 percent in 2000 to 49 percent in 2010, and this may reach 57 percent by 2030 (OECD 2010). This economic expansion has improved the lot of many people. The share of population earning less than 1.25 US dollar a day (in 2005 prices) dropped from 84 percent in 1981 to 16 percent in 2005 in China, from 17 to eight percent in Brazil, and from 60 to 42 percent in India (Ravallion 2009).

Yet present policies leave emerging and developing countries increasingly at risk from climate change and other forms of environmental breakdown. Saleemul Huq (2011) of the International Institute for Environment and Development argues that emerging economies hold the key to a green economy. They are not as locked into a fossil-fuel-dependent economy as Western industrialised countries, they are in a much more dynamic situation that allows them, in principle, to leapfrog to greener technologies and structures. They also have greater economic wherewithal than poorer developing countries do.

Ensuring more sustainable and equitable provision of energy, transportation, housing, and waste management — four key sectors of the economy that are discussed below — would not only substantially improve the health and quality of life of billions of people but also significantly reduce ecological impacts. And doing so would generate much-needed employment.

In efforts to green the economy, much of the attention is typically directed towards public and private policies to facilitate technical innovation and investments. However, employment — preferably at adequate incomes and under safe working conditions — is key to making an economy work for people. No economy can function properly without well-trained and skilled people, and without giving people a sense of purpose, dignity, and hope for the future. This is especially critical in an economy focused on delivering efficient, quality products

and services while protecting the environment. However, much employment in emerging and developing countries is in the so-called informal sector, where earnings are often low and unstable, and where workplace protections are often unheard of. As the discussion below suggests, the greening of jobs must also go hand in hand with an improvement in social conditions.

1.1 Energy

Energy use pervades virtually every human activity on Earth, and the heavy reliance on fossil fuels is a major culprit behind urban air pollution and climate change. Emerging countries face a two-fold challenge: their expanding economies use rapidly rising amounts of energy, a demand often satisfied by coal. At the same time, many people in rural areas still contend with pervasive energy poverty.

Renewable sources of energy offer an increasingly attractive alternative that is not only low-carbon in nature, but also helps to cut down on the deadly indoor pollution that many poor people contend with because of their heavy reliance on fuelwood and kerosene. Renewable energy sources also tend to be more job-intensive than the already highly automated, mature fossil fuel industry (UNEP 2008).

Renewable energy is expanding fast. From just 7 billion US dollar in 1995 and 45.1 billion US dollar in 2004, global investments surged to 278.8 billion US dollar in 2011 (REN21 2005, UNEP et al. 2015). However, investments dropped in the next two years, and, at 270.2 billion US dollar in 2014, remain below the 2011 peak (UNEP et al. 2015) Worldwide, the estimated number of direct and indirect jobs in the renewable energy sector has risen from 2.3 million in 2007 to 7.7 million in 2014 (Renner et al. 2014, IRENA 2015). These numbers are bound to grow in coming years and decades, and emerging economies already play an important role.

China has transformed itself into a leading manufacturer of wind turbines, solar photovoltaic panels, solar water heaters, and biogas digesters, and has an estimated 3.4 million jobs. India's Suzlon is one of the top wind energy companies and the country has kicked off an ambitious solar energy mission. There are now at least 437,000 renewable energy jobs in India. Brazil is the second-largest producer of biofuels, with more than 900,000 jobs (IRENA 2015).

Biofuels development continues to be highly controversial, given disagreements over their net carbon benefit, food-versus-fuel tradeoffs, and concerns that small farmers may be driven off their land in the pursuit of large-scale bio-

fuels development. Cultivating sugar cane, palm oil, and other feedstocks for biofuels requires large numbers of workers, although increasing automation is leading to job loss. The work is typically strenuous and often dangerous. Most of the labourers are unskilled. There have been efforts in Brazil to ameliorate conditions that had historically been deplorable. Work in the distilleries tends to be much better paid (UNEP 2008, ILO 2012).

Other emerging economies still lag behind in their development. South Africa, for example, has tremendous wind and solar potential, which it is only just beginning to develop. The country launched its Green Economy Accord in November 2011, aiming to create 300,000 new jobs by 2020 in renewable energy, improved cookstoves, and a range of green activities outside the energy sector (South African Government Information 2011).

But even in countries that lack a domestic renewable energy manufacturing industry, there are important job opportunities in sales, assembly and installations, and maintenance. Small solar PV systems already provide power to a few million households in developing countries, and solar cookers and portable lights offer a range of benefits (REN21 2011; Lighting Africa 2008). A report by the International Renewable Energy Agency (IRENA 2012) offers a rough estimate of almost four million direct jobs in off-grid renewable electricity generation that could be created by 2030 if the Energy Access for All scenario from the IEA's World Energy Outlook 2011 (close to 148 gigawatt) is fulfilled.

1.2 Transportation

Emerging economies are increasingly emulating the Western car-centric transport model, even at the cost of badly polluted and congested cities. They are also producing more and more cars. At 22.6 million light vehicles in 2014, China is by far the largest manufacturer worldwide. India (3.6 million), Mexico (3.2 million) and Brazil (3 million) are the sixth, seventh, and eighth largest producers (Couchman 2012).

Efforts to reduce transportation's footprint have principally focused on technology: measures to boost vehicle fuel efficiency, switch to alternative fuels, and develop hybrid and electric vehicles. Yet efficient cars, together with hybrid and electric vehicles, presently account for less than three percent of global sales (Renner 2012).

A number of countries are putting their faith in the development of biofuels. Brazil is now producing almost exclusively 'flex-fuel' vehicles that can run on any

blend of gasoline and ethanol, and plans to convert its entire fleet over the next 20 years or so (ANFAVEA 2011). Meanwhile, more than 80 countries are pursuing a different alternative: natural gas (mostly compressed natural gas, CNG), which burns more cleanly than gasoline. Pakistan, Iran, Argentina, Brazil, and India account for three quarters of the global CNG fleet of close to 13 million in 2010 (IANGV 2011).

But such measures alone are inadequate in the face of growing numbers of vehicles and longer distances driven. Moreover, the pursuit of car-centric transportation systems accentuates social disparities. It renders access to jobs physically difficult and costly for low-income households which have to allocate a disproportionate share of their meagre incomes to cover transport expenses.

Public transport systems play a critical role for sustainability and greater social equity. Ridership in urban transit and intercity rail is rising worldwide, as are investments in these transportation systems (Renner & Gardner 2010). The concept of Bus Rapid Transit systems — pioneered in Curitiba, Brazil, in 1974 — has been spreading to a growing number of cities since the 1990s. At present, 194 cities worldwide are operating Bus Rapid Transit systems with a combined length of more than 5,100 kilometers and 32.4 passengers per day (Global BRT Data, undated).Interest in high-speed inter-city rail is growing around the world, with China the leading force, while Brazil and India are pursuing more modest plans (Renner 2011).

One positive outcome of Rio+20 was the announcement by several multilateral development banks that they would make 175 billion US dollar available over ten years for alternative transportation modes. It signals the beginning of a move away from decades of unsustainable investments in transportation systems (Replogle & Hughes 2012). However, it should be noted that more than half of the bank's funding approvals during 2013 went in support of road projects, thus reinforcing conventional transportation priorities (MDB Working Group on Sustainable Transport 2015).

A shifting transportation policy also means shifts in employment — and that, in turn, requires careful transition and adjustment strategies for the affected workers and their communities. While the automobile industry and affiliated sectors employ many millions of people, relatively few people are today employed in manufacturing rail vehicles. But larger numbers of people already work in operating public transportation systems: more than 7.6 million in urban mass transit and 7.1 million in freight and passenger railways (Renner 2012).

1.3 Buildings

Approximately one third of global energy end-use takes place within buildings (IEA 2010), and under business-as-usual assumptions, building energy demand is projected to increase by 60 percent by 2050 (IEA & OECD 2010). The construction industry also carries great importance as an employer. Worldwide, at least 111 million people find work in this sector. But because many workers are in informal employment arrangements not captured in official statistics, the real figure is likely to be much higher (ILO 2012).

Emerging and developing countries face a dual challenge. On the one hand, greening new building construction is very important, given fast-expanding economies and rapidly swelling cities. On the other hand, existing housing is often substandard. Although the share of the urban population living in slums in the developing world declined from 39 percent in 2000 to 32 percent in 2012, the absolute numbers of slum dwellers have risen to 863 million (UN-HABITAT 2012). Poor households typically spend a disproportionate share of their incomes on energy. Providing more energy-efficient housing, and incorporating renewable energy solutions, can be a tool in the fight against poverty.

Labour-intensive programmes for green construction and building retrofitting could generate large numbers of jobs — in producing and installing more appropriate building materials and greater insulation in windows and roofing, as well as favouring more efficient heating and cooling systems, lighting, and appliances and equipment in buildings. But greening the building sector is not merely a matter of using different materials and technologies. Many emerging and developing countries still fall short of the necessary expertise for green building. In India, for example, more than 80 percent of the construction sector workforce consists of unskilled workers (ILO 2011). Skill-building is essential, which in turn is connected to the need to bring a greater degree of 'formalisation' into the construction sector and improving workers' status and rights.

Social housing programmes can be vehicles for change. For example, Brazil's 'Minha Casa Minha Vida' (My House, My Life) aims to build a total of three million homes for low-income families (Loudiyi 2010). Houses built under the programme have to meet a number of environmental requirements, including rainwater collection and the use of certified timber. Solar water heaters were made compulsory for houses in the southern half of Brazil in late 2010. The International Labour Organisation expects that as a result nearly 18,000 additional jobs could be created in the solar installation industry (ECLAC & ILO 2010).

In Johannesburg, old city-centre buildings were refurbished, upgrading some 2,700 homes. Technologies introduced included solar energy systems, energy-efficient light bulbs, better insulated boilers and water tanks, as well as energy management systems to avoid use at peak-priced times. The project has provided jobs for over 1,000 contractors (ILO 2012).

1.4 Recycling

Because many cities in developing countries have inadequate or no municipal waste collection, large quantities of recyclable materials are recovered by informal waste pickers. An often-cited estimate puts the number of pickers at one percent of the urban population in developing countries (Bonner 2008). Thus, at least 15 million people worldwide derive a livelihood from waste picking and informal recycling. Any numbers, however, are in essence only educated guesses.

Work conditions are frequently hazardous, and earnings are often low and unstable. Moreover, municipal governments all too often regard waste pickers as expendable nuisances, either ignoring them in policy-making or even harassing and persecuting them (Samson 2009).

Forming local and national cooperatives, waste pickers are becoming more organised in fighting for legalisation, improvements in their social status, and better bargaining positions vis-à-vis municipalities and powerful intermediaries. In various parts of the world, the last two decades have seen growing legal recognition and social inclusion of waste pickers (WIEGO, undated). This has brought significant, if still often tenuous, benefits. Earnings increase and become more stable, work conditions improve, as does social welfare (for instance, waste pickers may gain access to health insurance, credit, and housing benefits).

In Brazil, for instance, the 'Movimento Nacional dos Catadores de Materiais Recicláveis'(National Movement of Recyclable Materials Collectors) emerged from years of local organising efforts starting in the 1980s. During the past decade in particular, various pieces of national legislation have offered growing support. Waste picking has been recognised as a legitimate occupation. In 2010, the National Policy of Solid Waste mandated that informal recyclers be included in municipal recycling programmes. The comprehensive national poverty alleviation plan 'Brasil Sem Miséria' (Brazil Without Misery) launched in June 2011 offers training and infrastructure support to waste pickers, and aims to achieve their socio-economic inclusion in 260 municipalities (ILO 2012).

Many challenges remain to making recycling in emerging and developing countries a more green and decent activity. The global economic crisis is affecting the demand and market price for recyclables and compelling more people to rely on waste picking in the face of a lack of formal economy jobs. This may well challenge past accomplishments of waste picker organisations.

Another challenge is found in waste management privatisation efforts in cities around the world that try to sideline informal recyclers. In Delhi, for example, after contracts were awarded to private companies in 2005, recycling rates plunged because contractors were required to separate no more than 20 percent of the waste by the eighth and final year of their contract (SNDT Women's University & Chintan 2008). In Cairo, city authorities awarded contracts to Italian and Spanish companies in 2003, but likewise only required a recycling rate of 20 percent — far below the 80 percent achieved by the city's informal waste pickers (Samson 2009).

Finally, new waste streams — particularly e-waste — expose waste pickers to new occupational and health risks and will require a greater degree of training (to understand how to safely dismantle electric and electronic waste products, for instance) as well as proper equipment — advances that are unlikely to happen in the absence of a greater degree of formalisation of the sector. A large proportion of e-waste is exported to countries such as China and India for dismantling, where recycling is done in informal, often anarchic settings of small family workshops, and safety regulations are difficult to enforce. An estimated 770,000 people are working in China's electronics recycling industry alone (Manhart 2007).

2 Green and Equitable

Green jobs is a convenient term, but the nature of such jobs will vary tremendously by economic sector and by individual country. Green jobs are not necessarily or automatically 'decent' jobs, with regard to wages, work conditions, and the ability of workers in the vast informal sector to improve their conditions and prospects. Effective social dialogue between employers and workers, the right of workers to organise, and efforts towards greater social inclusion are all critical components for ensuring equitable outcomes in the move towards a green economy. Government action is needed to establish and enforce decent wage standards and occupational health and safety rules.

Educating and training people so they can play a role in the green economy is another critical objective. Skills shortages — already evident in the renewable energy sector, could hamper the emergence of a green economy. To avoid this, governments should support a range of training efforts. National skills mapping exercises could be undertaken with the goal of establishing green skill profiles in each industry, identifying strengths and gaps in the existing skills base, and creating a plan for overcoming gaps. Governments can also set up or facilitate the creation of green training centres and can encourage private companies and educational institutions to incorporate green jobs skills into courses, apprenticeships, and other workplace training. They should ensure greater gender balance and access by disadvantaged communities.

Lessons learned need to be shared as widely as possible. More and more countries are eager to learn about the opportunities inherent in greening employment. The United Nations could play a useful role in this context by establishing a Green Jobs Best Practices Unit that offers advice to governments and other stakeholders. Increasing numbers of United Nations agencies, including United Nations Environment Programme, International Labour Organisation, United Nations Development Programme, United Nations Industrial Development Organisation, and others, have become involved in the field of green jobs. Their efforts could be made more effective via an inter-agency coordinating group. Further, an advisory council drawn from experts and stakeholders from business, labour, and civil society could help guide the United Nations' work and analyse key developments, opportunities, and challenges.

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Enabling a Green Economy

by ***Mark Halle*** *(IISD)*

It is hard, on the surface of things, to find fault with the idea of a Green Economy. As defined by the United Nations Environment Programme (UNEP), a Green Economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP 2011). More simply, UNEP invites us to think of a Green Economy as one that is low carbon, resource efficient and socially inclusive. Defined this way, it is hard to imagine that any normal observer without a partisan interest would prefer an alternative. Who would, given the choice, elect for a course that significantly increased environmental risks, undermined social equity, and sapped human well-being?

The answer, of course, is most of us — by choice or by indifference. We have lived with, accepted, and in many cases actively promoted a form of economic organisation that we know full well greatly over-uses carbon, makes wasteful use of both living and non-living natural resources, and that has made social exclusion almost a source of pride. This chapter will explore why so much of humanity continues to act in ways that it knows are destructive, that undermine the future of the societies their own children will inherit, and that render sustainability an ever more remote goal. It begins by examining the pros and cons of a Green Economy approach as contrasted with a sustainable development approach. It stresses the critical importance, in any successful green transition strategy, of an enabling policy framework. And it illustrates this using the examples of financial risk management, subsidies, and public procurement.

The notion of a Green Economy is not new. It has developed over the decades along with the notion of sustainable development, first defined by the Brundt-

land Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, p. 27). Both make the perfectly straightforward point that economic activity must respect certain limits imposed by the planet or by society, or the seeds of destruction will germinate and begin to tear it down. If sustainable development has tended, historically, to focus on environmental sources of social and economic decline, the Green Economy, in its present resurgence, has shifted the focus solidly to the economy itself, underlining a fact that too many environmentalists have missed in their single-minded concern for global trends — that whether or not we reach sustainable development will in the end depend fundamentally on how we organise the economy.

1 The Green Economy as a Response to the Global Financial Crisis

The present interest in the Green Economy stems from the global economic crisis that broke out in 2008. This crisis to a great extent signalled the demise of the neoliberal economic paradigm that had dominated economic thinking since the late 1970s and that took on the force of a powerful ideology with the collapse of the Soviet Empire, leading over-confident observers like Francis Fukuyama to herald "The End of History" (Fukuyama 1992).

History, as usual, had the last laugh. When the overheated economy went off the cliff in 2008, it became clear that the neoliberal model may have delivered fabulous wealth for a handful of financial managers and investors; however, this wealth had been earned at a high price in social marginalisation, loss of employment and accelerated depletion of natural resources. An alternative was urgently needed.

The first to recognise the opportunity in the crisis was UNEP, who set out to craft a Global Green New Deal, an attempt that quickly evolved into the notion of a Green Economy (UNEP 2009). Many others jumped on the bandwagon with their own version and moniker — Green Growth, Green and Inclusive Growth, Responsible Economy, etc. (OECD 2013, World Bank 2012a, World Bank 2012b). While each title carries a set of connotations (Green Growth, for example, carries the aroma of traditional economic thinking and is used so as not to frighten off politicians committed to providing jobs, security, and prosperity to their constituents), at base they all convey the same message: the acceptance

of the irredeemable failure of neoliberal economics and the need to find alternatives that address the importance of employment, social inclusion, and environmental responsibility.

Faced with the collapse of the dominant economic paradigm, and with the cost of social unrest and environmental degradation mounting, the Green Economy should have been welcomed with open arms. Instead, it was received with enormous suspicion and has proved by and large to be as hard to sell as sustainable development itself. Indeed, in the lead-up to the United Nations Conference on Sustainable Development in 2012 (Rio+20) it came close to being rejected by a substantial group of developing countries.[1]

2 Green Economy: the Backlash

The objections revolved around three central arguments:

- moving to a Green Economy would open vast scope for trade protectionism masquerading as green standards;
- the Green Economy transition requires a vast programme of upgrading technology, most of which is patented in the rich countries, leaving the developing countries once again at a disadvantage; and
- the Green Economy further accelerates the 'commodification of nature' and involves accepting a notion that is fundamentally unacceptable.

Certainly the danger of green protectionism is real. Traders are forever seeking ways to achieve competitive advantage in the market place by ensuring that the competition is excluded from the beneficial treatment they ask for themselves. That is why we have the World Trade Organization, set up precisely to guard against that very tendency. There is no reason to think they would be less vigilant, or less effective in dealing with green protectionist measures than with other forms of unfair trade practice, and any change of rules to give green measures more scope would have to be agreed by all members, including those expressing doubts about the Green Economy.

1 The strongest reaction came from the Latin American group and, within that group, from the countries (Bolivia, Ecuador, Venezuela, Cuba and others) in the Bolivarian Alliance for the Americas (ALBA).

The argument around access to technology is also a very solid one, but it triggers two comments: Firstly, the use of greener technology is likely to be good both for production (it cuts down on use of energy and waste) and increases the recipient's competitiveness. Secondly, green technology offers all the side benefits of cleaner production and consumption — less work-time lost to illness, better child and maternal health, less cost of pollution and clean-up, etc. And countries prepared to commit to a rapid transition to a Green Economy can negotiate privileged access to technology as part of the package.

The third objection is more difficult to deal with since it rests on a fundamental critique of modern economic organisation. It posits that respect for life, nature, ecosystems and the planet represent fundamental values and that any attempt to treat biodiversity as a source of natural resources for industry is a violation of those values. Those who hold this view tend to think that the world is on a completely mistaken path, captured by moneyed interests and controlled by corporate forces. The solution is not to find ways to do this more gently, but to abandon the approach entirely. Certainly, this view is incompatible with mainstream thinking on the Green Economy.

3 Rio and the Green Economy's New Dawn

In the end, if Rio+20 failed to adopt the Green Economy with acclamation as the new global economic paradigm, it nevertheless did accept it as a viable option available for countries that wished to embrace it as an essential step in the move towards the broader goal of sustainable development. In view of the fact that the Green Economy transition must take place essentially at the national level anyway, this is all that was needed. The Green Economy transition may now proceed with international approval in all countries that choose this new approach.

Many countries have, indeed, embraced the Green Economy and are resolved to make the transition. Many are middle income or emerging, like South Korea and China. These have invested billions of dollars to move as quickly through the transition as possible. Others have sought to accelerate progress in specific sectors, such as the uptake of renewable energy. And many developing countries have sought the assistance of UNEP or the Global Green Growth Institute to design transition strategies and to identify the key priorities for action (UNEP 2013).

As experience accumulates, many of the advantages of a Green Economy approach begin to become evident:

- A Green Economy must design from the start for social inclusion and for environmental responsibility, and not regard these as an afterthought once economic viability has been established. It was the overwhelming priority given to wealth creation at any cost that tripped up the neoliberal paradigm, and most of the efforts to mitigate the social and environmental impacts were nothing more than patches placed on increasingly threadbare tyres. A blow-out was inevitable.
- Since all economies are interconnected, a national Green Economy must build social equity and environmental responsibility not only domestically but also globally. Thus the building of a Green Economy must involve the narrowing of equity gaps, the fair and respectful treatment of the workforce throughout value chains and a conscious effort not to 'export' environmental problems.
- The Green Economy is fundamentally different from the traditional economy in how it values the protection and enhancement of public goods. Unlike the neoliberal economy, it is not centred on private wealth creation, assuming that benefits for the wider public will flow naturally from private success. Instead, it addresses the public goods of employment, social nets, education, a clean environment and North-South equity first.
- It overcomes the often fragmented economic organisation of the past to look for linkages between sectors, and the need to move to scale with social and environmental actions.
- It forces us to address directly and centrally the choices that must be made between growth (or at least quantitative growth) and sustainability. For far too long we have promoted models based on growth now, sustainability later; or sustainability through growth; or even that growth represents sustainability through technological development. That illusion must be abandoned. We can have growth — indeed we must have in the poorer countries — but only growth that is compatible with sustainability here and now is acceptable, and much of the growth we look for will have to be qualitative, not quantitative.

4 The Green Economy: How to Get There

With the points just set out, we are back to the opening argument: We want, and believe we can have, an economy that delivers the wherewithal to secure widespread well-being while promoting social inclusion and employment, and in the process restoring our ecosystems and our natural resources to a resilient state. It appears to offer the classic triple-win — everything we have always had, plus bonus benefits in the social and environmental department.

We do not yet know how closely this rosy model might be approached in reality because, as hinted above, we do not yet have in place a policy environment favourable to the Green Economy. For the moment, far too many of the incentives and disincentives built into economic activity are unfavourable to the Green Economy. Trying to make the Green Economy transition while leaving these elements in place is like asking someone to swim upstream against a very powerful current. Indeed, addressing the enabling environment should be the first step in the transition simply because, if the present policy framework is left in place, it will virtually guarantee that the transition will fail.

One of the biggest dangers in the Green Economy transition is that its proponents become seduced by their own rhetoric, assuming that their attachment to a better future is the starting point for all those with whom they interact. This is a dangerous illusion; most people are motivated by a complex set of factors that make up their perception of their self-interest, that of their family or community. Few, for example, would choose a path that advanced the good of all if it meant foregoing an opportunity to become fabulously wealthy. Few will pick a bag of coffee labelled sustainable if the price is much higher than the more common brand.

So the transition to the Green Economy will take place only when those responsible are convinced that their self-interest is adequately served by pursuing policies compatible with and supportive of the Green Economy. That is far from being the case at present, as illustrated by the following three examples.

4.1 Financial Risk

The transition to a Green Economy is an investment challenge. We must replace resource-wasteful industrial processes on a massive scale, replace vehicles with fuel-efficient ones, invest in public transport, install renewable energy technol-

ogy, and much, much more. To do so will require a mobilisation of capital on a large scale. The Green Climate Fund alone is seeking to raise and spend 100 billion US dollar a year on actions to mitigate climate change in developing countries (Parnell 2012). Estimates by the International Energy Agency of the amount of investment needed to offer energy access to all by 2030 edges on one trillion US dollar, and considerably more if we opt for clean energy only (IEA 2012). The cost of retrofitting existing buildings to cut down on energy loss is also colossal.

Anything that is necessary and whose cost is high should in theory represent an excellent business opportunity, but in reality things work differently. Bilateral investment agreements, for example, may punish countries that put in place policies favouring renewable energy because these policies run contrary to the interest of foreign investors who have invested in conventional energy like coal or thermal. In the worst cases, such policies might be deemed actions tantamount to expropriation, and the country may be obliged to compensate the conventional investor. Even the risk of this happening can cause a strong chill effect on renewables investment.

Even where that risk is not present, investors will nonetheless shy away from profitable investment in clean energy if they think that the prospects of quick returns are better in conventional energy than they are in renewable energy, or that they are better in another sector entirely. The way capital markets assess investor risk has little or nothing to do with the priorities of national policy.

And often these national policies in one area are undermined by standing policies in another area. An investor keen to place capital in a renewable energy project may be put off by the country's energy price regime, or the monopoly on energy distribution, or the poor state of the national grid.

So, unless these enabling conditions are addressed, the country in question may well set a course towards a Green Economy, only the investors will not follow and, without investment, it is unlikely that the transition will take place effectively and quickly. Countries that start by examining the range of their domestic policies to ensure they are 'investment grade' may find that the transition works much more smoothly. In the end, however, a Green Economy will probably follow, not precede, a profound recasting of the rules governing the financial sector.

4.2 Subsidies

Subsidy policy continues to act like a boulder in the narrow path of progress towards a Green Economy. It is often said that a Green Economy is all very well, but that it is a luxury. UNEP's analysis suggests that there may be higher initial costs in the green scenario but that these costs are quickly offset by net gains (UNEP 2011). But the costs are more than offset by public expenditure that is currently undermining the Green Economy.

Globally, energy subsidies approach the one percent of global gross domestic product (GDP) that Lord Stern suggested might be needed to stabilise atmospheric carbon at 450 parts per million (Stern 2006). The great majority of those subsidies are spent in ways that undermine the Green Economy. For example, some 400–450 billion US dollar is spent on incentives to choose carbon-based fuels over the alternatives. This means that the playing field is skewed against renewable energy to the tune of well over one billion US dollar a day! World Bank figures show that this money is not even going to the poor but is largely captured by the richest 20 percent of citizens in the countries where it is provided (World Bank 2012b). It is safe to say that the same sums spent on the Millennium Development Goals would be sufficient to see them to full implementation. Spent on climate mitigation, it would provide many times over the financial target estimated by the international community as needed to prevent climate disaster.

In short, we are spending to undermine climate action the funding necessary to address our needs at the global level. With such incentives in place, a serious move towards a Green Economy appears idle. Addressing subsidy reform in general, and especially subsidies for the consumption of fossil fuels, is a high priority if we are to put in place a policy framework favourable to the Green Economy transition.

4.3 Procurement

It is often said that we will move to a Green Economy only when the consumer public insists on buying only goods and services that meet approved green standards. Encouraging progress has indeed been made in this respect, with green, organic, fair trade and other sustainability labels carving out small but growing market share. But progress is far too slow, and covers far too small a range of products and services to make a real difference. While we must con-

tinue to try to drive these examples to scale — we would be foolish to count on consumer demand alone to change markets.

That said, we do have a very good way to change markets available to us: public procurement. The public sector represents a significant part of markets worldwide, as much as 15–20 percent of GDP (Lamy 2011). On average, public procurement is running at around 23 percent, though the figure is much higher in key countries such as India, China and Brazil (OECD 2011). For the private consumer to adopt new behaviour requires education, information, and often a serious shift in culture. For governments it can require little more than a decision. Further, markets respond to 'tipping points', if enough of the market moves to a new standard, the rest of the market will follow suit. If, for example, 25 percent of all vehicles meet a new, stricter fuel efficiency standard, the whole market will adopt it. It will no longer be worthwhile to produce to a lower standard.

We need governments to use public procurement policies as enabling policies to shift markets solidly into green territory. If they do, entire markets will 'tip' and both production and consumption will be transformed.

5 Conclusion

The Green Economy is a desirable and necessary goal. Indeed, if we are to reach sustainable development, there is no acceptable alternative. However, it is idle to believe that we can make the transition without an enabling policy framework. Putting this framework in place is the highest priority for the community that believes we must make the transition to a Green Economy in the interest of a sustainable future.

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Who Controls the Green Economy? – Some Critical Questions

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As other contributions to this volume show, Green Economy is a contested term, which can be filled with many different contents and which might orient varying strategies — according to different interests and world-views (however, some crucial commonalities can be identified, Brand 2012a, Goodman & Salleh 2013). The argument of this chapter is that if strategies towards a Green Economy do not break with the structures of the old economy, as well as related social forces and practices, and if it merely serves as a promise for a green growth programme, it will quickly lead to disillusionment and lose its sheen. And it will not succeed if the current development paths of emerging economies and other rapidly growing countries are not shaped. As seen in an impressive example at the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference), the government of Brazil played the music of a Green Economy, yet in fact promotes an unsustainable development path that focuses on economic growth and capitalist modernisation at any price, without questioning socio-economic, political and cultural structures (AS-PTA et al. 2012, BUKO 2012, Brunnengräber & Haas 2011). This is supported by big business, which is still searching for its role in the post-crisis economy and which seems to like the political strategy of increasingly converting elements of nature into 'nature capital'.

In this contribution I would like to juxtapose some current arguments in favour of a Green Economy with real economic, political and cultural developments. Three arguments deserve special attention: Firstly, the claim that the Green Economy reformulates the failed or at least insufficient strategy of sustainable development; secondly, the assumption that 'economy' and 'ecology' can now be reconciled; and thirdly, the supposed positive effects of a greening of the

economy for countries in the Global South and their fight against poverty. I try to show that the promise of a Green Economy runs the danger of being a false promise.

1 Sustainable Development and Green Economy: a Question of Political Will?

The current debate on the subject of a Green Economy can be seen as an attempt to sustainability. Expectations are high because it is widely recognised that sustainable development strategies have not made the world economy sustainable (UNEP 2011, Krausmann et al. 2009, Rockström et al. 2009). It is repeatedly argued that the strategy of sustainable development is ineffective because there is a lack of political will, and that environmental policy institutions are still too weak. As a new economic paradigm, the Green Economy is supposed to remedy this defect by creating green markets through strong international political institutions, which will act in cooperation with national governments (Mark Halle in this volume who sees a "policy environment favourable to the Green Economy" as key).

It is true that, despite many single successes, sustainable development policy has largely failed. The ecological, social and economic problems have not been solved. However, the causality analysis falls too short: The argument about 'weak political institutions' points to a lack of political will to create strong institutions. From my perspective, the argument of 'a lack of political will' is not an erroneous, but a superficial explanation for the structural overburdening of international environmental politics (Wissen 2010, Brand & Görg 2013) and leads to the next question: why is it that 'politics' has no will?

The reason is that the governments of the economically powerful countries do not question the Western mode of production and living and are holding on to a form of capitalist globalisation based on liberalisation and deregulation. Competition for world market shares and the aim of economic growth prevail, while gains in sufficiency are mainly lost by rebound effects (Madlener & Alcott 2009, Sorrell et al. 2009, Deutscher Bundestag 2013), which makes for the rapid increase of environmental pollution and resource consumption. For enterprises, a short lifespan for raw material-intensive products is often more profitable than the environmentally friendly production of top-quality goods (UNEP 2010, Dauvergne 2010).

The Green Economy remains within capitalist rationality (Wichterich 2011, Coutrot & Gadrey 2012, Goodman & Salleh 2013). The logic of being constantly oriented to new investments, profit and the dynamics of competition is not questioned (Brand — & Wissen 2012). The Green Economy will press ahead with capital-intensive mining and large-scale projects in the areas of infrastructure, expensive offshore wind farms and emissions trading. The concrete ecological costs in many of the world's regions, and also the social costs of ecological modernisation, therefore remain of secondary importance. Very often, problems are not solved, but only displaced, for example when cars in Europe are run on 'renewable' agrofuels while small farmers in Indonesia are expropriated or rainforests cut down in order to establish plantations for oil palms (McCarthy et al. 2013, Pye & Bhattacharya 2013, Pichler 2014). State policies have only limited scopes of influence because up to now they have been largely dependent on capitalist growth and capital's interests due to the stronger influence of powerful groups, to the state's dependency on taxes, and a strong discursive 'plausibility' that capital, with its search for profit and competitiveness, represents a kind of 'general societal interest', whereas the interests of wage-earners or social movements are often considered as particularistic. It is not by chance that for countries and their political leaders the priority is to 'maximise national economic growth'.

This being the case, the prospects for a Green Economy are fundamentally no different from those of 'sustainable development'. Both concepts focus on a capitalist ecological modernisation (Brand 2010).

2 Reconciliation of Ecology and Economy – or a New Round of Capitalist Valorisation of Nature?

I want to take this argument a bit further: The proponents of a Green Economy argue that ecology and economy can be reconciled. The prominent environmental scientist Ernst Ulrich von Weizsäcker argues, together with others, that a wave of new, fascinating technological innovations could become the greatest hope for a new economic growth period (Weizsäcker et al. 2009, p. 25, WBCSD 2012). A strategy against increasing environmental destruction consists in recognising the economic value of nature and giving it a price. Nature, so goes the assumption, will be protected if it is included in the calculation as 'natural capital'.

If we see any 'success' at the Rio+20 conference in the sense of accomplishing proclaimed aims, this was not so much the (intended) establishment of *Green*

Economy as a new global lead concept but the further confirmation of the concept of *natural capital* as political and economic common sense (NCD 2012, World Bank 2012, Monbiot 2012). This has to be seen in the context of the promotion of private-public partnerships and market-based instruments, as well as a growing financialisation of nature. In light of the obvious problems in reaching political consent, 'pioneers' should now become the crucial actors (WBGU 2012). However, under the existing conditions these pioneers are mainly private companies with the main aim of making profit. There is some progress concerning life-cycle assessments, for instance, which outline negative impacts of green innovations. However, it remains evident that the 'brown industry' still pursues its own interests. A recent example is the enormous controversy caused by the technique of hydraulic fracturing ('fracking') of gas and oil in the U.S.A.

Despite high expectations and some important progressive developments, I have my doubts whether the story of reconciliation is true. We cannot assume that 'green' goods are automatically produced 'cleanly'. Look at the example of electric cars: Producing their engines requires various metals — including 'rare-earth elements'. The quarrying of these metals and rare-earth elements (which are not at all so rare) takes place under ecologically and socially catastrophic conditions: resettlements, often the destruction of nature over large areas, poisonous emissions and the employment of cheap migrant labour (Blume et al. 2011, Arezki et al. 2012).

For instance, in his contribution to this volume, Dirk Messner argues rightly for a "low-carbon transformation" as a path towards a Green Economy. The historical reference to two transformation processes (the Neolithic Era and the Industrial Revolution) gives instructive hints to commonalities and differences. However, the argument is framed by a systems perspective that avoids looking at societal structures, and is an expert perspective: science tells us the truth about the problems and transformation research helps to outline a systemic change. Questions of interests and contestation, of diverging interpretations of problems, of democracy and justice are absent, the problems to be dealt with are seen as those of humanity and they are known and spelled out by 'experts'. Messner's argument is broader than just referring to the 'right' policy framework (as Halle does), that is the challenge is more complex. But implicitly it is argued that existing political and economic institutions as well as Western rationalities are able to solve the problems.

Secondly, Green Economy correlates positively with economic growth. What does this come down to? Economic growth means an increase in the produc-

tion of goods and services measured in money. Who produces the products, and under what conditions, plays a secondary role, if at all. The main point is to produce and sell more goods and services in order to make profit. But the decisive question, rather, is: under what conditions is this green growth taking place? Who decides what can be recycled and how — and why does waste prevention not come first? Who therefore controls the Green Economy? Whose interests does it serve?

Moreover, if proponents talk about the 'economy' they usually mean the capitalist market economy, which is the goods and services produced as commodities to be sold. We know from feminist economics in particular (Gibson-Graham 2006, Beneria et al. 2011), but also from the many contributions to the 'beyond GDP' debate, that the economy, as the production of material wealth and well-being, is much more about the goods and services produced by non-market activities, subjective well-being like the capacity of self-determined action, or having more time at one's disposal, among many other aspects (EU COM 2009, Frey 2008, Stiglitz et al. 2009, Biesecker & Hofmeister 2010, Brand 2012b).

In sum, proposals for a Green Economy are at risk of intensifying the capitalist valorisation of nature. ETC Group, a nongovernmental organisation, asks, "Who will control the Green Economy?" and names many companies that are already controlling and intend to expand control over renewable energy production, agriculture and food production, and the health sector (ETC Group 2011; for the energy sector Hildyard et al. 2012, Brand & Wissen 2015).

3 The Global South and the Fight Against Poverty

According to the United Nations Environmental Programme (UNEP 2011, p. 16), a Green Economy is not only a means against climate change, resource depletion and energy insecurity, but also shows the countries of the Global South a way out of poverty because it reduces carbon dioxide emissions, promotes resource and energy efficiency and alleviates environmental destruction. If economic growth and investments are less dependent on the destruction of environmental goods and the sacrifice of environmental quality then the rich and poor countries can equally achieve a more sustainable development.

Real world dynamics are quite different and to change them is an enormous challenge which, from my perspective, goes far beyond strategies of a Green Economy. Firstly, the upswing in many countries of the South has indeed lifted

millions of people out of poverty, but the impressive economic growth in these countries is also based on non-sustainable modes of production and life, namely on its catch-up industrialisation (Svampa 2012, Lander 2012). Countries such as China have achieved their enormous growth rates by competing in the world market with lower wages and often under ecologically poor conditions — even in the production of solar panels for the Green Economy. Moreover, with the emergence of countries like China, India, and Brazil as strong and self-conscious economies, we in fact observe new geopolitical rivalries for scarce resources. The EU is promoting the Europe 2020 strategy and the European Commission (2011) refers explicitly to growing resource competition. I do not see this as a driving force for a progressive reconfiguration of societal nature relations in light of the problems of environmental degradation, despite the fact that geopolitical rivalry might lead in some cases to technological innovation. On the contrary, Western political and economic actors, together with the elites of the emerging economies, are promoting unsustainable modes of production and living which are often supported by their middle classes (Brand & Wissen 2012).

Secondly, liberal politics of open markets and fierce competition have led to deindustrialisation in many countries of the Global South. This has pushed many countries into the traditional strategy of resource extractivism, as a number of African, Asian and Latin American countries have been relegated to the status of raw-material suppliers to the North (Gudynas 2011b, Lang & Mokrani 2013). The Green Economy does not alter this, for it too needs resources — for example, 'sustainable' agrofuels from corn, soy bean, sugar cane or palm oil. In addition, extractivism, which predominantly takes place in countries of the Global South, enables the continuation of a non-sustainable mode of life in the Global North. Thirdly, in the countries of origin it is especially the small middle and upper social strata that profit from raw material extraction. The local population, on the other hand, get little from the exploitation of resources but as a rule must substantially bear the negative ecological consequences (Svampa 2012, McCarthy et al. 2013). Despite all achievements in the emerging countries in the areas of health and education, according to the 2011 Human Development Report of the United Nations Development Programme, social inequality is on the increase. And growing social inequality fosters non-ecological behaviour (UNDP 2011).

Fourthly, whether 'green' or not, the decisive question remains whether the causes of poverty and inequality are being confronted, and whether the economic and political structures are changed accordingly. A kind of development

that most easily leads to a concentration of economic power still prevails. People are expropriated and robbed of their possibilities of action. Small farmers lose their land and are reduced to the level of day labourers on big plantations where plants for agrofuels are cultivated (IAASTD 2009) — referred to in recent literature as "green grabbing" (Fairhead et al. 2012).

4 Outlook

The Green Economy is a threefold promise: to overcome the economic as well as the ecological crisis, and to alleviate poverty. Yet in fact we experience an ongoing destruction of nature, as well as an increase in conflicts and social inequality. I have tried to show in my analysis that one reason for this is precisely what the proponents of a Green Economy and green growth see as a remedy: the capitalist compulsion to grow and promote capital accumulation and to exercise domination repeatedly puts a spoke in the wheels. What should not be overlooked is that, under the conditions of a globalised capitalist market economy and related politics, there is indeed a response to problems such as environmental destruction, but this is largely under the control of capital, and according to the needs of corporations and the wealthy. It is mainly a stabilisation and generalisation of the "imperial mode of living" (Brand & Wissen 2012). Therefore, a partial shift of the energy basis and greater efficiency of production and products are possible and already taking place — if there is profit to be made then investors do not stand by the wayside. However, it is very much to be doubted that this incentive alone will lead to fundamental changes.

The Green Economy is thus not a win-win game but entails dozens of conflicts; it already excludes people, and it is mainly based on existing relations of power and domination. Consequently, what is important is to observe accurately the concrete forms of a Green Economy as well as the forces and interests driving it.

A horizon of socio-ecological transformation implies more than the prospect of ecological modernisation through a greening of markets and respective governance structures. It aims to shape social mind-sets, social power relations, structures, modes and contents of politics, the dominant ways and rationalities of production and living, and related vested interests (Geels 2010, Brand 2012c, Thie 2013).

For social and ecological reasons, but also for economic ones, our societies should gear themselves towards lower growth rates and make individuals and

societies less dependent on the capitalist market and its crises. Therefore, the pressure to grow and the interests connected to it must be overturned.

Against this background, it is not enough to create adequate governance mechanisms for green markets to avoid resource conflicts, to reduce greenhouse gas emissions, or to stop the erosion of biodiversity. These have already been demonstrated in the era of sustainable development (Park et al. 2008). The underlying drivers of unsustainable production and consumption patterns need to be reshaped. A first step is to acknowledge those drivers. Therefore, we should no longer give priority to forums like the Rio+20 conference or the Rio institutions. They largely failed as they were unable to cope with the drivers (Brand & Görg 2013). Therefore, the concept of sustainable development should be re-thought and, at least, complemented. An intense debate on 'grand societal challenges', 'societal transformation' — or 'socio-ecological transformation' — is taking place (Brand & Brunnengräber et al. 2013, Klein 2013, Deutscher Bundestag 2013, JPI CLIK'EU 2011), and research acknowledges it (WBGU 2011, Hackmann & St. Clair 2012). An emerging research paradigm and political concept around degrowth is evolving (Martínez-Alier 2010, Kallis 2011).

A second step should be to link the debate about the drivers and structural forces of non-sustainability with questions of democracy. This means not only considering actual problems of participation, but also requires asking who decides today about the dominant and mainly problematic norms of production and consumption; about forms of mobility and communication, housing and cities, agriculture and food; and about overall development paths.

The horizon of socio-ecological transformation might create space for more fundamental alternatives beyond ecological modernisation constructed around issues such as: democratising control over societal nature relations (instead of leaving this control mainly to capital and its political allies); equitable access to the earth's resources and carbon sinks (instead of the externalisation of ecological costs from the Global North to the Global South, and from wealthier social groups to those that are marginalised); strengthening the notion of sufficiency (instead of focusing primarily on efficiency); linking questions and practices of decoupling with a comprehensive and democratic understanding of wealth, well-being and social equality (and not focusing on economic growth); and considering alternative experiences, approaches and concepts in other regions of the world, for example, in countries like Bolivia or Ecuador with their attempts to acknowledge and strengthen different approaches to nature and societal relations to it (Lang & Mokrani 2013, Acosta 2011, Gudynas 2011a, 2011b, Brand et al.

2012 — also on the contradictions of the current model). Given the depletion of resources, the overloading of sinks, and the increase in socio-ecological conflicts on various spatial scales, the conditions to pursue these issues and to politicise them successfully seem to exist. The contribution of critical social and natural science is to produce knowledge about the rapidly changing contexts and the sphere of action for progressive socio-economic, political and cultural actors.

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PART 2

EMERGING ECONOMIES, RAPIDLY GROWING COUNTRIES AND THE GREEN ECONOMY

BRAZIL – Shaping a New Economy: a Brazilian Civil Society Perspective on Central Issues for a Transition, in the Context of Rio+20

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Economy is the fastest and most effective 'instrument' available for modern society to reach the scale and volume required to achieve sustainable development. However, for such purposes, we cannot count on the kind of economy that gave us the speculative bubbles, global crisis and current structural inequalities.

Despite the controversy over the actual meaning of the phrase, a green economy could be the answer we need, provided that it is based on a framework that respects the planetary limits and guarantees human rights for all. In this article the term green economy, without any other adjective, is used to refer to a broad set of proposals aiming to steer economic activities and policies towards sustainable development or, more specifically, towards the transformation of the global economy into a socially just and sustainable model, from ethical and democratic perspectives (Green Economy Coalition 2012).

This article reports in brief on the conclusions from a series of debates held by the Brazilian Vitae Civilis Institute in the run up to the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference)[1]. It emphasises that, regardless of areas of performance, approach and ideological assumptions, some aspects have stood out in the debates: 1) the prevailing economic model is the origin and cause of the current economic, environmental and social crises and must urgently change; 2) this change must take place so as to ensure that human and environmental factors are deemed at least equal to economic and

1 This article was finished in November 2012.

financial parameters; 3) not only the transition towards a new model, but also the management of the model itself must be supported by a new inclusive and participative social governance; 4) civil society must have a more active role in decision-making and rulings that have collective impacts. More specific conclusions were also drawn concerning the four issues in focus, and are highlighted later in this article.

1 Debates on Green Economy in Brazilian Civil Society

Held in Rio in 1992, the United Nations Conference on Environment and Development (Rio conference) was deemed a milestone in the discovery process and in constructing more just and sustainable development models. Two decades on, organised civil society worldwide has been engaged in the 'Rio+20 process': a global debate on sustainability and social justice catalysed by the Rio+20 conference. Despite general criticism of the achievements of its 'official process', expressed in the Rio+20's outcome document *The Future We Want*, the conference constitutes a major milestone along the path towards sustainable development. In its two-year preparatory process, the Rio+20 conference leveraged the

About the Dialogues Promoted by Vitae Civilis in the Context of Rio+20

Contribute and influence public debate: this was the major objective of the work developed by the Vitae Civilis Institute at the Rio+20 conference and throughout its preparatory process. Such work was done with the fundamental support of a number of partners, some playing a special role as main sponsors, to whom we express our gratitude: Ford Foundation, Arapyau Institute and Oxfam International. In addition, IIED (International Institute for Environment and Development), UNEP (United Nations Environmental Programme), the Green Economy Coalition, and adelphi (on behalf of German international cooperation and environmental bodies) have also brought important contributions and motivation. The authors also thank all other supporters, partners and participants, who are not possible to enumerate here, but are mentioned on the project's website and in its documentation.

The result was an encompassing and comprehensive process of reflections, debates and proposals, which involved an early stage—the 'Green Economy

National Dialogues' (June 2010 to November 2011) and a later stage — 'Shaping a New Economy' (July 2011 to June 2012). The debates on green economy are continuing after the Rio+20 conference, and will be reported in the future.

Conclusions herein have a special focus on the 'Shaping a New Economy' cycle of debates, while also drawing from the broader process. Special credit is due to Vitae Civilis' partners in these debates:

FBOMS — The Brazilian Forum of Non-Governmental Organisations and Social Movements was created on 18 June 1990, seeking to facilitate participation of civil society throughout the entire United Nations Conference on Environment and Development in 1992 (the Rio process). In this process, as a result of its participative and democratic framework and way of working, the FBOMS consolidated itself, strengthening its role in dialoguing with other important Brazilian and international social players, to fulfil its mission of contributing to the unification of social, economic and environmental matters in the pursuit of sustainable development with the purpose of achieving a more fair, equitable and environmentally correct society (www.fboms.org.br).

CUT — 'Central Unica dos Trabalhadores' is a major Brazilian union organisation operating at a high level and with an autonomous and democratic character. It is committed to campaigning for the immediate and long-term interests of the working class. Based on the principles of equality and solidarity, CUT's objectives are to organise, represent and guide the fight of workers in the city and the field, in the public and private sectors, be they active or inactive workers — for better living and working conditions and for a more fair and democratic society (www.cut.org.br).

International Labour Foundation for Sustainable Development (Sustainlabour) was established and developed based on the belief that workers play an essential role in the path towards a sustainable world. Union organisations are in a unique position to encourage social aspects of sustainable development while, at the same time, they contribute to the economic and environmental dimensions (www.sustainlabour.org).

IDS — Institute for Democracy and Sustainability is a plural and nonpartisan civil society organisation. Created in October 2009, the IDS is the result of the pursuit for alternatives in Brazilian development based on new values and assumptions that value economic potential, environmental assets and cultural and social diversity in Brazil (www.idsbrasil.net).

Ethos Institute for Business and Social Responsibility is a non-profit organisation created in 1998, whose mission is to mobilise, sensitise and help companies to manage their business in a socially responsible manner, partnering in the construction of a just and sustainable society (www.ethos.org.br).

debates on green economy among all stakeholders and global players, including Brazil. While a part of society, government and the private sector have been pondering the topic — some enthusiastically, some more carefully — there have also been very sceptical players — mainly in social movements but also in other sectors of society. This scepticism relates especially to the broad green economy concept, which has been criticised as a way to commoditise life and common goods, or as a strategy to hamper emerging countries' development. The concept has even been seen as a public relations scheme or mere greenwashing.

Regardless of how each individual interprets or feels about the phrase, green economy has become part of the agenda and key players in Brazilian society must exchange their views and impressions about the topic. This must be done to develop common grounds that can contribute to shaping ongoing and future debates, in order to avoid the misuse of this powerful and emerging wave. In order to contribute to the debate, the Vitae Civilis Institute, with support from a number of partners, promoted two dialogue processes: the 'Green Economy National Dialogues' (from June 2010 to November 2011) and 'Shaping a New Economy' (from July 2011 to June 2012) (Green Economy Coalition 2011, Vitae Civilis 2012a, Vitae Civilis 2012b).

There are a great number of topics involved in the transition to a sustainable economic model, with relevance for the concepts of green economy and sustainable development. The focus of the 'Shaping a New Economy' debates was on four strategic pillars, owing to their importance to Brazil and their cross-cutting nature in relation to other topics: "financial institutions and economic instruments", "green jobs, decent work, production and sustainable consumption", "sustainability and respectful coexistence in different biomes and territories" and "sustainable development governance, environmental integrity and social justice".

Four key institutions from Brazilian civil society were invited to become partners in the initiative: the Brazilian Forum of Non-Governmental Organisations and Social Movements (FBOMS), Ethos Institute for Business and Social Responsibility, 'Central Unica dos Trabalhadores' (together with the Sustainlabour Foundation) and the Institute for Democracy and Sustainability (see box above). Each entity has taken the lead on the reflection and mobilisation process in relation to one of the topics, drafted the input documents to guide the debates, invited stakeholders and other representatives of civil society to the discussions, coordinated the dialogue, and drafted a conclusions report. Vitae

Civilis coordinated the whole process, providing its connections, overall rationale and reporting.

The debate stage was held in February 2012 and gathered approximately 60 people from over 30 organisations representing many sectors from Brazilian society. The debates were organised in a round table format. All the debates allowed reflection on the diverse aspects of green economy and sustainable development concepts. However, this was achieved without losing focus on the pressing need to seek alternatives to the current economic model, which must migrate to more balanced and fair formats and proposals: that promote a real income distribution and that revert the current trend of depleting natural resources beyond the planet's ability to recover.

2 Context

The debate about the transition from the current economic model to a more socially fair and environmentally sustainable one is not new and is not a result of the proposition of the green economy concept. This debate has been going on for many decades and has reached its current design with the idea of the sustainable development triangle (social, economic and environmental).

The sustainable development concept was extremely important when it was launched by the Brundtland Commission back in the 1980s, and can be considered a fundamental part of the Rio conference agenda in 1992 (Dodds & Strauss, pp. 24–27). However, as a result of the peak of neoliberal doctrines in the 1980s and 1990s, with the Washington consensus and Paris Club dictating the rules and globally disseminating those economic concepts and practices through the International Monetary Fund and the World Bank, the implementation of sustainable development policies, especially the economic aspects, were far below recommendations. As this wave spread an absence of state control over market actors, the hegemony of particularism and short-termism among decision-makers hindered advances towards the integration of environmental and social matters in economic decisions and policies (Haque 1999, pp. 197–218). Without a state that is able to propose and implement policies to level the field and guide the transition, the speed at which changes occur will always be dictated by the more powerful actors. These are too often the actors who benefit most from the current situation, and thus are less likely to change.

The erosion of public and social control over market actors increased the distance between societal expectations and the responses of the financial markets, making the transition to sustainable development even harder. This became clear in the financial crises of the last two decades, and especially in the solutions proposed to get out of them. Emblematic examples are the Asian, Russian, Argentinean and Brazilian crises in the 1990s, and more recently, the European Union's austerity package.

With the most recent economic crisis, sparked by the speculative bubble that burst as a result of real estate mortgages in the United States, many social players, especially United Nations Environment Programme (UNEP), saw that the answer to this crisis could be an opportunity to speed up the transition into a sustainable economic model. In this context, UNEP started a set of studies on the so-called green economy (UNEP 2011).

For UNEP, green economy can be defined as an economy resulting from an improvement in human well-being and social equality, while at the same time significantly reducing environmental risks and shortage ecology. It would have three major attributes: low-carbon, efficient in natural resource usage, and socially inclusive (UNEP 2011).

The transition towards a green economy within the environmental and biodiversity preservation context, considering the ambition of eradicating poverty and inequalities, was appointed as one of the two core topics of the Rio+20 conference (the other being the institutional framework and governance instruments for sustainable development) (UNGA 2010).

Having green economy at the core of the Rio+20 agenda, the topic gained prominence and became the highlight of the event. The main forums debated the issue and as the discussion grew, the social and political players developed different outlooks and identified items of criticism and polemic. In summary, the players can be distinguished as follows:[2]

- Players that debate how a green economy should be developed concerning sustainability and guaranteeing rights;
- Players that have an uncritical view and focus on practical matters in relation to business opportunities;
- Players that simply refuse the topic, either claiming that by including markets as part of the solution green economy would be illegitimate and inconsistent,

2 Later in the process, this perception was systematised by Vitae Civilis in a schematic typology (Vitae Civilis, undated).

or that it would be a strategy for rich countries and business to hamper the development of emerging and developing countries.[3]

By recognising the existence of different perspectives, which in some cases even oppose each other, Vitae Civilis' approach — in line with the orientation of the Green Economy Coalition (Green Economy Coalition 2011) — was to develop an initiative that would try to bring different segments of society closer within a critical perspective in relation to green economy. This matter should be recognised as an important field for civil society to engage in, and a possible path to swiftly advance towards sustainable development.

In the early phase of Vitae Civilis' debates on green economy (the Brazilian National Dialogues), some key dilemmas and controversies were already identified. This helped to focus subsequent debates and search for solutions or, at least, spot the most sensitive points to be tackled (Vitae Civilis 2012a):

1. Distrust and a lack of information

Since there is no precise consensus or technical definition of what 'green economy' really should be, people still have mixed feelings on the subject, depending more on individuals' particular perception and interests rather than on objective analysis. The problem of supposed veiled interests is always part of the debate.

2. Opportunism and greenwashing

While there are no clear agreed definitions and guidelines on the transition towards a green economy, opportunist actions and greenwashing based on the concept are emerging and thriving, and so inflating the problems of distrust and misinformation.

3. Protectionism

In a global economic crisis scenario, governments and corporations — inside and outside Brazil — are worried about possible changes brought by the green economy and tend to be protectionist. For some, it is seen as a tool to keep the current global division of work.

3 Some examples of international organisations that have a critical perspective on green economy are the ETC Group (www.etcgroup.org), the Third World Network (www.twnside.org.sg) and the Friends of the Earth (http://www.foei.org). Some Brazilian examples are the Federation of Organs for Social and Educational Assistance (FASE) (www.fase.org.br), the Brazilian Institute of Social and Economic Analyses (IBASE) (www.ibase.br) and the 'Rede Jubileu Sul' (www.jubileusul.org.br).

4. Short-term vision

While many proposals for a green economy are under debate, few people in governments and companies are seriously talking about structural changes that have the potential to improve the sustainability scenario in the long term.

5. Long-term investments and vested interests

A major obstacle for the transition to a green economy has been identified as capital-intensive projects planned and financed in a way that their feasibility depends on business as usual and continuous economic growth (such as big dams and oil exploitation). Unless changes in the regulatory framework are made, those forces will steadily hamper the flourishing of green economy.

6. Claims of 'false solutions'

A number of academics and environmental organisations are sceptical about green economy because they see it as diverting the discussion from the central problems (overconsumption, inequality, continuous growth). Instead, these are replaced by an incremental perspective, which risks promoting a 'soft approach', rather than facing the core, hard problems causing current crises.

7. Unemployment or Fair Transition?

Brazil's labour unions were very focused on Rio+20, and moving to a more positive take on sustainability — provided that the transition to a green economy comes in a fair way, with focused and effective policies to create opportunities and avoid the risk of growing unemployment.

8. Production and consumption disparities

As a developing country, Brazil faces challenges concerning how to increase well-being without being unsustainable. The situation is not the same for all countries as some are even poorer, while others have huge excesses. The fact that some people need greater access to goods and services, while others must reduce waste and consumption, makes it more difficult to reach a common global view.

Since Vitae Civilis had an important role in the international preparatory process for the Rio+20 conference — as a Host Country Liaison organisation bridging the Brazilian Civil Society Facilitating Committee and the United Nations Major Groups caucus (UNCSD, undated) — the authors were frequently able to

interact with representatives of very diverse stakeholder groups and countries involved in the global debates on green economy. It could be observed that the topics above — despite some variations in focus and intensity — were applicable to most countries, especially the developing ones.

Building on the lessons learned from the National Dialogues conducted in Brazil, Vitae Civilis' later initiative was made up of a series of deep debates with important civil society organisations, with the objective of focusing on crucial matters that cut across the economic, social and environmental aspects. In the next section, we summarise the main outcomes of these debates (Vitae Civilis 2012b).

3 Conclusions

The predominant factors and highlights of the debates carried out for this project in Brazil, and in the preparatory path for the Rio+20 conference as a whole, were the richness and diversity of civil society contributions. There is clearly a consensus in many things — but especially in relation to the expectation that the economy must be transformed so as to foster a fair and sustainable society that guarantees human rights and respects planetary limits. However, it is clear that there is a need to create a higher common understanding in discussions about the implementation of concrete policies and initiatives to carry out this transition.

Therefore, decision-makers in the public and private arenas should be alert and swiftly take actions in the direction needed. Major changes must come from encompassing societal agreements, considering everyone's interests, so they may be legitimate and effective. Any changes for the green economy can only be successful if civil society is effectively engaged. In this sense, we must emphasise a recurring theme from the transition discussions towards a new economy: social control and participation in the public and private sectors.

The green economy must be part of a new governance system for society. A more balanced system, where decisions that have an impact on collective interests are made in a more participative and transparent manner. Social control in relation to political and economic players, including financial markets, must be one of the pillars for a new social governance, and therefore, for a new economy. Societal participation must be a transversal guideline that permeates all the aspects of the green economy.

Another factor that must be taken into account for the transition, and which is also a recurring factor, is money market regulation. After decades, it is clear that self-regulation is not an efficient method of producing effective changes in scale. We must therefore consider creating regulatory milestones to guide the behaviour of market agents towards sustainable development. These new regulatory milestones must encourage sustainable and fair activities, and discourage production models that harm the environment and that do not guarantee human rights for workers and communities. As mentioned above, in the 'Shaping a New Economy' reflection process, four core topics for the transition into a new economy were addressed: governance, living, employment and finance.

Sustainable development governance was identified as a key factor for this transition. In this sense, action should not just focus on the need to transform UNEP and United Nation Economic and Social Council, but also to develop, implement and monitor goals for sustainable development. Such goals could have a key role, provided that they are drafted through a participative process and that they are aligned with *all* the Rio Principles, from the 1992 Rio Declaration (Dodds & Strauss, pp. 34–36). Although paragraph 248 of *The Future We Want* includes the creation of Sustainable Development Goals until 2015, the process to make it happen remains unclear, raising doubts whether it will be participatory or not.

Living in biomes and territories with respect and dignity can only be attained with environmental preservation and social well-being. To this end, the traditional idea of economic growth should be abandoned and more inclusive and less aggressive models to create wealth for all of society should be sought. The green economy must be based on and must reinforce all agreements and accumulated knowledge in sustainable development, especially the Rio Principles, instead of creating something new and conflicting. Another essential factor is that the environment should not be seen as a mere 'economic resource' for the production sector, but should be valued in all its facets, especially as a place where life is reproduced and a sine qua non for human survival.

In a new economy, society must seek models that create green jobs, decent work, and sustainable production and consumption. Therefore, the workforce must be treated as a key player in sustainable development and not as a simple production factor. Collective bargaining agreements must begin to consider said concerns and international solidarity must be settled so as to create equality between workers from different countries, getting rid of the differences that lead to exploitation.

The production of durable goods must abandon the paradigm of planned obsolescence, seeking to foster new production and consumption practices, with efficiency and balance. Reducing working hours must be seen as one of the main tools to reduce environmental impacts caused by production (especially carbon emissions) and to increase social inclusion by creating jobs and income.

The financial sector, not only public organisations but also the private ones, has a key role to play in the transition to another economic model and consequently must transform financial institutions and economic instruments. Although there are already many initiatives that seek to give the sector a positive role in sustainable development, they still do not have a core role and lack scale and/or speed.

Three main assumptions must be adopted to guide the financial sector in the transition towards a new economy: 1) green finance with a long-term risk view that considers the social and environmental conditions that we live in; 2) inclusive finance, which strengthens the role of small companies within large production chains, aligning them with sustainability; and 3) responsible finance, with control and management mechanisms that guarantee that financial activity will be aligned with societal interests, planet limits and the guarantee of human rights.

The global and national financial authorities should fulfil the role of providing stability to economies and protection for workers and consumers. This is a role that requires disrupting the traditional 'crises reproduction and recovery' model and continuous indebtedness of governments.

In the pillar of a new organisation of financial systems, more encompassing risk approaches, a long-term view and relationships with stakeholders are of essence. The creation of regulatory milestones with new performance and risk measures, new incentives and disincentives and, overall, the increase in market transparency, must provide the framework for a transition towards a green economy.

The debates developed by Vitae Civilis in relation to these four key issues — governance, living, employment and finance — make it even more obvious that the separation between social and environmental matters is not compatible with the pursuit of sustainable development. Issues such as inequality, poverty, fairness, income distribution, employment and social justice are directly related to challenges such as deforestation, pollution, climate change, preservation, sustainable use of natural resources and environmental justice.

This conclusion comes from the findings that the origin of the problems is the same, namely the contradictions inherent to the current economic model:

wealth accumulation without limits and without the guarantee of rights and environmental preservation. And yet it comes from the perception that the solutions proposed and implemented must consider the interdependence of the 'social' and 'environmental', always seeking to align the solution to specific problems with crosscutting changes in society's governance framework.

Facing the challenge of proposing solutions that consider not only the planetary limits but also the minimum guarantee of rights, in the conclusion of these debates an approach was endorsed that had been developed by the economist Kate Raworth (2012). This approach was proposed by Oxfam and broadly discussed during the Rio+20 conference and afterwards. It is based on the acknowledgement that the safe and fair place for humanity would be made up of two limits; an "environmental ceiling" and a "social floor" (Raworth 2012).

Prosperity must be targeted as a means to bridge the gap between these two limits. And that must be the role of the economy: to mobilise resources, make the most of them, and distribute its results well, within the social and environmental planetary boundaries.

More than a vision of the future, this framework of environmental and social limits is already being worked on with indicators and concrete metrics, and can already contribute to the development of global and local policies in the transition towards a green economy.

The solution for the constant social and environmental crises that society has experienced can only come from changing the current economic model. Economic institutions and instruments have global scale and permeate all of the aspects of daily life. Humankind is already late in placing economy at the service of sustainable development.

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MEXICO – Mexican Policy and Technology Options on the Road to Green and Low-Carbon Development

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1 Introduction

For Mexico, climate change represents one of the greatest challenges not only for the preservation of the environment, but also to social and economic development. Recent examples show that climate-related events are intensifying and becoming more frequent. At the beginning of 2012, for instance, more than 50 percent of Mexican territory was suffering the worst drought period of the last 50 years. Two years before, in contrast, Mexico had experienced the highest levels of precipitation ever recorded in vast regions of the country — with record average rain, as well as very intense rainstorms that caused floods that affected more than one third of the national territory. Also in that year, 2010, there was the worst hurricane season ever registered in Mexico, with a cost of roughly 0.6 percent of the national gross domestic product (GDP). In all, in 2010 alone, 702 municipalities from 17 states (out of a total of 32 in the country) suffered damages from climate-related disasters and required federal support (CICC 2012, INECC 2012a).

While impacts have been increasing in magnitude and frequency, it is their combination with environmental and socio-economic conditions that makes Mexico a highly vulnerable country, especially in certain regions and sectors. Poverty, in particular, is a major factor for explaining some groups' vulnerability to climate change. But so too is the lack of institutional capacity to deal with the issue and to plan adaptation more coherently, especially at the local level, at which several measures and policies are more relevant. An additional factor here is the limited coordination among sectors and levels of government.

It is widely accepted in Mexico that responses to climate change must not be delayed, not only to adapt to its projected impacts, but also to address its causes — no matter how little by comparison the country has historically contributed to them — because it makes sense economically and socially. The study of the economics of climate change for Mexico (Galindo 2009) supports this view, stressing two relevant lessons: first, that it is economically wise to act now and not to risk suffering the implications of greater losses; and second, that even if climate change was not a concern, in a world with limited resources, increasing population, and the need to improve living standards, acting in response to signals of natural resource scarcity makes sense, at least economically.

2 Low-Carbon Development Commitments and Progress

Mexico has seen the combination of, on the one hand, climate change and the degradation of natural capital, and on the other hand the need to grow and correct social inequalities, as a great opportunity to catalyse a transition to a low-carbon, resource-efficient, and climate-resilient green economy.

This is the main reason why Mexico, through a legal mandate, has voluntarily adopted a greenhouse gas (GHG) mitigation target of 30 percent below business as usual by 2020 and a very ambitious goal of 50 percent reduction in annual emissions by 2050 with regards to the year 2000 (DOF 2012). These targets are sustained by the belief that Mexico can achieve steady and sustainable economic growth by implementing a low-carbon development strategy and transitioning to a green economy paradigm, which promotes specific technologies and enables the implementation of the necessary public policies and institutional arrangements, including the proper incentives and conditions to support the expansion of a private sector that supplies 'greener' goods and services.

So far, Mexico has achieved some progress in the design and implementation of a number of measures that put it on the road to green and low-carbon development, but in order to move faster, it would probably need to follow a more comprehensive, inclusive green growth path, as stated in the National Development Plan 2013–2018 (DOF 2013). The new Climate Change General Law (DOF 2012) will be one of the most important drivers to achieve this. Among other provisions that will be discussed later on in this chapter, it provides for the obligation, which will fall under the responsibility of the federal administration, to put together a short-term plan similar to the one that operated during the last

three years of the previous administration, focused mainly on actions by the government itself. Besides this, the law also establishes the goal of having a more comprehensive mid-term climate change strategy that should be economy-wide and include both adaptation and mitigation strategies.

A lot of the analytical work to sustain the design and implementation of the strategy and plan mandated by law had been advanced, although it was refined and updated in order to meet the needs of policymakers and the new obligations mandated by law. There was also some conceptual work on both adaptation and mitigation already completed in 2012, which had been compiled and published in two separate documents (INECC 2012a; INECC 2012b), containing the vision, elements and criteria for these two issues, and which have served as inputs for the adaptation and mitigation components of the new climate change strategy and plan.

3 Overall Strategy

Mexico is a developing country and a Non-Annex I Party to the United Nations Framework Convention on Climate Change (UNFCCC), and as such it has no obligatory GHG mitigation targets. Nevertheless, Mexico has been a very active player in international climate negotiations, and voluntarily associated itself with the Copenhagen Accord. Under this agreement reached in late 2009, it committed to a target of 30 percent reduction of emissions below a business-as-usual baseline by 2020, provided that there was sufficient international support and financial resources to achieve this goal, including bilateral cooperation, which is fundamental to reach the targets set. Later on, at the 2010 United Nations Climate Change Conference in Cancun, where it was the host and leader of the negotiations, Mexico ratified this goal under the umbrella of the Cancun Agreements. More recently, in 2012, these targets became law, seeing them included among the provision within the new Climate Change General Law, which was published on 6 June 2012 (DOF 2012).

One of the specific ways in which Mexico strove to fulfil its commitment was to implement a Special Programme for Climate Change (PECC) for the latter part of the previous federal administration, establishing quantitative mitigation and adaptation goals for the period of 2009–2012 (CICC 2009). This programme contained several short-term actions with which Mexico expected to mitigate a total of nearly 50 million tonnes of carbon dioxide equivalents aggregate in

the three-year period covered by the programme. This is a substantial amount considering that its total GHG emissions reached 709 million tonnes of carbon dioxide equivalents in 2006. According to the review of the PECC, this target was reached and even slightly surpassed (CICC 2012).

PECC 2009–2012 constituted an initial step on the way to low-emissions development and ultimately on the road to achieving a green economy. It was short-term and mostly focused on actions carried out by the federal government, but was nevertheless successful. So successful in fact that the new administration, which took office in December 2012, was compelled by the Climate Change General Law to prepare a new version of this programme to tackle short-term goals for their six-year term in office. The PECC 2014–2018 was launched in April 2014.

4 Analytical Work as the Basis of Policy-Making

For substantiating its mid- and long-term targets, Mexico has been successful in identifying several of the technological changes and fiscal policies required to cut GHG emissions in the most relevant sectors, and has made significant progress in prioritising among available technologies, and in identifying and analysing policy options to promote their implementation (INECC 2012b; CICC 2013). Another crucial issue for the development of concrete national GHG mitigation strategies for the longer term has been the identification of technical, economic, legal and institutional barriers for their implementation, and especially the definition of ways to overcome them. Barriers are varied, and defining them for each specific technological or policy alternative under consideration may be decisive for their successful implementation.

The point of departure to identify where the national potential for GHG mitigation lies is the National Inventory of GHG Emissions. From its latest update (CICC 2012), it is known that one of the largest sources of GHG emissions in Mexico is energy generation and consumption, which accounts for around 60 percent of all emissions in Mexico. For mitigating these emissions, there is great potential not only through renewable energy, but also through technological improvements on the supply side of the energy sector in general (specifically to reduce energy leaks and to improve efficiency), as well as on the demand side (particularly on industry, the commercial and residential sectors, and transportation). According to the Ministry of Energy (SENER 2013), Mexico has a large potential for saving energy through a combination of measures and technolo-

gies. It is estimated that these savings could account for as much as 20 percent of the total energy consumption of the country, and that consequently GHG emissions would decrease accordingly (INECC 2012b). In the case of renewables, the potential is also large for practically all technologies. However some barriers, mostly financial and political, have impeded the realisation of this potential, despite the fact that the economics of several renewable technologies is now favourable in comparison to traditional sources, even though Mexico is an oil producer and exporter. There is a clean-energy generation capacity target of at least 35 percent by 2024 (DOF 2012), most of which would be renewable, although the law that sets this target left the door open to other 'clean sources' of energy, from the atmospheric emissions perspective.

In addition to the National GHG Emissions Inventory mentioned earlier, the most important input in defining the national 2020 mitigation target was the mitigation abatement curves analysis coordinated by the National Institute of Ecology (INE) in 2009, later refined in 2010 and last updated in 2012, already by the National Institute of Ecology and Climate Change (INECC). The latter was formed in October 2012 as a spin-off of the old INE, though with a new name and responsibilities mandated by the Climate Change General Law. This recent update was also mandated by the same law that created INECC, in order to provide input for the design of the National Climate Change Strategy and the PECC 2014–2018.

The cost-curve analysis assesses the theoretical cost and mitigation potential of about 130 measures across all sectors, under certain assumptions. According to the analysis, with the sum of options already available, Mexico could mitigate as much as 261 million tonnes of carbon dioxide equivalents annually by 2020 (out of 872 million tonnes of carbon dioxide equivalents that would be emitted according to baseline projections for that same year) with most measures having a cost of less than 30 euro per tonne of carbon dioxide equivalents (INECC 2012b; CICC 2013).

5 Establishing Further Opportunities

Besides energy, there is also great potential in other sectors. One of the main examples here is transportation, which by itself accounts for nearly 20 percent of total GHG emissions and one third of the emissions derived from energy generation and consumption (CICC 2012). In this sector, a lot can be achieved

in terms of mitigation through changes to cleaner and more efficient transportation modes, fuel improvements, and efficiency improvements, particularly for cargo and passenger vehicles (INECC 2012b). A new vehicle standard that was recently published, for instance, would increase gasoline passenger-vehicle efficiency from a current average of 13.1 kilometres per litre to 14.9 kilometres per litre by 2016, with a total cumulative GHG emissions abatement of roughly 170 million tonnes of carbon dioxide equivalents during this period (DGIPEA 2012).

Targets set by the Climate Change General Law that would have implications for GHG mitigation also include the objective of achieving zero percent net carbon loss from forest ecosystems by 2020, which implies no net deforestation by then (DOF 2012). This is a very ambitious goal, given the many existing pressures — particularly of an economic nature — for deforestation.

Not all low-carbon development opportunities in Mexico imply technology shifts. Many relate to behavioural changes, which require information and economic incentives. In regards to fiscal policies, one of the obvious opportunities is the removal of energy subsidies, particularly fossil fuel subsidies. In Mexico, these subsidies are proven to be regressive and inefficient. In the case of gasoline subsidies, for instance, the poorest 20 percent of the population receives about three percent of the total of this subsidy, whereas the richest 20 percent gets nearly 52 percent (CICC 2012). If the rationale for these subsidies is to correct social inequalities, they are certainly not succeeding. Besides, in all, they have a great opportunity cost, and it would be much better if they were redirected towards social programmes, especially since energy subsidies overall more than double the amount provided for poverty alleviation programmes in Mexico. Furthermore, they constitute a barrier to the adoption of more efficient technologies and innovation, are a source of negative externalities, and weaken public finances. The good news is that gasoline subsidies are at least being gradually phased out in Mexico. In the period from 2007 to 2011, monthly gasoline price increases resulted in avoided aggregated GHG emissions between 67 and 145 million tonnes of carbon dioxide equivalents (CICC 2012).

In all, the measures analysed in the cost-curve analysis pursue the following seven objectives: 1) to increase penetration of greener technologies for power generation; 2) to improve efficiency in energy transformation; 3) to promote efficiency in energy consumption; 4) to encourage low-carbon urban development and transport solutions; 5) to manage waste responsibly; 6) to manage forests sustainably, while enhancing forest carbon stocks; and 7) to decrease emissions

from agriculture and livestock. In terms of adaptation measures, it is essential for Mexico to implement actions in sectors highly dependent on natural resources such as agriculture, livestock, fisheries, forestry, mining, oil and natural gas, and tourism, as well as to protect ecosystems and biodiversity, and promote capacity development at the subnational levels.

According to some economic modelling, by implementing all these measures, which are a fundamental part of Mexico's new Climate Change Strategy, national GDP would increase by about 5.8 percent by 2020, reducing at the same time the rate of unemployment by almost half against a business-as-usual scenario. This would see the creation of nearly three million additional jobs and progressive changes in income distribution (INECC 2012b).

Having all the analytic work being carried out so far in hand, complemented by feasibility analyses and financial and economic studies, made it possible to define realistically what the country's low-emission development goals in the medium term could be. Still, to a large extent, compliance with these targets, especially higher-cost ones, will depend on international assistance agreed on at multilateral forums, namely: carbon markets, bilateral funds, and support mechanisms like the Green Climate Fund, for whose design Mexico played a very important role until its attainment at the United Nations Climate Change Conference in Cancun at the end of 2010.

6 Mexico's Commitment Towards Green Growth

So far, although Mexico has no binding emission-reduction commitments under international agreements, it has undertaken ambitious actions to promote efforts on low-carbon development based on cleaner and more efficient practices and technologies, only comparable to those of the developed and emerging countries.

The National Development Plan 2013–2018 includes the objective to push forward and focus on inclusive green growth as a means to support efforts towards a more prosperous country. Green growth is conceived as growth that guarantees the preservation of the country's natural patrimony at the same time as generating wealth, competitiveness and employment (DOF 2013). National planning instruments have more often adopted the term of 'inclusive green growth', though in essence this term is used interchangeably with the concept of 'green economy'.

All progress achieved in putting together necessary analyses, and even advancing some of the required alliances with all relevant sectors, became useful for putting in place the National Climate Change Strategy mandated by law (CICC 2013), and also served as an input for the PECC 2014–2018. These planning instruments, among others, reflect the objectives outlined in the National Development Plan, specifying the means to achieve them, being specific on goals, responsible entities, the allocated budget, and implementation timeframes.

At the international level, as well, Mexico has shown leadership in the promotion of low-emission development and green growth principles as ways to foster the drivers of economic growth that are consistent with the efficient use of natural resources and minimal environmental pressures, particularly in the context of the recent global crises. Mexico has also stressed that international cooperation is essential to support the advancement of inclusive green growth in domestic policies, particularly in developing countries, and most especially in least developed economies. This position has been evident in several international forums, and most recently during the Mexican Presidency of the G20, all through 2012, and in its positions at the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference).

According to its vision, a low carbon development strategy, complemented by an adaptation strategy, is a central element to achieve a green economy. It should include the implementation of an ample range of mitigation and adaptation efforts conceptualised within a wide green growth plan. Such a plan should offer multiple benefits such as poverty alleviation, green job creation, energy security, cleaner and more efficient production and consumption processes, and improved air quality, while also promoting the preservation of natural resources and biodiversity.

7 Conclusion

In Mexico, there are already several examples of policy and technology options for a green economy at the national level where progress can be reported. One of them, for instance, is the successful implementation of the original PECC programme. In addition, many of the policies and technologies required to achieve at least half of the 2020 national mitigation target are already in the initial stages of their implementation, if not even well advanced. Still, a significant push is required to achieve the remaining half, and especially to have green growth prin-

ciples permeate to the subnational levels and to some sectors of the economy like the financial sector, for instance. In these sectors there is a certain resistance to move away from business as usual, perhaps in some cases due to the fact that the benefits of supporting a transition to green growth are not yet perceived.

In terms of inputs for sustaining the transition to a green and low-carbon development path, a lot of the analytical work is also well advanced, both for the mitigation and adaptation component of the National Climate Change Strategy recently put in place.

Meriting a lot of attention among the results of the analytical work carried out so far, there are several barriers for the implementation of green economy measures in Mexico. They range from the technical ones, which are probably the least, to financial, political and even cultural ones. These barriers have been identified to a large extent, but a significant effort would still be required to remove or overcome them.

Enabling conditions to ensure the successful and full implementation of technology and policy options on the road to green and low-carbon development include, first and foremost, public buy-in and political support at the highest possible level. It is safe to say that both of them have increased significantly in Mexico over the last few years, and that they will be fundamental to achieving greater progress.

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CHINA – Piloting the Green Economy

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1 Introduction

Every five years, the Communist Party of China holds a national congress of more than 2,000 representatives elected by its members nationwide. It is probably the most important political event in China because it not only involves leadership change of the ruling party, but also sets the policy agenda for the five to ten years to come. In November 2012, the 18th Congress of the party in Beijing inaugurated the new leadership and highlighted a policy built around the idea of ecological civilisation. Green economy was a most visible element in the new policy agenda. This marked the start of a new era of green development, and the continuation of a key policy direction taken by the previous administration in recent years.

At the United Nations Conference on Climate Change on 22 September 2009, President Hu Jintao told the heads of states worldwide that China will push forward the green economy and actively develop a low-carbon economy, in response to global climate change (Hu 2009). This was the first time that the top Chinese leader made a solemn announcement on green economy. A few months later in May 2010, China invited more than 2,000 experts, government officials, and business leaders to a major international conference in Beijing to discuss the concept, content, and policies for developing green economy in China and worldwide. On 7 June 2010, President Hu explained that green development requires the advancement of environmentally friendly industries, the improvement of energy and material productivity, the protection and restoration of ecosystems and the environment, the promotion of circular economy and

low-carbon technology, and balanced socioeconomic development and nature conservation. This was about two years before the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference), and one year before the release of the United Nations Environment Programme (UNEP) report on green economy. It reflected the political consensus among the top Chinese leaders and government commitment to a green economy.

Green economy is not a new concept. For example, Michael Jacobs and Victor Anderson (1992) published a book entitled the Green Economy before the United Nations Conference on Environment and Development, the first Rio conference. It is only recently that the concept of green economy has been taken by China's leaders as a political consensus on the model of choice for the Chinese economy in this historical transformation.

The announcement made by President Hu essentially put an end to a debate on the choice of green economy versus low-carbon economy. In 2012, the State Council Development Research Centre, together with the World Bank released the report China 2030, which attempted to draft a blueprint for China's transformation toward 2030. This high profile report advocated the green economy as the direction for the Chinese economy to take. This report was released three months before the Rio+20 conference, with the President of the World Bank, Robert Zoellick, appearing before the media for the release. Considering the role of this influential think tank, as well as the influence of the World Bank, many believed that the green economy would likely become a central theme of the new administration. A few months later, green development, together with circular development and low-carbon development, was named as a key pillar for achieving ecological civilisation, a new term incorporated into the new Constitution of the Chinese Communist Party.

In fact, China is one of few countries in the world where a clear political consensus is built among the top leadership. This is not only very significant but also critically important for the success of policy-making and implementation on the new economic direction. In this chapter, we take a quick look at the long and painstaking process that has given birth to such a consensus. We focus on the challenges that China has faced and explain why green economy should not be considered as a fashion or even an option, it is a must to China. We cover some of the debates prior to Rio+20 and discuss the sticking points in the debate. We discuss the pilot programmes set forth by the Chinese government, with much international support and participation of non-governmental organisations (NGO). We try to provide an outlook of green economy in China. We realise this

is risky since the developments so far have been rapid and there are currently many uncertainties in the economic, social and political environment that cannot be seen clearly. For example, the economic slowdown and the government response could be either an opportunity or a jeopardising factor for the development of green economy.

2 Challenges and Approaches

Environmental consequences of economic development, resource scarcity, and global climate change are three major challenges that have forced China to adopt green economy as a choice of development model for environmental and economic sustainability and social harmony.

China's economic development is seen in the world as no less than a miracle.[1] For three consecutive decades, China's economic growth has maintained double digits measured by the rate of gross domestic product (GDP). Twenty years ago, when the world leaders met in Rio de Janeiro for the summit on environment and development, the West had not settled down from the jubilant mood brought by the collapse of the Berlin Wall, by having won the Cold War, and the victory of the Desert Storm. No one would have predicted that China would become the second largest economy in 20 years. In fact, few ever cared. But now China, second only to the United States of America (U.S.A.) in terms of GDP, is poised to surpass the U.S.A. and become the largest economy in possibly less than a decade.[2] It now has the largest trade volume with international partners, the largest foreign reserve, and is the largest owner of U.S. government bonds in the world. However, these seemingly encouraging achievements have not brought only positive outcomes. In fact, many are now more concerned than 20 years ago about the health and sustainability of the economy, and indeed the very health of the people who have to breathe filthy air, drink unclean water and eat unsafe food often, if not regularly. The environmental consequences of the three decades of rapid economic development have been devastating. An authoritative assessment report on the environment of China concluded that China faced an

1 Justin Lin discussed the Chinese economic miracle in 1999 in his widely cited book. But the economic growth since the publication of the book is even more impressive.

2 There have been conflicting predictions. Part of the difference is due to the use of the exchange rate of currencies or the purchasing power parity (PPP). But it seems a consensus has emerged that the Chinese GDP would surpass that of the United States in the foreseeable future.

unprecedented challenge in the world.[3] Even after a successful implementation of the environmental policy and programme of the Eleventh Five-Year Plan (11th FYP), Premier Wen Jiabao warned that the environmental constraints on development had not been improved. Indeed, even in Beijing, the capital city of China where intensive funding was invested in environmental protection, the concentration of airborne particulates such as particulate matter consisting of fine particles that are 2.5 micrometres in diameter and smaller (PM2.5) is still way above the minimum standards agreed by experts. Ecosystem degradation has been astonishing from large-scale desertification from over-grazing to land settlement from coal mining. The environmental consequences of coal mining are devastating. Other costs of coal mining include destruction of the ground water aquifers, large-scale sediments of land, loss of primary vegetation, and loss of human lives (Mao et al. 2008). Coal burning has been the major source of sulphur dioxide and other airborne particulates. Environmental pollution has been a major cause for public social dissatisfaction and instability in recent years.

The rapid economic growth has also accelerated the use of natural resources, including land, minerals, energy, water and all types of ecosystems. Limited by the overall level of technology, the resource productivity of the Chinese economy is still much lower than that of developed countries. For example, the economic productivity of energy in China is about one third that of the U.S.A. and one eighth that of Japan.[4] As a result of this and intensified manufacturing, the Chinese economy is characterised by a high input of resources. Some resources thus suffered the danger of being depleted. In North China, the groundwater table has dropped by more than a hundred metres in 40 years. The groundwater table in Beijing dropped twelve metres in ten years from 1999 to 2009 according to the Municipal Water Bureau of Beijing (Wen 2012). China has about 30 percent of the world's rare earth resources, but accounts for 90 percent of the world supply. Mining of rare earth elements has caused major environmental degradation, and recent regulation of the extraction has caused international disputes as it was considered as the Chinese government controlling the world supply. Water resources in the Yellow River — considered as the mother river of China, for it has nourished the nation for thousands of generations — now seem insufficient for extraction by the cities and provinces along the river. In some years, the sit-

3 Research report for preparing the National Mid- and Long-Term Planning for Development of Science and Technology in 2005.

4 This was calculated using the exchange rate. A calculation by Augus Madisson based on PPP suggested that the economic efficiency of energy use in China was slightly higher than that of the U.S.A.

uation was so severe that all the water was used up, leaving no water flow reaching the ocean.

Finally, global climate change has become a major issue that is not only a domestic concern but has also brought international pressure for a shift towards a green economy. In fact, the issue itself did not immediately emerge as a priority issue on the national agenda for policy-makers. Climate change was initially treated as a scientific issue by the central government. In 1990, when the National Coordination Group on Climate Change was established as the first official institution on climate change under the State Council's Environmental Protection Committee, the focus was on learning and fact-finding. But later, the nature of China's climate change actions has been to adjust economic development, and thus the issue of climate change had become a strategic issue. This new understanding led to an important reorganisation of the top institutions. The emphasis on development and the strategic nature of the issue were further highlighted by the central government when the organisation was restructured and elevated into the National Leading Group on Climate Change led by Premier Wen Jiabao himself. Members of this group include almost all ministers of the central government. Climate change is closely linked to energy saving, and the energy-saving targets can be translated into carbon-saving terms. Thus, one may argue that China's climate protection actions coincide with its energy-saving efforts, which were first put in place for mostly domestic reasons. However, when the energy intensity target was most massively reinforced in the 11th FYP, domestic concerns and climate protection were both explicitly weighted, as signified in the formation of the two national leading groups called by the Chinese Premier (Qi & Wu 2013a).

Climate change impacts were the direct reasons for the elevation of the issue into top policy agenda. China's first National Assessment Report on Climate Change in 2007 concluded that China was among the countries most severely impacted by climate change (Editorial Committee 2007). It listed major negative impacts from agriculture to infrastructure, from urbanisation to industrialisation, from human health to land inundation. Extreme weather events had major impacts on the economy. The Fourth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) warned that the glaciers in the Himalayas would disappear in three decades, which generated a major concern among the public and policy-makers because a large portion of the Chinese population relies on the rivers that originate from that mountain range.[5]

5 This claim of the IPCC was later withdrawn, but public awareness of climate change had been raised.

International pressure played an instrumental role in pushing the climate change and green economy agenda in China. Following the release of the Fourth Assessment Report by the IPCC in 2007, a wave of reporting on climate change emerged in the Chinese media. Many seminars and workshops were organised by NGO's and research institutions. Chinese embassies and consulates worldwide received, for the first time, numerous calls and questions regarding Chinese actions on climate change. This was the time when China was about to surpass the United States as the largest greenhouse gas emitter. International negotiations under the United Nations Framework Convention on Climate Change and the Kyoto Protocol were intensified as the end of the Protocol's first commitment period came close. The public interest and international pressure urged the leaders of the central government to reconsider the issue of climate change. Green economy is considered a path that could balance economic development and climate protection.

3 Progress and Need for Greater Efforts

China has achieved a staggering feat of industrialisation over the past three decades. Rapid economic growth has lifted hundreds of millions from poverty but also made the country a major contributor to global climate change. This has prompted the government to prioritise low-carbon development as a key policy objective. On 8 September 2007, Chinese President Hu Jintao told his counterparts at the Asia-Pacific Economic Cooperation Summit that China would develop a low-carbon economy. Since then, China has made significant progress towards low-carbon development. The recent Twelfth Five-Year Plan adopted in 2011 outlined ambitious targets for energy intensity reduction, renewable energy investments, and other 'green' initiatives. Recent achievements and trends offer grounds for optimism in China's ability to meet these goals, but secular factors also suggest that significant challenges lie ahead.

In 2010, China's annual carbon dioxide emissions reached 6.88 billion tonnes, an increase of approximately 5.5 percent on the previous year. It was also 21.9 percent higher than the quantity of U.S.A. emissions for the same period, and the gap between the two countries will widen as per-capita levels converge. By 2015, the final year of the Twelfth Five-Year Plan (12th FYP), China's total emissions are expected to top 8.46 billion tonnes, 49 percent higher than the projected U.S.A. level (Qi 2011). A large percentage of the estimated increase will derive

from the burgeoning consumption sector. Although these industries currently account for 30 percent of total emissions, their share has grown faster than the aggregate and will continue to expand as the economy shifts to a consumer-driven model of growth — another goal of the 12th FYP.

While the volume of carbon dioxide emissions has risen substantially, China succeeded in reversing the previous half-decade trend of rising energy intensity measured in carbon dioxide emissions per unit of GDP during the period of the 11th FYP (2006–2010). Compared to a baseline with energy intensity remaining at the 2005 level, the 11th FYP registered a 19.1 percent decline in intensity, slightly short of the 20 percent target set by the government. This change is equivalent to avoiding 1.55 billion tonnes of carbon dioxide emissions. Nonetheless, the Chinese economy's energy intensity remains high compared to developed nations. From a technical standpoint, this means there is still substantial room for improvement, and the government has aimed to further reduce carbon dioxide intensity by 17 percent in five years from 2011 to 2015.

The Chinese government has begun to place greater emphasis on the 'quality' of economic growth, with explicit reference to environmental concerns. Nonetheless, maintaining high GDP growth (at an average rate of seven percent from 2011 to 2015) remains the overriding policy imperative. At subnational levels, this target is seen as even more of a binding mandate because contribution to GDP is the benchmark of administrative success. Thus, local policy-makers are likely to prioritise growth targets over emissions reductions, as seen in the 12th FYP's objectives for provinces and municipalities. The incentive structure needs to better align the prerogatives of regional authorities with national low-carbon goals. There have been some positive signals to this end in recent years. Some regional policy-makers have begun to place greater emphasis on low-carbon development, motivated by increasing central government pressures, international market incentives, as well as administrative changes and more palpable climate change impacts at the local level (Qi & Wu 2013b).

4 Piloting Low-Carbon Green Economy

China decided to explore more effective policies and practices through a bottom-up approach that began with a local piloting programme, with help from international partners, such as the British government and the United Nations Development Programme. The pilot programme for low-carbon, green devel-

opment was closely linked to China's top-down effort to transform its economic development model into a sustainable one.

In early February 2010, the Chinese provincial leaders were called to Beijing for a week-long collective study, with the President, Vice President, Premier and Vice Premier giving lectures. The top leaders all emphasised the importance of accelerating the transformation of China's economic development model, and asked the provincial leaders to come up with new ideas and practices for the transformation. Two weeks later, the politburo got together for a special session of collective study on climate change. President Hu Jintao urged the politburo, the top decision-making body of the Chinese political leadership, to take climate change action as an opportunity for transforming China's economic development model. Six months later, in August 2010, the National Development and Reform Commission (NDRC) designated five provinces and eight cities as the first round of pilots for low-carbon development. The five provinces included Guangdong, Hubei, Liaoning, Shaanxi, Yunnan, and Hainan; and the eight cities Tianjin, Chongqing, Xiamen, Shenzhen, Hangzhou, Nanchang, Guiyang, and Baoding. These pilots covered a wide range of localities in terms of geographical distribution and economic development.

All pilot provinces and cities have been enthusiastic about participation. Each of them has completed a low-carbon development plan that normally covers such sectors as energy, industry, buildings, transportation, agriculture and forestry. Both production and consumption are parts of the plan. A greenhouse gas emission inventory is a key element in every pilot. Local governments are responsible for funding the pilot programme. It is interesting to see that each pilot province or city did not develop its programme from scratch; rather, it based the low-carbon programme on previous related programmes. For example, the city of Baoding developed its low-carbon development plan around its clean energy industry, highlighting manufacturing and using solar photovoltaic panels, wind power turbines, and associated equipment. Guiyang, capital city of Guizhou Province, was known for its development of a circular economy, and its low-carbon pilot programme was built based on circular economy projects. Hainan Province, the southernmost island known for its natural beauty, biodiversity, and tourism facilities volunteered itself for low-carbon development. Its low-carbon plan focussed on preservation, and using the green island and its resources for sustainable development. In general, none of the pilots were just for 'low-carbon' per se, rather they tried to be comprehensive in a low-carbon, green development, consistent to Beijing's call for transforming the economic develop-

ment model. Low-carbon is treated as a key aspect of green economy as defined and advocated by the UNEP (2011).

In addition to the 13 low-carbon pilots, the NDRC also created a pilot programme on the carbon market, mimicking the European Union Emissions Trading System in the general concept. The carbon trade pilot programme covers seven pilots including two provinces (Guangdong and Hubei) and five cities (Beijing, Tianjin, Shanghai, Chongqing, Shenzhen). Except for Beijing and Shanghai, all five others are themselves low-carbon pilots as well. These local pilots were encouraged to come up with innovative designs that fit their own localities. It is planned that a nationwide system of carbon emissions trading would be established during the 13th Five-Year Plan Period (2016–2020). All pilot provinces or cities have established their emissions trading platforms. Guangdong, Beijing and Shanghai have reportedly started some actual trading. However, most of the system design, including designs for the rules, is in process. The real results of this carbon emissions trading are yet to be seen. Already some experts and government officials have found that the most important feature of the first round of local low-carbon pilots is emissions trading, while others focussed on the low-carbon development plans and measures including funding allocation by the piloting provinces and cities (Qi 2013). Pricing carbon is considered as a key element for developing a green economy. The carbon market, aimed to create an effective carbon price, is brought in as a measure to increase the cost-effectiveness of achieving the decarbonisation targets.

It should be noted that these government backed low-carbon pilots are not limited in scope to 'low-carbon' per se. Instead, they are seen by the local governments as a pilot for a transformation of the economic development model. In short, these pilots are meant to explore ways of achieving a green economy. In fact, the national policy put together three adjectives — green, circular and low-carbon — to describe the new economy that meets the requirements of the ecological civilisation promoted by the ruling party. As such, more cities are enthusiastic about the second round of piloting programmes. Many more cities submitted their applications to be included in the second round, and many mayors came to Beijing to present their plans for implementing their low-carbon pilots.

In addition to the official programmes, there have been many other pilots. For example, the China Council of Low-Carbon Eco-Cities, a professional organisation under the Chinese Society of Urban Sciences, has been promoting various pilots on the concept of the low-carbon eco-city since 2008. The participating

cities convened in Tianjin in 2012 to form an alliance for developing low-carbon eco-cities. Despite the slight difference in terminology, the essence of their practices is to further the green development of cities, or to promote green economy, life-styles, and planning and design at the city level.

China's green economic development can be observed in the areas of natural resource management and ecological restoration. Shortly after the floods in the Yangtze River Basin in 1998, the Chinese government implemented a universal ban on the logging of primary forests. Since then, the government funded six major afforestation and reforestation programmes aimed at increasing forest coverage and ecosystem conservation. Over 43 million hectares of forest were planted in the last decade, an increase of almost a quarter in the space of ten years. The national forest coverage has increased to 20.36 percent, as compared to 16.55 percent a decade ago. Meanwhile, natural conservation efforts have also included ecosystem restoration of grasslands and wetlands. The government sponsored and funded numerous programmes. In the conservation of wetlands, 70,000 hectares of wetland has been restored and 550 wetland reserves have been established, including 41 international key wetlands and 213 wetland national parks. These have bolstered the extensive nature reserve system. By 2010, a total of 2,588 nature reserves were established, putting 149 million hectares under official conservation programmes. The total area of nature reserves is now 25 percent greater than the total area for food production in China.

Water conservation is of particular importance and therefore has been given great attention over the last two decades. According to the National Report on Sustainable Development released before the Rio+20 conference in 2012, China has, since 2001, established 300 pilot projects for building a water-saving society and raised the technological standards for water conservation in agriculture, industry and cities. As a result, water consumption for every thousand yuan of industrial added value dropped from 28.5 cubic metres in 2000 to 124 cubic metres in 2010, and water consumption per thousand yuan of GDP fell from 554 cubic metres in 2000 to 225 cubic metres in 2010 (The People's Republic of China 2012).

5 How Far Is China from a Green Economy?

China is now at the height of industrialisation and urbanisation. With growing private consumption and urbanisation, China will remain the world's most energy and resource-hungry economy for the foreseeable future. Concomitantly, carbon dioxide emissions will continue to rise as China enters middle-income status and beyond (Qi & Wu 2013b). Even though the economy has made up ground in decreasing energy-intensity, the gains in efficiency are not likely to catch up with the increase of total emissions. And while recent structural changes have contributed to a decrease in energy intensity, the redistribution of many energy-intense industries inland, accompanied by the rapid industrial expansion of central and western Chinese provinces, has locked in a high-emission infrastructure in certain parts of the county that will be difficult to improve in the near-future. With many of the 'low-hanging fruits' in efficiency gains already picked, returns on investment will progressively decline as marginal costs rise.

Some described the 12th FYP as China's green development plan. The green development goals of the 12th FYP are ambitious, and are distinctive in the prominence given to them by the government. For the first time, low-carbon development takes pride of place along with GDP growth as top priorities in Chinese economic policy; even if the coupling of the two is at times uneasy. This signals a serious commitment to meeting the demands of sustainability, even as debates continue about respective national responsibilities in global climate change mitigation. There remain daunting obstacles on the path to a low-carbon economy, but if China continues to build upon the achievements of the recently-concluded 11th FYP, the goals of the 12th FYP are certainly plausible.

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SOUTH KOREA – Green Leapfrogging: Korea's Accelerated Transition Towards Green Growth

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Since August 2008, when the Republic of Korea's President Lee Myung-bak proclaimed 'Low-Carbon Green Growth' as Korea's new national vision for the coming 60 years, Korea has experienced remarkable changes in its economy and environment. Over the past four years, Korea established its National Green Growth Strategy and Five-Year Plan to tackle climate change and the energy crisis, while creating new engines of green growth. The Framework Act on Low-Carbon Green Growth was enacted and enforced to effectively enable sustainable green growth. Furthermore, Korea has been allocating two percent of its gross domestic product (GDP) to a Green Budget in green industries. Through such dedicated commitment to green growth, Korea is now realising its vision of sustainable green growth. Vast expansion of investment in green industries, rapid growth of renewable energy industries, and green job creation demonstrate Korea's efforts. At the same time, environmental conditions such as air and water quality in metropolitan areas have significantly improved while Korea has strengthened its capacity to adapt to climate change.

1 Korea's National Vision of Low-Carbon Green Growth

Korea's national vision for low-carbon green growth shifted the existing development paradigm away from quantity-oriented, fossil fuel dependent economic growth, ignoring social and environment consequences (such as climate change, environmental sustainability and social equity). Instead, quality-oriented growth that relies on new and renewable energy resources is now favoured.

Taking this into account, Korea's green growth emphasises the crucial principle that economic growth and environmental sustainability are not merely compatible objectives, but are an intricately intertwined concept that will guarantee a more sustainable future. According to the Global Green Growth Institute (GGGI), "green growth is the new revolutionary development paradigm that sustains economic growth while at the same time ensuring climatic and environmental sustainability. It focuses on addressing the root causes of these challenges while ensuring the creation of the necessary channels for resource distribution and access to basic commodities for the impoverished. Under this new paradigm, new ideas, transformational innovations, and state-of-the-art technologies will become the major drivers for growth." (GGGI 2011) Significantly, Korea's path to green growth has been a unique one. Unlike most developed countries — whose green growth strategies are determined as a result of a path-dependent, evolutionary process — Korea's vision to transform itself to a green economic power primarily sprung from a conscious agenda of the political leadership that laid out bold and ambitious goals for a given time period.

Korea's quantitative growth driven by an extensive input of labour and capital has now reached the limits of growth without further employment opportunity (GGGI 2011). Furthermore, given that Korea imports 96.7 percent of its energy from overseas and has the fastest growing emissions among the member countries of the Organisation for Economic Co-operation and Development (OECD) (BRIE 2011), the concept of green growth is naturally attractive and also necessary for Korea. The Korean government sees promoting green growth as an opportunity to not only incorporate sustainability into the conventional economic growth framework by reducing carbon emissions, but also as a chance to further improve corporate competitiveness by greening and upgrading existing industries while nurturing green industries (BRIE 2011). Therefore, in addition to the economic considerations already detailed, energy security and climate change coupled with Korea's rapidly growing greenhouse gas emissions in the past 15 years are forcing Korea's hand. Korea must now develop new engines of growth in a more urgent manner. To overcome these challenges, Korea has had no choice but to change.

2 Establishing the Foundation for Green Growth

In January 2009, Korea announced the Green New Deal policy to create jobs and secure new growth engines. According to HSBC Global Research, Korea has introduced the most dedicated Green New Deal, with more than 80 percent of funds from its stimulus plan allocated to environmental themes (HSBC Global Research 2009). Soon after that policy in February 2009, a Presidential Committee on Green Growth (PCGG) was established. The purpose was to coordinate and promote the roles and interests of relevant government agencies, line ministries and private stakeholders to implement green growth policies and also to boost the government's efforts to participate in the international endeavour to reduce greenhouse gas emissions and worldwide reliance on fossil fuels.

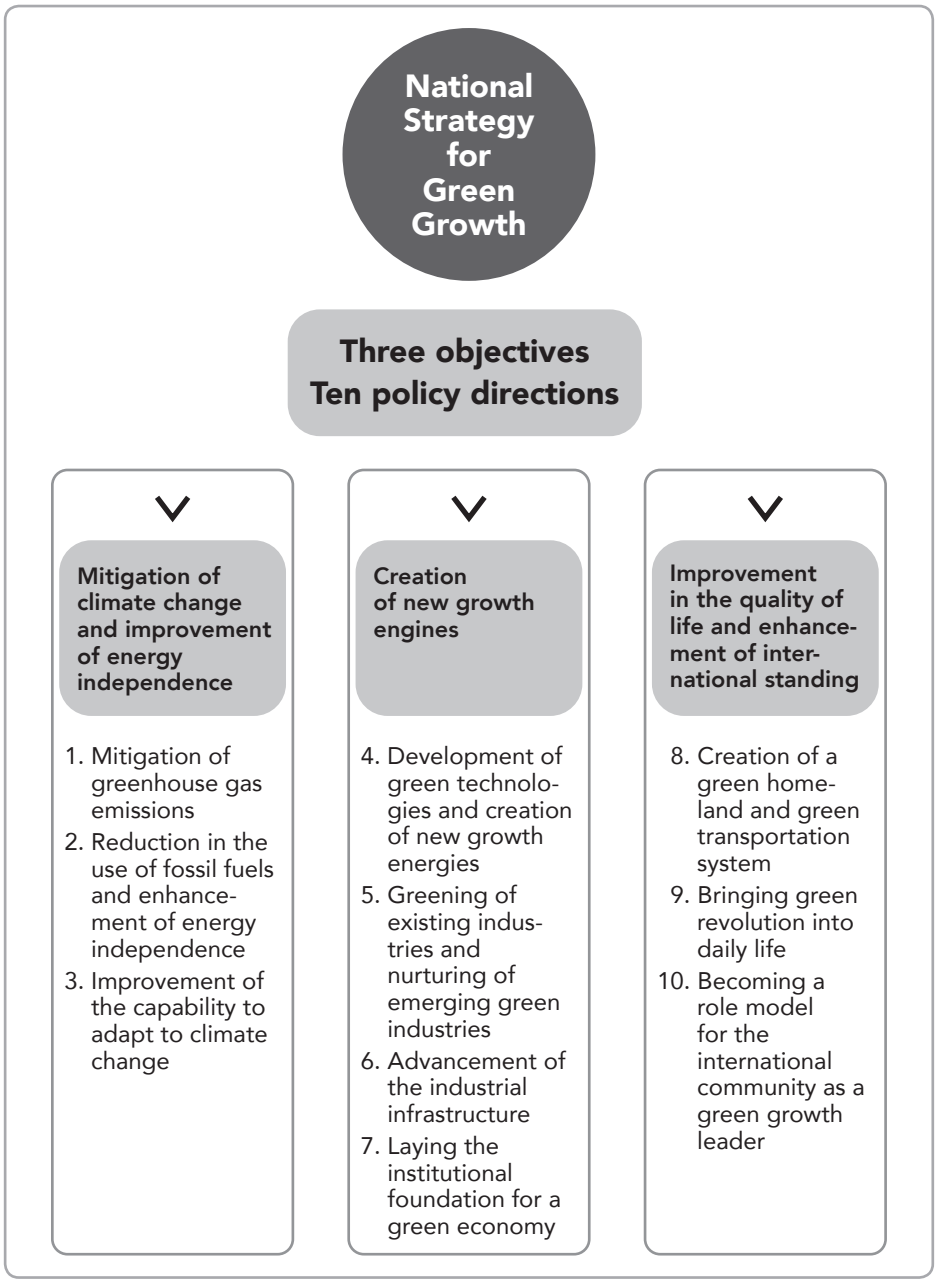
In July 2009, Korea announced its National Green Growth Strategy and Five-Year Plan (2009–2013), which were formulated to achieve the objective of becoming the world's seventh-largest green economic power by 2020 and the fifth largest by 2050. The National Strategy envisages three main objectives and ten policy directions as provided below in Figure 1. The three main components of green growth are: the mitigation of climate change and improvement of energy independence, the creation of new growth engines, and the improvement in quality of life and enhancement of international standing.

Table 1: Fiscal expenditure on green growth for 2009–2013 (trillion South Korean won, percent)

Category	Total	2009	2010–2011	2012–2013	Annual Average Rate
Total	107.4	17.5	48.3	41.6	10.2
Mitigating Climate Change and Promoting Energy Independence	56.9	8.6	29.2	19.2	14.0
Creating New Engines for Economic Growth	28.6	4.8	10.7	13.1	9.4
Improving Quality of Life and Enhancing Korea's International Standing	27.9	5.2	10.5	12.2	3.6

Source: PCGG, 2010b

Figure 1: Republic of Korea's National Strategy for Green Growth



Source: PCGG, 2012

Under the Five-Year Plan, the government would spend two percent of its annual GDP, approximately 107 trillion South Korean won (97 billion US dollar), from 2009 to 2013, in order to green the current economic structure of Korea. This is twice the figure recommended by the United Nations Environment Programme (UNEP), which recommended investing at least one percent of GDP (UNEP 2009). Table 1 above gives a more detailed account of fiscal expenditure on green growth from 2009 to 2013. As a sub-policy of the Five-Year Plan, Korea announced 27 green technologies that would generate approximately 481,000 jobs by 2012 and 1.18 million jobs by 2020 (UNEP 2010).

Moreover, the Framework Act on Low-Carbon, Green Growth was enacted and promulgated to provide a sustainable legal foundation to promote green growth in a comprehensive and systematic manner. At the United Nations Climate Change Conference in Copenhagen in 2009, Korea proposed its mid-term greenhouse gas mitigation target of a 30 percent reduction below business-as-usual scenarios, which was a voluntary pledge as a non-Annex 1 country.

3 International Green Growth Development

At the same time, the Korean Government realised the importance of international cooperation in expanding green growth, and, as part of its global green strategies, announced an increase to the Green Official Development Assistance from 14 percent in 2009 to 30 percent by 2020 (PCGG 2010). Additionally, Korea launched the East Asia Climate Partnership (EACP), which supports tackling climate change in developing countries and promotes green growth in Asia in five priority areas. Those five areas are (1) water resource management (2) waste management (3) low-carbon energy (4) low-carbon cities (5) forestry and biomass. In June 2010, the GGGI was established to support developing and emerging countries in pioneering a new green growth paradigm, taking into account each country's respective economic and social circumstances. GGGI transitioned into an international treaty-based organisation in October 2012. Currently GGGI is a unique multi-stakeholder, hybrid international organisation. GGGI focuses on green growth and bridging developed and developing countries as well as public and private sector representatives to spread green growth models.

4 Transition to Green Growth

According to the Ministry of Strategy and Finance and the PCGG, the Korean government allocated some 67.4 trillion South Korean won (62.9 billion US dollar) from 2009 to 2011 in support of green growth; a figure that is even larger than the targeted amount of 67.3 trillion South Korean won (62.8 billion US dollar) (Ministry of Strategy and Finance and PCGG 2012). Table 2 below shows the actual expenditure on green growth in comparison with the estimated spending from 2009 to 2013.

Table 2: The actual expenditure on green growth for 2009–2013 (trillion South Korean won)

	2009	2010	2011	2009–2011	2012	2013	Total
Five-Year Plan	17.4	24.2	25.7	67.3	20.6	19.4	107.4
Actual Expenditure	17.2	24.5	25.7	67.4	21.5	19.4	108.3

Note: 2012 expenditure is estimated budget, 2013 expenditure is estimated based on National Fiscal Management Plan. Source: Ministry of Strategy and Finance and PCGG

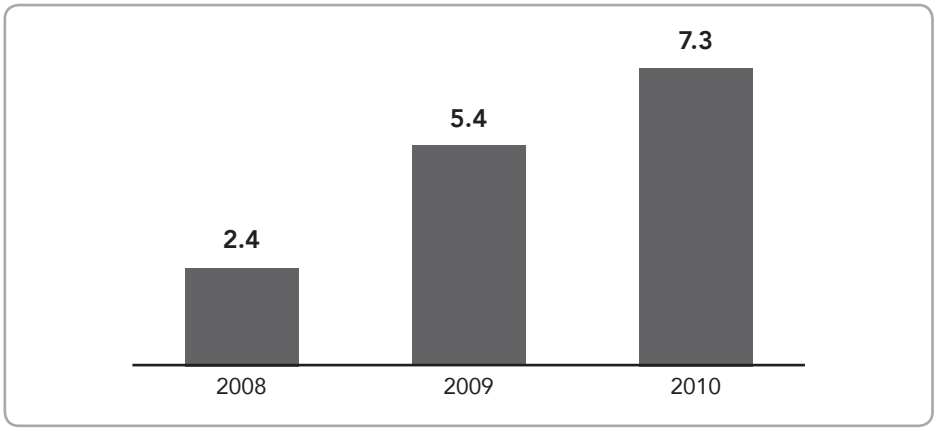
Recognising the importance of green technology, Korea has been making a special effort to facilitate investment in this area. Government research and development expenditure on green growth was increased from 16.5 percent in 2009 to 22.2 percent in 2012 as shown in Table 3 below. The table shows that, in 2012, research and development expenditure on green growth was 3.5 trillion South Korean won (3.2 billion US dollar), while the overall national research and development expenditure was 15.9 trillion South Korean won (14.8 billion US dollar).

Table 3: Research and development (R&D) investment on green growth (trillion South Korean won, percent)

Year	Overall National R&D	R&D on Green Growth	R&D on Green Growth
2009	12.3	2.3	16.5
2010	13.7	2.5	18.3
2011	14.8	2.9	19.5
2012	15.9	3.5	22.2

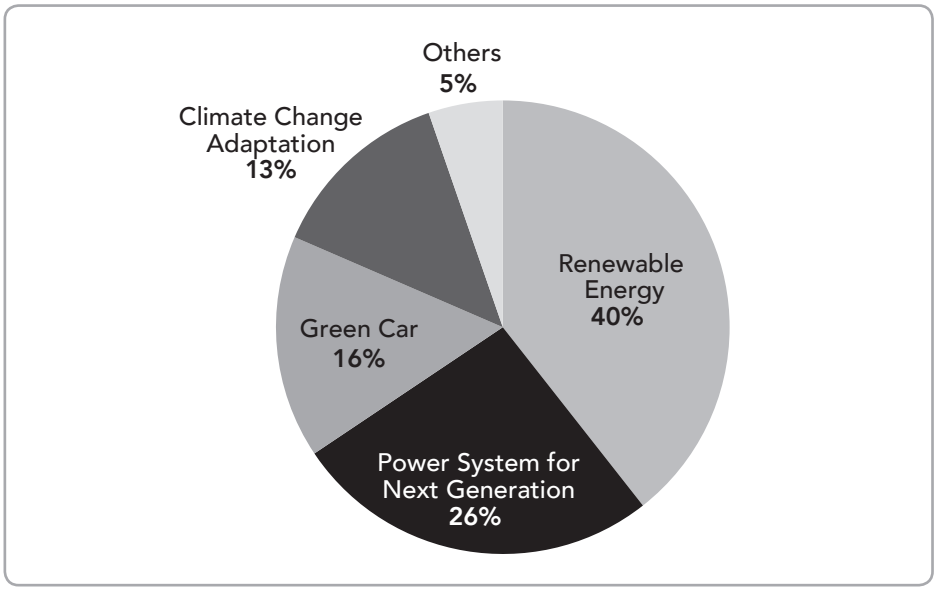
Source: PCGG

Figure 2: Green investment 2008–2010 (trillion South Korean won)



Source: PCGG

Figure 3: Composition of green investment 2008–2010 (percent)



Source: PCGG

Focusing on business sectors, according to the PCGG, Korea's 30 business groups have already invested more than 15.1 trillion South Korean won (14 billion US dollar) in the green sector, with about a 74.5 percent annual increase over one year. The figure started at 2.4 trillion South Korean won (2 billion US dollar) in 2008, then went to 5.4 trillion South Korean won (5 billion US dollar) in 2009, and jumped even higher to 7.3 trillion South Korean won (6.8 billion US dollar) in 2010 (PCGG 2012). Figures 2 and 3 above show the actual investment in green industries from 2008 to 2010 as well as the sectors in which the 15.1 trillion South Korean won (14 billion US dollar) were actually invested. Looking forward, these top business groups are projected to have invested another 22.4 trillion South Korean won from 2011 to 2013, an increase of 48.2 percent over the three previous years (PCGG 2012).

The renewable energy sector has also grown remarkably, having expanded about 2.2 times in terms of its total business, 3.7 times in terms of employment, 6.5 times in terms of sales, 7.3 times in terms of exports and 5.1 times in terms of private-sector investment (PCGG 2012).

Furthermore, as a result of green investment and other efforts, the Korean Development Institute and the Korea Labour Institute recently estimated that about 1.18–1.46 million jobs will be created as a result of the implementation of the Five-Year Plan. In addition, according to the PCGG, the number of green industry-related businesses has increased drastically from 51 in 2009 to 160 in June 2011 (PCGG 2012).

In March 2012, HSBC Global Research ranked Korea second after China, after China, as the country with the most rapid growth in green industries during the period of 2005–2010 (HSBC Global Research 2012). Also, it estimated that, in terms of climate-smart exports, Korea has moved from number 15 in 2005 to number seven in 2010, and will move to number four in 2015, displacing Japan (HSBC Global Research 2012).

5 Challenges and Approaches

In order to realise the vision of low-carbon green growth, Korea has successfully laid out the necessary institutional framework — yet it has further still to go and will face challenges. Importantly, Korea will need to sustain the current level of support for green growth from the political leadership to further achieve its goals and targets.

Firstly, in order to meet its ambitious target to reduce greenhouse gas emissions by 30 percent compared to business-as-usual levels by 2020, Korea will have to make continued efforts. While a target management scheme for greenhouse gas emissions and energy consumption was introduced in 2010 to ensure reductions by significant emitters, Korea will need to effectively manage this national system.

Secondly, while Korea is currently preparing to introduce the Emission Trading Scheme, which passed through legislation in May 2012 and is expected to begin in 2015, Korea must make sure it introduces the scheme in the most effective and efficient manner possible. Legislation should help lower the overall national cost of emissions reductions, however, it should not hurt export competitiveness (BRIE 2012).

Korea's green growth performance, evaluated using OECD measurements and indicators of environmental and resource productivity (such as carbon dioxide emissions productivity, energy productivity and domestic material consumption intensity), has improved in a long-term perspective. Data shows that the decoupling of environmental pressure from economic growth is underway, however, a lot more is desired (OECD 2011).

According to the PCGG and the Ministry of Environment's evaluation of Korea's green growth achievements in the three years since 2008, areas of concern are: the involvement of private citizens, and the result of government implementation. The citizens would need a tax reform to guide a voluntary and tangible reduction in greenhouse gas emissions. Also, businesses and homes need to be targeted in awareness campaigns to help green implementation into everyday life. Looking at the government, despite all efforts, energy consumption has continued to increase; energy consumption in 2010 increased by 6.7 percent and it even surpassed the rate of economic growth (6.1 percent) in the same period (PCGG 2012).

Importantly, the Korean government currently does not have any official, comprehensive evaluation manual to properly study and evaluate the various green growth initiatives and their effectiveness. Sporadic endeavours have been detected from several branches of the government and research communities. However, a systematic, orchestrated, and refined national-level effort is still needed.

6 Concluding Remarks

The green growth paradigm is more than just a development strategy; it is modifying peoples' behaviours and ways of thinking about their participation in society and a rapidly changing environment. Korea, as an early-adopter of green growth, will need to continue its effort towards green growth. It should further boost green industry and green jobs, while ensuring global leadership on green growth through more proactive collaboration among green growth-related institutions. Experts say that first and foremost Korea should effectively introduce an emission trading scheme.

Many countries worldwide are leading the way towards green growth as a global solution to current climate and environmental challenges, and Korea has its own high level of commitment making green growth a top national agenda. Korea knows that green growth can be a leapfrogging strategy for other countries, especially developing countries, to strengthen both their environmental and economic development. Korea's unique case of transitioning from an emerging economy to a developed one positions it well to lead other countries, especially developing countries, by promoting green growth strategies in pursuit of sustainable global development.

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SINGAPORE – a Red Dot Towards a Green Economy?

How to Cushion the Impact of the Financial Crisis While at the Same Time Bringing Forward Plans for Greening the Economy

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Helena Varkkey*, Ph. D. (University of Malaya)*
and ***Jun Yi Ong*** *(University of Sydney)*

1 Introduction

The island city-state of Singapore was among the Southeast Asian nations that were hit by the global financial crisis in 2008. That year, global demand for trade and investments worsened, affecting important sectors in Singapore such as wholesale and retail, transport and storage, as well as manufacturing (Table 1) (Department of Statistics Singapore 2012). As a result, Singapore's economy grew by only 1.7 percent in 2008, as compared to 8.8 percent in 2007. In 2009, Singapore experienced negative growth together with other Southeast Asian countries (Table 2) (World Bank 2012).

This chapter focuses on the importance of the green economy for Singapore and highlights its relevance during the financial crisis. Being a small open economy that relies on international trade, Singapore had little chance of averting a downturn during a financial crisis, regardless of the amount of money the government pumped into the economy (Quah & Ong 2009). The chapter details the Singapore government's pragmatic approach of cushioning the impact of the financial crisis while bringing forward its plans for green and low-carbon development, arguing that protecting the environment and the pursuit of economic growth do not always have to be a zero-sum game.

Table 1: Share of Singapore gross domestic product (GDP) by industry

Singapore gross domestic product by industry Percentage change over corresponding period of previous year				
	2008	**2009**	**2010**	**2011**
GDP at 2005 market prices	1.7	–1.0	14.8	4.9
Goods producing industries	–1.5	–1.4	24.7	6.8
Manufacturing	–4.2	–4.2	29.7	7.6
Construction	20.1	17.1	3.9	2.6
Utilities	1.9	–0.2	6.7	2.1
Other goods industries	–4.3	–1.8	–3.1	3.0
Services producing industries	4.6	–1.0	11.1	4.4
Wholesale & retail trade	3.2	–4.7	15.1	1.1
Transportation & storage	5.1	–9.9	7.9	4.7
Accommodation & food services	0.9	–2.0	12.2	5.8
Information & communications	8.0	3.5	3.4	1.5
Finance & insurance	5.2	2.2	12.4	9.1
Business services	7.3	2.9	6.2	2.7
Other services industries	2.1	4.8	14.7	6.7

Source: Department of Statistics Singapore 2012

Table 2: Annual percentage growth rate of GDP at market prices based on constant local currency.[1]

Annual percentage growth rate of GDP				
Selected Southeast Asia country	**2007**	**2008**	**2009**	**2010**
Brunei Darussalam	0.15	–1.94	–1.77	2.60
Cambodia	10.21	6.69	0.09	5.96
Indonesia	6.35	6.01	4.63	6.20
Malaysia	6.48	4.81	–1.64	7.19
Lao PDR	7.60	7.82	7.50	8.53
Philippines	6.62	4.15	1.15	7.63
Singapore	8.86	1.70	–0.98	14.76
Thailand	5.04	2.48	–2.33	7.81
Vietnam	8.46	6.31	5.32	6.78

Source: World Bank 2012

1 Aggregates are based on constant 2000 US dollars. GDP is the sum of gross value.

2 Prospects for the Environment with the Financial Crisis

It can be considered essential not to neglect concern for the environment, especially during the global financial crisis (CIGI Working Group on Environment and Resources 2009). During a recession, creating jobs and jump-starting economic growth are paramount. With most resources channelled towards economic revival, many fear that nothing will be left for the environment. This presumption, however, is flawed. A global financial crisis would bring about a dip in global demand. This translates to lower production and consequently less pollution, less carbon emissions, and lower rates of resource depletion (Siddiqi 2000).

Investing in the environment is an economically sound decision during a financial crisis, as it brings about short and long term benefits. Lower global demand means transactions will be slow in most industries. This results in a lowering of the cost of raw materials. With lower opportunity cost, industries will have more incentive to incorporate energy efficiency considerations into the design of their industrial facilities, especially if there is financial support from the government. From the business perspective, undertaking such investments will lead to improvement in production efficiency and consequently lower business costs. This ensures that the business is kept at a competitive standing. Other benefits include enhancing energy security and reducing greenhouse gas emissions. These goals can be achieved together with the goal of job creation (Quah & Ong 2009). Therefore, the aftermath of a financial crisis is an opportune time to implement Green Economy instruments to accelerate the transition towards green and low-carbon societies and industries, and boost the economy via government expenditure.

3 The Green Economy Debate in Singapore

Singapore's unique position as a small but thriving island state creates the basis for an ongoing debate between balancing economic agendas and environmental concerns in the country. Singapore's geo-political limitations and socio-economic constraints have provided strong arguments on the limitations of a green approach to development (Lim 2009).

Geo-political limitations include Singapore's scarcity of natural resources and land-space for effective renewable energy resources. Given Singapore's small size

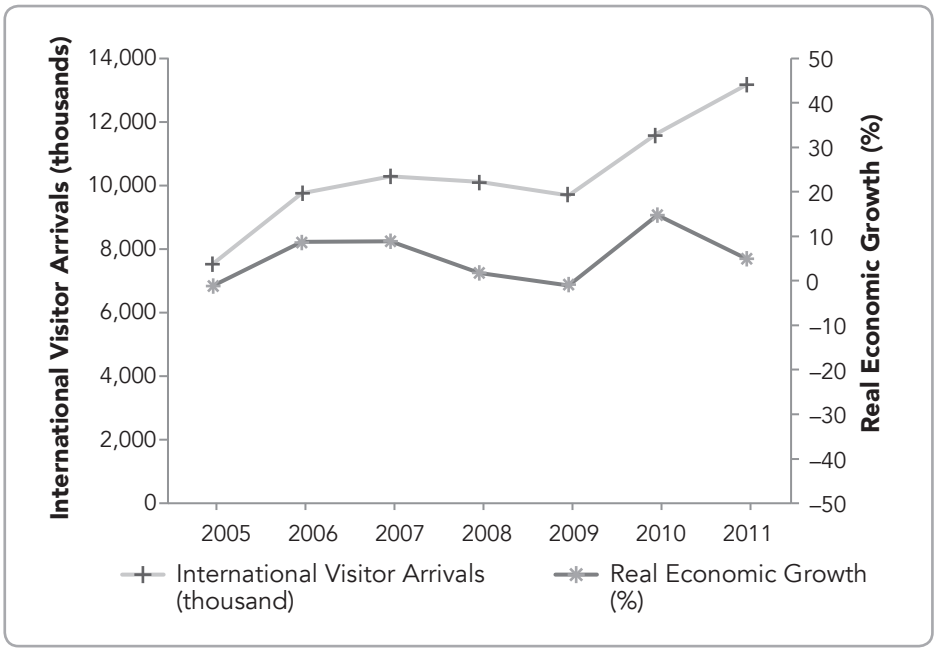
and dense urban landscape, there are challenges to the use of alternative energy sources such as solar, geothermal, or hydroelectric energy. Singapore's socio-economic constraints include its vulnerability as a small nation and its high dependence on an open economy that is fossil fuel intensive. Historically, Singapore's strategic geographical position along the East-West trade routes have made Singapore a natural location for oil storage and refining facilities serving the region. This refining and petrochemical sector accounts for a large source of Singapore's carbon emissions (National Climate Change Secretariat 2012).

Despite this, a high-quality living environment has continuously been the vision for Singapore. Singapore's development as a 'Clean and Green' city is the result of decades of deliberate planning and efforts since Independence in 1965 (National Climate Change Secretariat 2012). The first Prime Minister of Singapore, Lee Kwan Yew, was determined to set Singapore apart from the rest of Southeast Asia (Lee 2000). Lee envisioned a scene whereby the stability of the country was portrayed through cleanliness and greenery all across the city. This stability would lead to an increase in foreign interest in Singapore, and hence promote economic growth. Lee identified a Clean and Green Garden City of Singapore as a vital competitive factor to attract foreign investments to the country (Kachingwe 2007).

The ubiquitous Lee was thus instrumental in shaping Singapore's developmental policies. In accordance with Lee's vision, environmental issues have always been placed at the forefront of development over the past five decades as Singapore strived to become a modern and globalised cosmopolitan city-state. Policies therefore have purposefully been designed to create a clean and green Singapore amidst attempts to create higher standards of living (Lim 2009). But while the economic agenda in this clean and green approach remained central, Lee continued to maintain the 'environmental purpose' of the approach, citing aestheticism, pragmatism, and social concerns. The preservation of nature reserves and the design of manicured greenery was emphasised for environmental sustainability.

The idea of the Clean and Green Garden City of Singapore was first officially documented within the second reading of the Environmental Public Health Bill of 1968, where it was stated that the goal of the government was to improve the quality of the urban environment as well as to change Singapore into a Garden City (Waller 2001). This was the basis for the Environment (Public Health) Act, 1968, which set out long-term plans to achieve a high-rise and compact urban density, within a clean and green environment (Waller 2001). It later led to the

Figure 1: Singapore's international visitor arrivals and real GDP growth

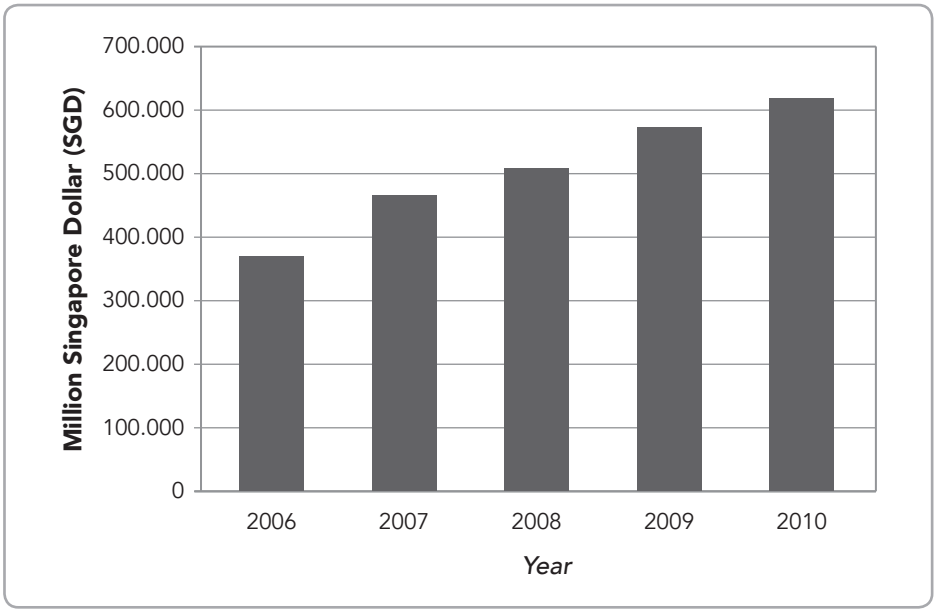


Source: Department of Statistics Singapore 2012

establishment of Singapore's Ministry of the Environment and Water Resources (MEWR) in 1972, especially significant because few countries in the world at that time had government administrations that dealt with environmental issues (Savage & Kong 1993). Since then, this concept has developed into a comprehensive programme of 'the greening of Singapore', which is executed through the Clean and Green Movement (Lee 2008, Yeh 1989). The Clean and Green Movement included measures such as tree-planting, the allocation of green spaces for nature reserves, increasing green recreational and leisure spaces within the urban environment, neighbourhood parks and park connectors (Ong 2012).

This reveals the government's focus on the 'economy of experience', an idea that was initiated by Lee along with the Garden City concept (Ong 2012). The experiences possible in these green spaces allow these spaces to be marketed in order to attract visitors, and to keep the economy competitive. Tourists have often identified Singapore's clean and green environment as a unique aspect of the country (Hui & Wan 2003). The attraction of visitors to the country is often followed by economic benefits as visitors are encouraged to increase their time

Figure 2: Increasing FDI into Singapore over the years



Source: Department of Statistics Singapore 2012

and expenditure in the city. Indeed, there has been a strong correlation over the years between international visitor arrivals and real economic growth in Singapore (Figure 1) (Department of Statistics Singapore 2012).

As a result, these experiences also attract professionals and skilled labour from all over the world to settle down in Singapore, further contributing to the local economy. Ensuring that the city remains attractive to the creative class is important in order to ensure continued economic growth, especially for a city like Singapore given the scarcity of natural resources and land (Peck 2005). In The Flight of the Creative Class by Richard Florida, the "creative class" refers to a particular sector of the world population that "accounts for nearly half of all wage and salary income", which is "as much as the manufacturing and service sectors combined" (2005, p. 7). Thus, the increase in expatriates, who largely belong to the creative class, can be considered to have contributed to an increase in foreign direct investment (FDI) in Singapore (Figure 2) (Department of Statistics Singapore 2012).

Singapore's early adoption of the green 'experience economy' shows that Singapore was one of the early movers in the implementation of the Green Econ-

omy strategy. The green 'experience economy' is where people are engaged in activities that will form 'memorable experiences' created with greenery, thereby boosting the economy (Pine & Gilmore 1998). This substantiates the close relationship between FDI and the Green Economy strategy in attracting the creative class.

4 Environmental Policies During the Recession

A continued dual focus on reviving economic growth and sustaining the environment through Green Economy instruments was evident in Singapore's policy strategies during the recession. As discussed earlier, the green economy approach in Singapore is more than an environmental policy; it also addresses the social and economic issues of the country. The Singapore government adopted a pragmatic approach of cushioning the impact of the financial crisis while bringing forward its plans for a green economy and low-carbon development (Quah & Ong 2009).

The green experience economy, as discussed in the previous section, has continued to be an important strategy in riding over the effects of the global financial crisis. Recently in 2009, Singapore allocated 695 million Singapore dollar to further aid the transformation of Singapore into a 'City in a Garden' by constructing Gardens by the Bay, building a park connector network and promoting sky rise greenery (Government of Singapore 2009). The Gardens by the Bay development at Marina South exemplifies an environment created for the green experience economy. The development consists of two conservatories — a cool/dry conservatory and a cool/moist conservatory — for displaying plants from the Mediterranean and Tropical Montane regions respectively (NParks 2011). In addition to the conservatories, the Super Trees vertical gardens, which are constructed tree structures that allow plants to grow vertically against them, also form key attractions of the Gardens in the midst of the Central Business District's urban setting (NParks 2008). In this way, the Gardens become a theme park for locals and tourists to enjoy. These new developments exemplify greenery as a form of aesthetics and as an image for the economic benefit of the city, alongside its ecological advantages.

To further complement the green experience economy, the Singapore government in 2009 allocated 24 million Singapore dollar to developing the Active, Beautiful and Clean (ABC) Waters Programme which would help transform

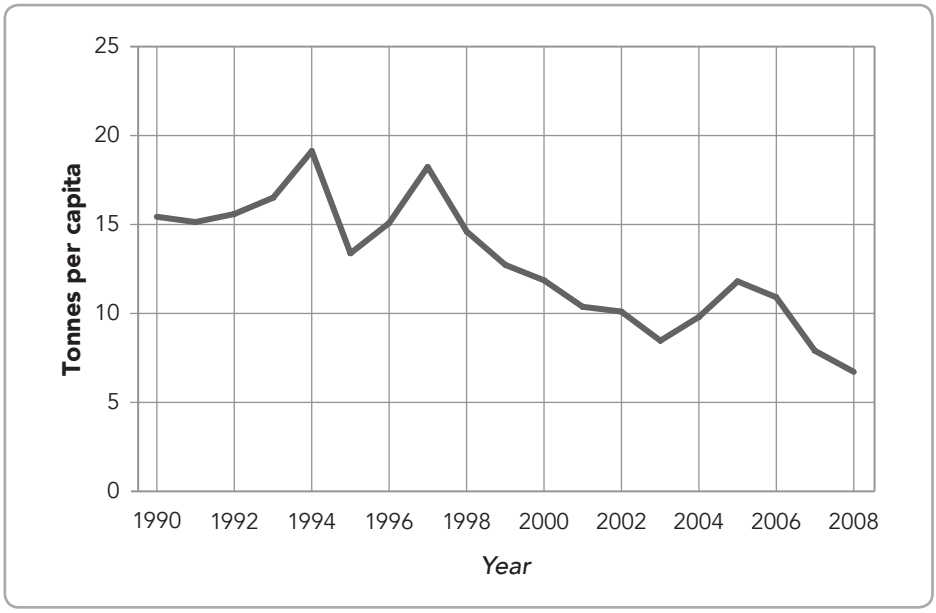
Singapore into a City of Gardens and Water (Government of Singapore 2009). These projects were envisioned not only to provide leisure space but also beautify the city-state and reduce urban heat. Residents and tourists would thus spend more time on leisurely pursuits, visiting parks and enjoying recreation. In this way, it was hoped that some locals would even become healthier and thus more productive when economic growth resumes. All these developments were envisioned to benefit the Green Economy (Quah & Ong 2009).

The expansion of the green experience economy during this time also brought about renewed interest in low-carbon development. The discourse on low-carbon development that was adopted in Singapore engaged with climate change by complementing it with economic advancements. Hence, the National Climate Change Strategy (NCCS) was released by the Singaporean government in 2008, with an underlying aim to increase the cost-competitiveness of the Singaporean economy (Hamilton-Hart 2011). The NCCS re-emphasises the Singapore government's approach to tackle the social and economic issues, through environmental development policies that focus on creating a Clean and Green Garden City (Ong 2012). As expressed in the NCCS, "A quality living environment enhances Singapore's living standards as well as our attractiveness to investments that grow our economy and provide jobs. A clean environment with low pollution also reduces health and related problems for our people. A well-tended environment is an ongoing investment that will benefit our current and future generations". (National Climate Change Secretariat 2012)

In relation to this, energy efficiency was envisioned to result in lower electricity usage and thus cost of living, while at once lowering Singapore's carbon emissions (Lim 2009). Emission reductions were targeted through limiting transport growth, making use of natural gas, which is the cleanest fossil fuel available for electricity production, as well as recycling more than half of Singapore's waste, while incinerating the rest to provide electricity and reduce methane emissions from its landfill (Quah 2010).

Continuing in this spirit, the government pledged in 2009 to spend one billion Singapore dollar over the next five years on energy efficiency initiatives. This includes promoting energy efficiency in industries and households through price-based initiatives, investing in green transport, and the greening of living spaces (Economic Development Board 2012). Other related policies aim to promote new sources of GDP growth by developing 'clean energy' industries and attracting renewable energy firms to set up their plants in the country under the Clean Development Mechanism of the Kyoto Protocol (Hamilton-Hart 2011).

Figure 3: Singapore's carbon dioxide emissions (tonnes per capita)



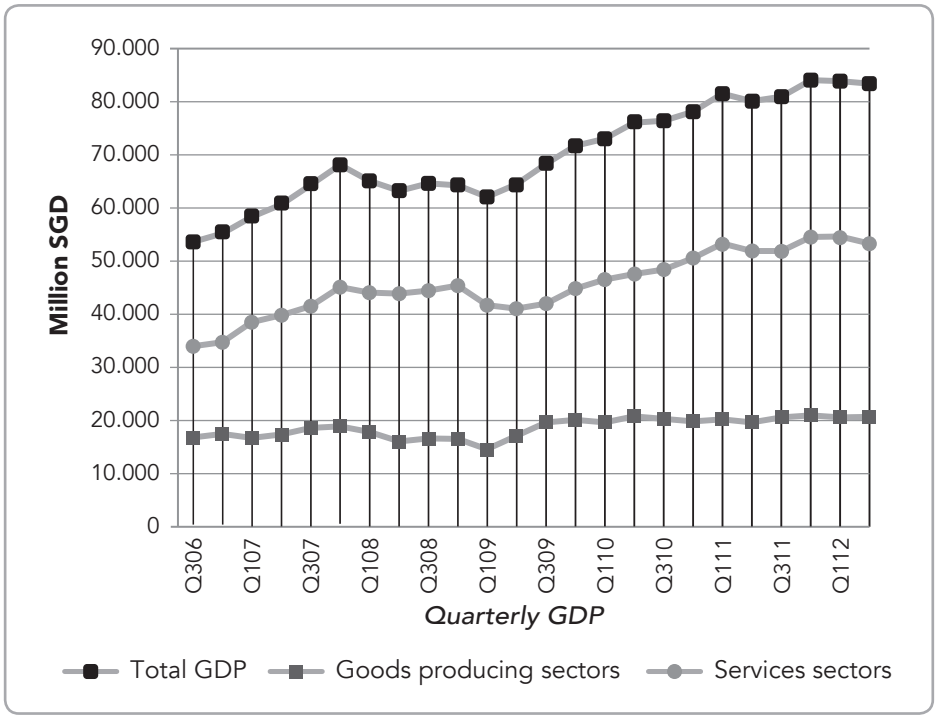
Source: World Bank 2012

Furthermore, Singapore set aside 18.9 million Singapore dollar in 2009 to promote energy efficient technologies and measures, develop energy efficiency capability and raise awareness of energy efficiency among businesses and the public (Government of Singapore 2009). Singapore's promotion of clean energy industries and technologies is pursued on a commercial basis, with the promise of energy security alongside generating jobs and profits in the long term (Hamilton-Hart 2011). As a result of these policies, Singapore's carbon intensity has reduced by 30 percent since 1990 (Figure 3) (World Bank 2012).

Hence, although the financial crisis in Singapore was adverse in causing recession and unemployment, it provided opportunities for further transformation towards sustainable development in the country. Far from causing ecological damage, the consequences of the financial crisis can be seen as positive for the environment (Quah & Ong 2009).

Consequences for the economy can also be seen as positive. For example, the impact of the financial crisis on employment was much more muted that in previous downturns, undoubtedly helped by job creation through initiatives for clean energy industries, among other budget stimulus initiatives in the 2009 and

Figure 4: Singapore's quarterly GDP indicators showing economic contraction and growth during the global financial crisis



Source: Department of Statistics Singapore 2012, Ministry of Trade and Industry 2012

2010 year budgets (Wilson 2011). By 2015, the clean energy industry in Singapore is expected to contribute 1.2 billion US dollar to the country's GDP and create 7,000 jobs (Yap 2010). Jobs are already being created at a high rate, as evidenced in a recent study which reported that Singapore averaged 1,200 postings on popular regional job search websites to fill vacancies for 'green jobs' (Asia Business Council 2009).

As a whole, Singapore escaped relatively unscathed from the global financial crisis as far as the direct financial fallout is concerned, with Singapore rebounding quickly in the second quarter of 2009 onwards after only five quarters of almost sequential contraction in the GDP (Figure 4) (Department of Statistics Singapore 2012, Ministry of Trade and Industry 2012). By April 2010, Singapore had recovered all the output lost since the beginning of the recession in the first quarter of 2008 (Wilson 2011).

5 Singapore at Rio+20

The United Nations Conference on Sustainable Development in 2012 (Rio+20 conference) put forward the concept of the Green Economy as a strategy to move a world still mired in financial and economic crisis towards sustainable prosperity for the future (Holmes 2012). Hence, Singapore's pragmatic approach of cushioning the impact of the financial crisis while sustaining the environment through Green Economy instruments was well received at Rio+20. Also, with the subject of sustainable cities garnering much attention during the conference, Singapore's achievements as a sustainable city-state were viewed as exemplary. Dr. Vivian Balakrishnan, Singapore's Minister of the Environment and Water Resources, was invited to share Singapore's experiences towards a Green Economy at two Rio+20 side events (SG Press Centre 2012).

Indeed, Singapore's unique position as an island city-state provided many opportunities for transition to the Green Economy. By being at once a city and a state, the Singapore government has authority over both city-level issues such as transportation and waste, and also national level issues such as taxes and subsidies, making it comparatively easy to plan and implement policies for a Green Economy. Furthermore, Singapore's small size made it easier and cheaper to provide services such as piped water, public transport, and sanitation, and also encouraged it to be greener. Its lack of resources in turn has prompted Singapore to find innovations in water purification and recycling. And unlike bigger countries, Singapore does not have the luxury of available land space to allow dumping waste, which is polluting. Through policies to preserve land for greenery and creating a 'City in a Garden', Singapore was successful in its long term plans to achieve a high-rise and compact urban density, within a clean and green environment (Environment [Public Health] Act, 1968, cited in Waller 2001). As a result, 47 percent of Singapore is green (Quah & Varkkey 2012).

Dr. Balakrishnan repeatedly stressed the importance of a cost-effective mindset in implementing the Green Economy, noting that the outcome of the Rio+20 conference of promoting Green Economy strategies fits nicely within Singapore's existing pragmatic framework. He explained during Singapore's National Statement at the conference that "Today, Singapore is a clean and green city, with our integrated urban planning approach, but this has required a careful and judicious balance between economic and population growth, together with environmental protection" (Balakrishnan 2012).

Indeed, as advocated at Rio+20, Green Economies should be capable of achieving more job opportunities, greater social equity and less poverty than conventional strategies. For example, research on green jobs conducted by United Nations Environment Programme and its partners in the lead-up to the Rio+20 conference showed that in green investment scenarios, agriculture, buildings, forestry, and transport sectors would see job growth in the short, medium, and long term exceeding their comparable business as usual scenarios. Allocating a minimum of one percent of global GDP to further raise energy efficiency in these sectors will create employment gains to exceed business as usual, which would be constrained by resource and energy scarcity. Indeed, countries moving towards a green economy like China and the Republic of Korea are already seeing significant employment creation (UNEP 2011). Furthermore, these job opportunities need to match the requirements of decent work, including such aspects as a living wage, the elimination of child labour, occupational health and safety, social protection, and freedom of association, which would bring about greater social equity and less poverty compared to business as usual scenarios (UNEP 2011). At the same time, sustainable economies can also make an important contribution to environmental protection by lowering greenhouse emissions (adelphi 2012).

Along these lines, Singapore has placed great importance on environmental planning and management, whereby issues of pollution and climate change are under careful mitigation, greeneries have been well laid out in the urban context, and well thought out environmental programmes exist. However, Singapore's pragmatic strategy towards a Green Economy in the aftermath of the global financial crisis is not without its potential problems. Actual attitudes of the government and residents towards environmentalism are questionable (Lim 2009), as Singapore's increasing concern for the environment and subsequent policy changes are economically driven. They therefore may not actually reflect changes in attitudes towards environmental issues.

For example, in the process of developing the green experience economy in Singapore, there is concern that too much priority is given to economic growth, and environmental topics are often accepted only when they are deemed as not impinging on the economy (Lim 2009). One issue of vital concern is the fact that there is at present no regulation in Singapore making Environmental Impact Assessments (EIAs) compulsory for major developmental projects (Hamilton-

Hart 2006). From the government's point of view, it is logical not to legislate EIAs in view of the scarcity of land and resources and also as a result of a government concern that EIAs might hinder the progress of economic development (Newman & Kenworthy 1999). Currently, an EIA is required by the MEWR only in the case of projects that may cause pollution or sufficiently harmful effects on the environment (Heng 2002). Ironically, the extent of harmful effects on the environment cannot be determined without an EIA (Malone-Lee 1993). The government's resistance to the implementation of compulsory EIAs reveals that the shaping of the Garden City is a result of the government's way of defining the measures considered necessary: more in terms of economic advantages rather than environmental ones.

Furthermore, the focus on prioritising cost and economic benefits through an energy efficiency strategy may only cap the limit of going green, when what is really needed is a careful raising of awareness through an internalisation of environmentally friendly practices. Instead of actually educating the public on environmental issues, the energy efficiency approach has been to play on the pragmatic aspects of everyday life. The allure of cutting costs would only be effective when people are under financial constraints; most adopt energy efficiency because to do otherwise would compromise their economic capacity. Thus the approach is less effective when that compromise becomes less apparent (Lim 2009). Therefore, there is a concern that the public will no longer be as supportive of low-carbon development once the Singapore economy is entirely recovered.

Civil society movements in Singapore have been an important driver for a more permanent shift in attitudes of the government and residents towards environmentalism. For example, Nature Society Singapore (NSS) is a non-governmental, non-profit organisation set up by a group of enthusiasts to raise awareness of green issues in Singapore (NSS 2006). NSS has been actively advocating the introduction of legislation requiring EIA implementation on all developments that might affect nature reserves, parks, public open spaces and vulnerable coastal locations (Heng 2002).

The NSS and other green groups in Singapore have long also acknowledged that the support and participation from the public is vital to the success of parks and conservation in Singapore. To achieve this, these civil society groups carry out public education campaigns targeted at all levels of Singaporean society, as well as nature conservation, nature history, and environmental ethics programmes targeted at tertiary students, in a continued attempt to bring about lasting attitude shifts towards a green social paradigm (Tan 2010). And, despite some

differences in views between the government and these groups, there is substantial cooperation between the two towards this goal. In particular, the National Parks Board, the government authority in charge of managing greenery issues in Singapore, works closely with civil society groups to promote public awareness of Singapore's environment. The Board has also provided funding to support the activities of these groups and facilitate more networking among the individual groups for this purpose (IMCSD 2009).

7 Conclusion

This equilibrium between economic and environmental purposes is important. Countries should remain wary of basing their environmental and climate change solutions too firmly on pragmatic and economic foundations (Lim 2009). Green Economy strategies that are too focused on cost efficiency and economic benefits may only offer short term solutions for countries experiencing economic downturns. Furthermore, there is a risk of environmental benefits being used only to encourage economic development, while being ignored when environmental concerns could limit economic growth. Therefore, in the pursuit of economic goals, the environmental purpose, which can be considered as the springboard of the green economy approach, should not be neglected.

As explained above, the Singaporean government has, throughout its history, been careful in trying to balance economic agendas and environmental concerns in its developmental policies. Green Economy efforts in Singapore have consistently echoed Lee Kwan Yew's emphasis on aestheticism, social concerns, and environmental sustainability towards an overall better quality of life, alongside economic and developmental goals. The Singaporean government's focus on the environment can be traced back to Singapore's geo-political limitations as a small island state with limited natural resources, making sustainable development a necessary goal. However, as mentioned above, challenges remain in encouraging a change in attitude of Singaporean residents towards actual environmental concerns independent from economic agendas.

Most notably, in this time of financial recovery, more education is needed among the Singaporean public to bring about a real attitude change towards environmental awareness, to move away from purely cost efficiency perspectives on the environment. Existing joint efforts between the government and civil society give hope for the achievement of a balance between the economic and

environmental needs of Singapore, but there remains room for improvement. Singapore should capitalise on its recently formed alliance with the C40 Cities Climate Leadership Group, as the country can learn from the experiences of other cities, especially in terms of strategies for building public awareness towards the environment.

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Green Economy Perspectives for **SOUTH AFRICA**

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1 Backdrop to the Green Economy in South Africa

Due to its reliance on coal, South Africa ranks among the dirtiest global energy producers, with its national electricity public utility Eskom producing the second most emissions of any utility in the world. The country is the sixteenth highest emitter of carbon dioxide globally (IEA 2014) and is by far the highest emitter in Africa. In 2012, South Africa accounted for 376.1 million tonnes of total carbon dioxide emissions with per capita emissions of 7195 kilogram of carbon dioxide, making it the country with the highest per-capita emissions among the BASIC states (IEA 2014).

In the context of international negotiation processes regarding climate change mitigation and the transition towards a green economy, South Africa has therefore made commitments, as stated in various key speeches by President Jacob Zuma (Zuma 2009). The South African government committed to an emission reduction target of 34 percent by 2020 and 42 percent by 2025 against a business as usual curve (DEA 2011a). In spite of the steps taken at the level of green policy framework development described further in this article, South Africa still provides significant incentives for investment in energy-intensive industries, which are an important source of employment, investment and income for the country. Shifting away from its traditionally energy and carbon intensive development path is South Africa's main challenge in the transition process towards a green economy.

2 The Evolving Policy Framework

In its input to the preparatory processes of the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference), the South African government promoted an accelerated implementation of the global sustainable development agenda outlined at the World Summit on Sustainable Development in Johannesburg in 2002.

At the same time, it recognised the impacts of new global challenges such as food crises, the international economic crisis and related financial system challenges, as well as climate change. A combination of these challenges has increased scarcity of water, biodiversity and ecosystem loss, as well as desertification, heavily impacting developing countries. South Africa has thus supported the global negotiations on a green economy in the context of sustainable development and poverty eradication. It proposed to define the green economy as a "system of economic activities related to the production, distribution and consumption of goods and services that result in improved human well-being over the long term, while not exposing future generations to significant environmental risks or ecological scarcities" (UNCSD 2011). According to the South African government, the overall objective of a green economy should focus on the promotion of "sustainable development by decoupling economic growth rates from environmental degradation while improving the quality of life of all, with particular reference to the poorer groups" (ibid.). The government further stipulated that greening the economy will "ensure that the natural resource base is enhanced by promoting resource efficiency while securing the well-being of humanity" (ibid.).

The necessity to decouple economic growth from environmental degradation is reflected in South Africa's national Long-Term Mitigation Scenarios (LTMS). This scientific analysis, initiated by the Department of Environmental Affairs and officially endorsed by the cabinet in July 2008, presents trends and scenarios regarding South Africa's greenhouse gas (GHG) emissions. The Growth Without Constraints scenario projects economic growth to result in an almost four-fold increase in South Africa's GHG emissions (from 446 million tonnes in 2003 to 1,640 million tonnes by 2050). Consequently, a Required by Science scenario is proposed within the LTMS that would see the growth of carbon emissions peak (up to 2020), plateau (between 2020 and 2030) and decline (from 2035) (Scenario Building Team 2007).

Table 1: Main policies related to green economy in South Africa

2006	Framework for Environmental Fiscal Reform	National Treasury
2008	Innovation Plan	Department of Science and Technology
2009	Medium-Term Strategic Framework 2009–2014	National Planning Commission (NPC, resides in the Presidency)
2010/11–2012/13 and 2012/13–2014/15	Industrial Policy Action Plan	Department of Trade and Industry (DTI)
2010	Green Economy Summit (Statement)	Department of Environmental Affairs (DEA)
2010	New Growth Path (including Green Economy Accord)	Economic Development Department (EDD)
2011	Integrated Resource Plan 2010–2030	Department of Energy (DoE)
2011	National Climate Change Response White Paper	Department of Environmental Affairs (DEA)
2011	National Strategy for Sustainable Development (based on National Framework for Sustainable Development of 2008)	Department of Environmental Affairs (DEA)
2011	National Development Plan	National Planning Commission (NPC, resides in the Presidency)

Overall, South Africa has developed a series of framework policies and action plans with respect to the transition towards a green economy. Many policies originated before the concept even came into widespread use around 2009–2010 (Montmasson-Clair 2012). These policies reflect the complex interconnections between different governmental departments and agencies implicated in this process (Table 1).

The Framework for Environmental Fiscal Reform initiated by the National Treasury in 2006 sets out principles and guidelines for fair and effective environmental taxes (NT 2006). Based on the framework, the government has so far implemented taxes and levies on plastic bags, incandescent light bulbs, ecosystem restoration costs related to water use, liquid fuel, non-renewable electricity and vehicle carbon dioxide emissions performance (Montmasson-Clair 2012). The country's Innovation Plan enacted by the Department of Science and Tech-

nology in 2008 aims to address climate change challenges as well as promoting a "safe, clean, affordable and reliable energy supply". The plan has created support for innovation in electric vehicles, fuel cells and carbon capture and storage (DST 2008). The Medium-Term Strategic Framework 2009–2014 developed by the National Planning Commission links various policy areas such as energy, water, housing, technology and competitiveness to sustainable resource management and the achievement of sustainable livelihoods. It thus forms a fundament for several initiatives, amongst others on renewable energy and water management (NPC 2009). Similarly, the Industrial Policy Action Plan (IPAP) for 2010/11–2012/13 aims at the expansion of the energy-saving industries through the employment of subsidies, subsidised finance, standards, regulations, and public demonstration investments. It thereby stresses the following areas in particular: solar water heating, concentrated solar thermal, industrial energy and water efficiency, wind, biomass, waste management, and energy-efficient vehicles (DTI 2010, WB 2011). These objectives are picked up in the current IPAP 2012/13–2014/15 (DTI 2012).

In May 2010, the Department of Environmental Affairs convened the Green Economy Summit to identify key elements of and start building national consensus on the Green Economy Path. The Summit Statement stressed the need for a substantial transformation of behaviour as well as of industry technologies and structures to sustain the functioning of ecosystems and reduce climate impacts (DEA 2010, SAIIA 2013). In December 2010, the government endorsed the New Growth Path with the objective of generating 400,000 jobs by 2020. Job creation is based on the expansion of "existing public employment schemes to protect the environment", biofuels production and increased deployment of renewable energy (EDD 2010). Within the New Growth Path, the Green Economy Accord provides a unique opportunity to create a considerable amount of jobs through partnerships among government, business representatives, trade unions and the community constituency (SAIIA 2013).

The National Climate Change Response White Paper lays down the strategic priorities against which South Africa is to achieve its climate change response objectives. Firstly, the country aims to manage climate impacts through interventions that build and sustain the country's social, economic and environmental resilience. Secondly, South Africa strives to make a "fair contribution" to the global effort to stabilise GHG emissions by avoiding "dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable man-

ner" (DEA 2011a). It quantifies South Africa's GHG emissions commitments: 34 percent of GHG reduction by 2020 and 42 percent by 2025 against business as usual. With effective mitigation measures the country aims at increased economic growth as well as green job creation (ibid.).

The Integrated Resource Plan (IRP) 2010–2030 for energy sector development is reluctant to take on emission reducing and other green economy related objectives. It strives to install almost 30 gigawatt of new generation capacity by 2030 and to finish the instalment of approximately 10 gigawatt of new coal-fired capacity. Increased deployment of high-efficiency coal fired generation capacity, 10 gigawatt of new nuclear capacity and 20 gigawatt of renewable energy capacity, as well as an increased import of natural gas and improved energy efficiency measures are planned. While addressing current challenges such as rising energy demand and electricity undersupply, the plan also reduces GHG emissions by 275 million tonnes per year from 2025 onward. In addition, it creates new domestic business and employment opportunities. The plan's investment targets for renewable energy are streamlined with the 3,725 megawatt of renewable energy announced in the Green Economy Accord (DoE 2011, WB 2011). The IRP acknowledges that we are functioning in an increasingly carbon-constrained world, but facilitates continued coal generated power by including a focus on Carbon Capture and Storage — as yet an under-researched field. The IRP does however include efficient resource use and management (electricity and water), although it does not deal with some of the structural issues hindering transition to a green economy or a more secure energy environment: Eskom currently has the monopoly on generation, distribution and transmission. Expert analysis and recommendations have long pointed out that transmission should be removed from Eskom's control if South Africa's energy environment is to transition into a more sustainable model (SAIIA 2014).

The National Strategy for Sustainable Development (NSSD) by the Department of Environmental Affairs as well as the National Development Plan (NDP) under the National Planning Commission from 2011 were both developed after prior electricity, industrial policy and economic development plans. The NSSD builds on the National Framework for Sustainable Development (NFSD) approved by the cabinet in 2008. This framework signalled a new wave of thinking combining environmental protection, social equality and economic efficiency (DEA 2008). The NSSD accordingly pursues a just transition towards a resource efficient, low-carbon and pro-employment growth path. While a large variety of indicators and goals referring to social, environmental and economic

issues are presented in the strategy, the latter does not display any budgets, timelines or responsibilities (DEA 2011b). The NDP constitutes a roadmap to efficiently deliver public services up to 2030, while eliminating poverty and reducing inequality. One of the NDP's six interlinked priorities is that of bringing about faster economic growth, higher investment and greater labour absorption. Focusing on energy and carbon, the plan puts forward the following concrete goals: the introduction of carbon budgeting, a carbon tax (current introduction of the tax is planned for 2016) and incentives for energy efficiency, the instalment of five million solar water heaters, as well as the simplification of the regulatory regime for contracting about 20,000 megawatt of renewable energy by 2030 (NPC 2011). Acknowledgement of resource scarcity is evident throughout the plan, but this is seldom accompanied by a green economy related focus on efficient use, reduced consumption and integrated, sustainable management. For example, the plan refers to South Africa as being a water scarce country. However, the proposed solution is to secure the resource through regional cooperation by obtaining it from neighbouring countries that have "abundant supply" (ibid.). The NDP also refers to "effective safe and affordable public transport (by 2030)" as an enabling milestone. Yet although the LTMS highlight transport as one of the key future emitting sectors, the NDP does not target clean transport, prioritising merely safety and affordability (ibid.).

In addition to these framework policies, several sector- and time-specific policies complement the South African framework on green economy. In recent years, the country has implemented concrete policies related to renewable energies, energy efficiency (standards in particular), waste management, biodiversity, solar water heating, water conservation and demand management, and public transport (UNEP 2013). Various provincial and local governments also engage in green economy activities (for instance provincial green economy or green industry strategies in Gauteng, Western Cape and KwaZulu-Natal) (Montmasson-Clair 2012). A successful example is the Renewable Energy Independent Power Producer Procurement Programme, a public procurement programme introduced in 2011. This competitive bidding process establishes an upper tariff level in auctions for each qualifying technology and winning bidders sign power purchase agreements guaranteed for 20 years. The 64 schemes approved by the government since 2011 will potentially add almost 4,000 megawatt to the power mix (SAIIA 2014).

These various strategies, policies and initiatives are an indication for South Africa's evolving strong profile on economic development in a carbon con-

strained world. This is based on an institutionalised social dialogue between and within government, business, labour and civil society. The Decent Work Country Programme as well as the green economy agenda was mediated through the National Economic Development and Labour Council bringing together these different stakeholders (NEDLAC/ILO 2010, Montmasson-Clair 2012).

3 Challenges in the Move Towards a Green Economy in South Africa

South Africa's prominent position in the multilateral climate negotiations as both a developing country with a larger economy (BASIC group) and as a key member of the African Group of Negotiators, along with the important steps taken at the national level described above, have certainly focused the country's evolving policy position on economic development in a carbon constrained world. However, it is evident that alignment is still challenging, not least because of the need to balance many issues: development that improves infrastructure and its access for so many more people, the urgent need for job creation, and the stated need to recognise that this growth is taking place in an increasingly carbon and resource constrained world. Another balancing act is required in marrying national policy development with South Africa's position in the multilateral negotiations in a manner that does not expose the country and weaken its negotiating position.

South Africa's main challenge in the move towards a green economy is greening its energy, which involves addressing the environmental impacts of the types of energy it uses and improving its energy efficiency. Most of South Africa's current emissions come from the energy sector, with electricity generation currently accounting for 45 percent of energy related GHG emissions (Energy Research Centre 2007). The dependence on coal-based electricity generation is overwhelming, regardless of emission reduction targets. Recent, much needed investments in new generation capacity are also coal-based: the commissioned Medupi plant will have a capacity of 4,764 megawatt and the even larger plant of Kusile, at 4,800 megawatt, is set to be the largest coal-fired plant in the world. The Long-Term Mitigation Scenarios (LTMS) further find that a large portion of the increase in GHG emissions will keep coming from the energy sector, growing on the back of increased demand, particularly from the industry and transport sectors (Scenario Building Team 2007). This high reliance on coal

reserves is the result of past energy and industrial development policies and can be explained by the availability and low cost of this source of energy. Greening South Africa's energy therefore requires deviating from the growth strategies traditionally promoted that are based on comparative advantage considerations.

A transition towards green economy in South Africa undeniably has trade-offs in terms of the effort to realise the country's national socio-economic priorities, although it is likely to provide business opportunities. Measures such as the rise in electricity tariffs over the last years caused considerable resistance by labour unions and business organisations, as did the introduction of a carbon tax to reduce energy demand (Resnick et al. 2012). A steep rise in the average electricity tariff since 2008 was approved by the National Energy Regulator of South Africa in order to fund new capacity in power generation and distribution (SARI 2010). Despite all concerns regarding the impact of increasing electricity costs on the economy, incremental costs of renewables could be reduced. Estimates suggest, for example, that the cost of solar power could fall below coal-fired electricity (SAIIA 2014). In this context, some South African mining companies have started considering using renewable energies in order to lower their fuel expenditure, especially in remote regions with little or no access to established electricity grids (ibid.).

No miracle can be expected from green policies with respect to jobs, as the job gains in energy efficiency and renewable energies would to a certain extent be offset by job losses in the energy and mining sector (Greenpeace International et al. 2012). The problem is that the high unemployment rate demands an intensification of industrial development, which continues to rely on coal as a main source of energy, in the absence of alternatives (SAIIA 2013). Regarding implications of a transition towards a green economy for South Africa's position in international trade, an increase of short-term production costs because of higher electricity prices may have an impact on overall competitiveness of local products in international markets. Currently, trade barriers provide particularly strong protection for sectors that destroy natural capital, in particular energy-intensive sectors such as iron, steel, aluminium and chemicals (SAIIA 2013, WB 2011). Addressing these challenges by providing incentives to increase energy efficiency, by changing the fuel mix through a reduction in the share of coal in the total energy supply, as well as by introducing more non-carbon energy supplies into the South African energy mix could help achieve significant reductions in GHG emissions.

From an institutional point of view, the South African negotiating team in multilateral processes (combining the Department of Environmental Affairs and the Department of International Relations and Cooperation) promotes a strategy of growth in a carbon (and resource) constrained economy. Domestication of this approach is however unclear, with a lack of central, internal leadership on exactly how the country is to implement this strategy outlined so well in the multilateral processes. Whilst all the policy instruments and plans make consistent mention of resource constraints, few make managing these a strategic priority, and related actions are often buried deeply within the plans, or compromised by 'doing both'. The IRP example of continuing to generate electricity from coal through enabling Carbon Capture and Storage is indicative. Also indicative is the NDP's statement: "Research suggests that it is possible to both reduce greenhouse gas emissions from electricity production and still grow the minerals and mineral processing sectors" (NPC 2011).

Alarmingly silent is the private sector. Although a heavy, often inequitable consumer of resources that frequently underpays for water and energy in South African pricing models, the private sector is under-engaged in the drive towards a green economy. This ranges from those that supply public transport to the large-scale mining industry players. Scant regard is given to water use and contamination by this sector and there is no national policy framework attempting to curb energy emissions. In the main, private sector investment is either because of international reputational risk, particularly so for multinationals, or because of recognition of the need for a licence to operate within the communities that operational stability relies on. A coherent policy framework that incentivises private sector involvement in a green economy will help, as will coherent and appropriate private sector investments that recognise the significance of the natural resources that industry is so dependent on.

4 Outlook

It is likely that the kind of clear, central leadership needed for a successful transition towards a green economy is going to be difficult to define in South Africa for some time to come. The socio-economic climate is complex, and two decades into democracy highlight the harsh realities of a government still struggling to redress a socio-political system that has left pervasive damage and challenges. Social conflict in South Africa is deeply rooted and the country is the third dead-

liest on the continent (CCAPS 2012). Declining economic growth rates, with the growth rate of South Africa's gross domestic product decreasing from around 5.5 percent for the period of 2005–2007 to 1.9 percent in 2013 (WB 2015), as well as high unemployment add to this difficult context. An overarching issue remains that of inequality, addressed in the NDP and evident in the current mining industry conflict. This is a particularly challenging context to lead South Africa through with a green economy paradigm.

South Africa has taken some relevant and bold steps towards a green economy — against a complicated backdrop and under unenviable circumstances. Of course, attaining the desired paradigm shifts necessitates the type of central leadership that shows insight into the numerous social, economic, environmental and political contexts and impacts. It also means that a green economy approach has to emerge amongst the top of South Africa's numerous priorities, many of which are in a 'development backlog'. This would effectively position a green economy as integral to the South African vision — something that now it is most certainly not, as can be seen in the NDP. However as the only country in Africa that is a member of the G20, and as a member of BRICS, South Africa is in a position to influence the transition to a green economy and to lobby for investment in green industries in Africa (SAIIA 2013). South Africa can share lessons learned in the current process, both as an investor and policy developer in order to support other countries in negotiating favourable agreements with developed countries (ibid.). Partnerships across government, expert groups, other countries, communities, the private sector and bilateral partners are the only means of success and South Africa recognises their significance. The NDP states as part of South Africa's 2030 vision: "*We say to one another: I cannot be without you, without you this South African community is an incomplete community, without one single person, without one single group, without the region or the continent, we are not the best that we can be.*" (NPC 2011)

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ETHIOPIA – Green Economy in Policy-Making Processes

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1 Introduction

Ethiopia finds itself at a momentous economic and social development crossroads. Over the past decade, the country has achieved high economic growth, averaging 10.7 percent per year, compared to the regional average of 5.4 percent (World Bank 2013). Output-per-capita growth of 8.3 percent between 2003 and 2012 reflects the strength of the underlying economic performance. The source of growth in Ethiopia was attributed to a mix of factors, including agricultural modernisation, development of new export sectors, strong commodity demands, and government-led public investment programmes. Economic growth has brought with it positive trends in reducing poverty headcount, from 38.7 percent in 2004/2005 to 29.6 percent in 2010/2011, and achieving significant progress in several of the Millennium Development Goals (MDGs). According to the 2013 MDGs report (UN 2013), Ethiopia is on track to meet a number of the MDGs, especially in eradicating extreme poverty, achieving universal primary education, promoting gender equality and empowering women, and improving maternal health. The country is also making significant progress in the remaining MDGs.

Whilst these are laudable achievements, the conundrum Ethiopia faces is how to move beyond the MDGs and create conditions for sustainable structural transformation for delivering accelerated growth, without damaging further ecological systems on which growth itself depends. To this end, Ethiopia has now entered a new terrain in development practice with its Growth and Transformation Plan (GTP) running alongside the Climate Resilient Green Economy

(CRGE) strategy. These twin strategies are as ambitious as they are audacious; Ethiopia is proposing to do what may be regarded as counterintuitive to development experience, which is to rapidly grow the economy without externalising the negative costs of development. If anything, the policy-makers are proposing to enhance the quality of ecological services in the course of pursuing growth and massive poverty reduction efforts.

This paper provides a brief political economy analysis of the Ethiopian environmental and low-carbon policies in the face of rapid population growth and poverty. The paper will interrogate three inter-related questions: 1) What is the country-specific background related to a green economy? 2) What are the origins of the green economy debate in the country? 3) Who is driving the green economy debate? The paper will conclude with some remarks on the relevance of the United Nations Conference on Sustainable Development (Rio+20) for Ethiopia and what the country may contribute to the continuing debate. Prior to addressing these questions, the paper will provide a brief background about Ethiopia itself.

2 Genesis of the Green Economy Debate in Ethiopia

Many of the ideas around the green economy are not new in the Ethiopian development discourse. There has been a longstanding recognition among policy-makers in the country and scholars working on Ethiopia that unless the country is able to modernise its agriculture, develop its infrastructure and create viable industries, it will continue to struggle to meet the basic needs of its population.

While there has been little dispute on the desirability of these goals, agreement over the pathways and strategies that will lead to sustained growth has been elusive. Indeed, the yearning for social change to address the scourge of poverty and degradation remain etched in the popular imagination and have considerable influence on the thinking of the current leadership in mobilising the innovative spirit of individuals and institutions across the country. What is also evident is that change in a country such as Ethiopia does not come easily. An emerging concern is the apparent contradiction between the critical nature and sheer magnitude of poverty levels demanding quick solutions, and the complex steps towards structural transformation, requiring careful planning, institution building and policy experimentation that take time.

Much like elsewhere in Africa, the nature of development in Ethiopia is a contested terrain between different worldviews, and riddled with many false starts — though well-meaning they may all be. In order to appreciate the genesis of the discussions around the green economy, it is therefore important to understand that Ethiopia has undergone numerous policy trials with mixed outcomes. Though beyond the scope of this paper, it is clear that the food security and soil degradation narratives in Ethiopia have persisted for several decades in framing the environmental degradation (and rehabilitation) agenda (Keeley & Scoones 2000). Often, these debates are reinforced by the major food security crises of the 1970s, mid 1980s and early 1990s, which serve as testaments of just what happens when human and natural systems collide to generate major tragedies with political consequences. With growing international debate surrounding the environment through the various platforms such as the United Nations Conference on Environment and Development in 1992 (Rio conference), and follow-up initiatives such as the Convention to Combat Desertification and the United Nations Framework Convention on Climate Change, the issue of boosting food production and achieving food self-sufficiency has received further traction in national policy processes. This has also brought international and national actors into the policy space, more than ever before, where the Ethiopian experiment with the green economy strategy and its practical implementation provide the empirical basis to make advances on the concept — and a harbinger for what is to come elsewhere in Africa.

Taking a closer look at the implementation of the green economy in Ethiopia today, the current vision is somewhat different from previous environmental rehabilitation and conservation efforts. The current vision follows policies that are more pre-emptive rather than reflexive to crises, growth-oriented as opposed to crisis management, results-focused rather than ideologically entrenched, and with economy-wide remit rather than sector-specific (agriculture) interventions. In short, the vision is ambitious in its scope and bold in its expectations, and is explored further through the vista of the current development plan (GTP) and the green economy strategy.

3 The Evolving Nature of the Green Economy in Ethiopia: One Road and Two Pathways

Even though Ethiopia has seen major improvements in economic and social development indicators, it remains one of the poorest countries in the world with high population growth and declining ecological services on which livelihoods depend. Population continues to expand at a rate of about three percent, and projections indicate that it will increase from 94 million in 2013 to above 116 million in 2025 (UNFPA 2013). Furthermore, according to the 2013 Human Development Report, about 39 percent of the Ethiopian population lives below the income poverty line (the official poverty line is 1.25 US dollar in 2011 purchasing power parity). Although on a declining trend, youth unemployment (between the ages of 15 and 24) remains high at 29 percent in 2011 (UNDP 2013). Finally, many parts of the country are impacted by high variability of rainfall patterns, drought, and soil degradation with climate change having a multiplier effect on these impacts.

Ethiopia's daunting socio-economic reality has inspired the arrival of two ambitious national programmes: the GTP and the CRGE strategy, launched in 2010 and 2011, respectively (MoFED 2010, FDRE 2011). The appearance of these two strategies around the same time is not an accident. They both emerged from the Prime Minister's office and embody the thinking of Meles Zenawi, who served as Ethiopia's Prime Minister from 1995 until his death in 2012. In a speech he gave at the Sixth African Economic Conference, he argued:

"I can think of three good reasons why green growth is and cannot but be an essential element of Africa's structural economic transformation and none of them have much to do with what we as Africans can or should do to mitigate global warming. We cannot even think of structural economic transformation in Africa without transforming our agriculture and stop or at least radically mitigate soil erosion. We can and should embark on green development as part of our structural economic transformation because we are richly endowed with green and renewable sources of energy. Structural economic transformation in Africa will require that we catch up technologically with the most advanced nations. If the future is in green technologies our strategy for catch up cannot be based on technologies that will be out of use by the time we catch up."

From the above statement, it is possible to deduce that structural economic transformation and green economic development should go hand-in-hand

given the need to reduce vulnerability, capitalise on resources endowments, and benefit from on-going technological advances. Between 2000 and 2011, the country implemented a series of policies and strategies[1] that were guided by Ethiopia's long-term strategy of agricultural development-led industrialisation, formulated in the early 1990s. These policies and strategies paved the way for the emergence of the current GTP, which lays out a medium-term plan (2010–2015) that would take the country towards a middle-income status by 2025 by boosting agricultural productivity, strengthening the industrial base, and fostering export growth. According to the GTP, gross domestic product (GDP) per capita would grow from its current level of around 380 US dollar to over 1200 US dollar within a timeframe of 15 years, which effectively means maintaining an annual GDP growth rate of more than ten percent and significant growth in domestic savings rates (MoFED 2010). In terms of the structure of the economy, the GTP envisages that agricultural development will continue to be a central plank of the growth plan, expected to grow at an annual rate of 8.6 percent per annum, although its share will diminish from 42 percent to 29 percent of GDP by 2025. More importantly, the industrial sector will grow at a rate of 20 percent per annum, and its share of GDP will rise from 13 percent to 32 percent by 2025. The service sector will also see its share of GDP reach 39 percent by 2025.

Growing the economy is seen as one side of the development story in Ethiopia. The country's CRGE strategy, launched at the United Nations Climate Change Conference in Durban in December 2011, is intended to embed climate responsible philosophy and practices in operationalising the GTP. The motivation behind the CRGE, the country's leadership argues, is rooted in the need to prevent a further decline of ecological services that livelihoods depend on and to harness the country's considerable natural resources. Hence, the challenge brought about by climate change is not only seen as a barrier to development but also as an opportunity for transforming the economy. As such, the green path to development is seen as a prerequisite for survival and an important way towards adjusting to new development circumstances, regardless of the outcome in the climate negotiations.

The CRGE strategy explains that the country's current emissions are still low at 150 million tonnes of carbon dioxide equivalents in 2010, with more than

1 These included Sustainable Development and Poverty Reduction Programme (2000–2005), New Coalition for Food Security (2003), Agricultural Growth and Rural Development Strategy and Programme (2004), Food Security Programme (2004), Productive Safety Net Programme (PSNP 2004), and Plan for Accelerated and Sustained Development to End Poverty (2006–2010).

85 percent of greenhouse gas emissions coming from the agricultural and forestry sectors, followed by power, transport, industry and buildings, each contributing three percent to overall greenhouse gas emissions. Another interesting finding of the CRGE strategy is that the power sector only accounts for a small proportion (5 million tonnes of carbon dioxide equivalents) of the current greenhouse gas emissions, mainly because more than 90 percent of total power generation capacity comes from hydrogenation plants. Here, ample opportunity exists to expand hydro generation and renewable off-grid power generation with low-carbon content to energise future industrial development and transport systems.

Under a business-as-usual scenario, emissions would more than double from 150 million tonnes of carbon dioxide equivalents in 2010 to 400 million tonnes of carbon dioxide equivalents in 2030, given the ambitious plans under the GTP (FDRE 2011). The highest increase will come from agriculture — adding around 110 million tonnes of carbon dioxide equivalents in greenhouse gas emissions, followed by industry at 65 million tonnes of carbon dioxide equivalents and forestry at 35 million tonnes of carbon dioxide equivalents. Under the growth plan, industrial and transport activities are expected to receive a significant boost, translating to significant increases in greenhouse gas emissions at 15 percent and eleven percent per annum for industry and transport emissions, respectively. By 2030, industry emissions, under BAU assumptions, are therefore projected to increase by more than 1200 percent, while transport emissions are estimated to increase by 700 percent. This picture is typical of a country in the early stages of development whereby capital accumulation is geared towards addressing economic growth and social development concerns, often at the expense of environmental and ecological quality (Constantini & Monni 2008).

A unique feature of the CRGE strategy is that it provides the roadmap on how the GTP can follow a net-zero greenhouse gas growth, limiting it to 145 million tonnes of carbon dioxide equivalents in 2030, while at the same time building the resilience of the economy to climate shocks (FDRE 2011). This is intended to inject a sense of responsibility into the GTP by leapfrogging carbon-intensive pathways for the 2025 horizon, while at the same time reaping significant sustainability co-benefits for Ethiopia. Some of the broader plans in the CRGE strategy would entail: 1) adoption of agricultural and land-use efficiency measures; 2) increased greenhouse gas sequestration in forestry, that is protecting and re-establishing forests for their economic and ecosystem services; 3) deployment of renewable and clean power generation; 4) use of appropriate advanced

technologies in industry, transport and buildings. The 60 or so priority initiatives embedded within the CRGE strategy would deliver "avoided greenhouse gas emissions" of some 250 million tonnes of carbon dioxide equivalents in 2030, compared to pursuing a conventional development path.

Implementation of the CRGE strategy will face many challenges, requiring strong and coordinated political push and the appropriate scale of institution building. The full roll-out of the CRGE initiative is coordinated and overseen by the Prime Minister's Office, the Federal Environmental Protection Authority[2] and the Ministry of Finance and Economic Development jointly, through a two-year integrated planning process called the iPlan (MoFED 2012). Given the sectoral focus of the CRGE, the iPlan process will involve translating the priority sectors and initiatives identified into sectoral programmes and investment plans by line ministries and regions where CRGE units will be established. Wereda (district) level proposals will be collected under the regional investment plans with a view to supporting the national agenda of building a climate responsive economy that is grounded in bottom-up and systematic aggregation of local needs and priorities.

Already some major initiatives are underway that will contribute to the low-emissions development pathway. Some of these include large-scale hydropower, wind farms and geothermal projects that are expected to increase generation capacity from the current level of about 2000 megawatt to over 10,000 megawatt by 2015, and 22,000 megawatt by 2030, also amounting to 50 million tonnes of carbon dioxide equivalents (by 2030) in emissions avoidance (MoWE 2012). The transport sector has also been given a major boost as part of efforts to integrate the energy, transport and communications sectors. Construction has commenced on a country-wide railway system, which will ultimately cover some 5,000 kilometres, as well as a 34-kilometre light rail system in Addis Ababa to ease congestion and displace polluting trucks and other vehicles. Furthermore, these systems will be run on low-carbon electricity (over 90 percent hydro-generated), which is expected to meet the demand for enhanced transport systems and reduce the carbon intensity of bulk transport in line with the GTP and the green economy strategy, respectively. Other smaller-scale programmes in forestry and land use are also underway, which in aggregate will contribute to the realisation of the twin objectives of climate and development outcomes.

2 Now the Ministry of Environment and Forest.

4 Ethiopia: an Aspiring Developmental State?

Sustainable development goals (SDGs) and principles, definitions and implications for different country categories around the green economy generated considerable discussion and debate at Rio+20. Highlighted in these discussions are the considerable challenges that policy-makers in a country such as Ethiopia are likely to face. Not least of these challenges is the question of how low-emission strategies can interact with other policy priorities. Events such as Rio+20 provide a vital source of knowledge and important platforms for interaction, learning and fostering collaborations.

In the Rio+20 summit's main document entitled *The Future We Want*, it was affirmed that employment creation, poverty eradication and technology transfer are central to achieving development outcomes. The peculiarity of recent Ethiopian development experience lies in the fact that, unlike many countries in the region, economic growth is not driven by natural resources extraction, but results from public capital investments in dams, roads and power plants (Fantini 2013). Furthermore, over 60 percent of public investments and expenditure is concentrated on poverty-oriented sectors and basic services delivery (Dom 2010) — deliberately aimed at addressing citizens' welfare and national self-reliance.

In its essence, the GTP has the hallmarks of a social and economic plan for an aspiring 'developmental state' where shifts in the structure of the economy towards high-productivity sectors are seen as fundamental for employment and raising the standard of living, and where investment in infrastructure development is perceived as a critical element to sustain these sectors. Indeed, the return of the 'developmental state' in the transformation of the Ethiopian economy has much to do with the revived conviction and empirical evidence of the pivotal role the State plays in accelerating growth and transformation (Zenawi 2011). The Korean and, to some extent, Chinese growth models have provided inspiration for the re-emergence of this thinking.

The question is whether the pursuit of development along an active and interventionist state has its limitations in delivering on the promise of the green economy. It is too early to answer this, since the green economy strategy as a policy direction is new in Ethiopia (and elsewhere for that matter). It is therefore difficult to evaluate the extent to which it will shape the nature of the country's development pathway — and for how long. What is interesting however is the manner

in which the Ethiopian bureaucracy has embraced this concept lock, stock and barrel, domesticated it and created policies and implementation mechanisms almost entirely in its own image. Of course, there are wider international actors and networks that are feeding into the conceptualisation and implementation of the green economy programme. Yet these actors are attracted by the leadership's willingness to engage and its seriousness to implement green economy-type projects, even if the primary motivation may be rooted in addressing development and poverty reduction needs.

5 Conclusion

Ethiopia is pursuing an interesting development path. It is successfully creating the 'hardware' (infrastructure), which will play a critical role and serve as a foundation in the country's quest for structural transformation. The thinking here is that investment in the economy will be attracted by the presence of reliable infrastructure. However, beyond creating the 'hardware', Ethiopia would need to develop the 'software' that can help sustain inclusive growth. This includes building viable institutions, diversifying sources of finance including from domestic sources, and developing policies that would energise the domestic private sector to shift its culture from "rent seeking tendencies" and engage in value-added enterprises. While the country is engaged in this important journey of development, strengthening its National System of Innovation through investment in science, technology and innovation will be critical. Guaranteeing continued success will require a combination of on-the-job training, enhancing the quality of tertiary education and its research capability, and creating a vibrant platform where policy-makers, researchers and practitioners can co-generate and organise knowledge.

The chances are that some of the green economy interventions may not lead to successful outcomes for a variety of reasons. This should not be a surprise given that the green economy is a new concept with no real operationalising blueprint. It means that the green economy 'implementers' will need to accept that there will be a great deal of 'learning by doing' — plenty of social learning and experimentation. The critical issue is not to dwell on 'unimportant' successes that offer little practical or policy lessons, but rather how to learn from important failures and how well to internalise these to further refine future interventions. The CRGE initiative would therefore need to put in place robust evaluation pro-

grammes that would enhance the utilisation of lessons learnt, with a particular emphasis on mainstreaming this new knowledge for the service of policy adjustments and revisiting approaches.

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SUB-SAHARAN AFRICA – Potentials and Barriers for Green(er) Economies

by **Johanna Klein** *(CAD) and* **Stefanie Reiher** *(GIZ)*[1]

1 Introduction

The following article is based on a study *Green Economy in Sub-Saharan Africa – Lessons from Benin, Ethiopia, Ghana, Namibia and Nigeria,* which was commissioned by the 'Deutsche Gesellschaft für Internationale Zusammenarbeit' (GIZ) sector network for Sustainable Economic Development in Sub-Saharan Africa. The study based its understanding of Green Economy on the definition as given by United Nations Environment Programme (UNEP 2011). It analyses potentials for green economic development in Africa on the basis of five country case-studies, which were conducted in 2011 (GIZ 2012).

Whether the 'Green Economy' is a relevant concept in Sub-Saharan Africa is disputed (see for example Resnick et al. 2012). It is argued that the social and economic challenges in the region make it an unrealistic new concept that comes at the expense of development and growth. The focus on drivers and challenges for green economic development provides counter-arguments to such a stance. This article argues that Africa's highly resource-abundant economies will need to become more environmentally and socially sustainable to experience sustained and inclusive growth in the medium to long term. Moreover, sensibly implemented Green Economy reforms bear potential to prevent hazards that harm vulnerable groups the worst, to offer economic opportunities to the poor, and to avoid lock-in effects that hamper future development.

The article does not aim to provide a comprehensive picture of the potential for establishing a Green Economy in Africa, but rather tries to help understand

1 This article reflects the author's personal opinion.

the concept in an African context, based on the experiences made in five different countries (Benin, Ethiopia, Ghana, Namibia and Nigeria). The major focus of the analysis lies on the economic opportunities arising and the challenges that prevent their realisation.

2 Green Economy in Africa: a Relevant Concept?

Most current debates on how to foster Green Economies have not been focused on the specific requirements, challenges and opportunities the concept may have in an African context. Compared to other regions, African economies rely heavily on natural resources, have large informal sectors, major infrastructure gaps, and often generally lack structural transformation. High poverty rates and low human capacities are characteristics that need to be taken into account for a "green" transformation. Is 'Green Economy' nevertheless a relevant concept, and worthwhile supporting?

In the run-up to the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference), the African Development Bank (AfDB) developed an approach to "Green Growth in Africa", which takes the debate away from a global focus and emphasises specifics of the African context. "In Africa, green growth will mean pursuing inclusive economic growth through policies, programmes and projects that invest in sustainable infrastructure, better manage natural resources, build resilience to natural disasters, and enhance food security." (African Development Bank 2012) From the AfDB's perspective, Green Growth — which in this article will be used as a synonym for Green Economy — offers opportunities to meet Africa's development needs today and ensure sustainable growth in the future, especially with regards to infrastructure deficits, efficient management of natural resources, natural disasters, climate change and food security. The new ten-year strategy of the AfDB therefore focuses on the quality of Africa's growth, emphasising that it needs to be inclusive and gradually become 'green'.

While the adoption of coherent strategies that could foster more sustainable and inclusive growth is still in its infancy in the five countries analysed, African governments seem to increasingly recognise the potentials Green Economy bears for development and reaching economic and social objectives. There are a number of interesting initiatives that have been developed throughout the last few years. One example is Ethiopia, which has developed a Climate Resil-

ient Green Economy Strategy based on its Growth and Transformation Plan (2011–2015). This outlines the steps required to transform Ethiopia's economy into one that is carbon neutral and climate resilient, and also describes roles and responsibilities of governmental and non-governmental stakeholders.

However — and despite the promising steps the AfDB, some governments and other actors have been taking — a lot remains to be done to develop a clear concept of Green Economy in the regional context. In particular, potential trade-offs between different aspects of sustainability will need to be analysed thoroughly and managed very carefully by policy-makers. One risk African governments highlighted in the run-up to the Rio+20 conference was the creation of new trade barriers through greener growth strategies in industrialised countries. Additionally, avoiding certain economic activities that are regarded as too environmentally harmful (e.g. extensive use of pesticides or increased air pollution) can reduce growth rates, at least in the short term, while policy instruments like environmental regulation, 'greening' of (energy) infrastructure or reductions of environmentally harmful subsidies might hit vulnerable groups hardest. Poverty, underemployment, and low human development remain major concerns, and Green Economy strategies need to be carefully designed to take these aspects into account. Strategies should base green economic development on the three pillars of social, economic and environmental development. Therefore, the focus in the following will be on how to make best use of the economic opportunities a Green Economy presents, based on what is already happening on the continent.

3 Major Drivers for Green Economy in Sub-Saharan Africa

As part of our research, a number of economic drivers have been identified that can help to capitalise on the nature of African economies, to overcome important development challenges, as well as to reduce external risks posed to African economies through environmental degradation and climate change.

3.1 Pressure to Adapt to a Changing Climate and Environmental Degradation

Based on information from the Intergovernmental Panel on Climate Change, Sub-Saharan Africa is one of the regions most affected by climate change (IPCC 2007). Changes in rainfall patterns and increasing climate-related disasters will signif-

icantly intensify the vulnerability of African economies, especially as they are highly dependent on natural resources. Based on the country studies undertaken during the course of the research, it is apparent that there is a general increase in the frequency of droughts and floods, as well as other natural disasters. Moreover, water scarcity is an increasing problem and will gain even more relevance in the years to come. Increasing deforestation, desertification and land degradation are among the major causes of declining agricultural productivity, on which large parts of the (poor) population depend. This process is accelerated by population growth, livestock pressure, a current lack of incentives for more sustainable land management, and little awareness of the effect of unsustainable farming practices and land degradation. Adapting to these challenges by creating and implementing policies in favour of Green Economy will be a major necessity to sustain the current economic growth and secure business models in African economies.

3.2 Use of Natural Resource Abundance as a Driver of Green Economy

As the comparatively high economic growth rates in African economies are almost exclusively based on natural resources,[2] including fertile land, enormous renewable (energy) resources, biodiversity etc., conservation and sustainable use of these resources is one of the major drivers for a Green Economy in Africa.[3] To sustain the existing economic potential, they have to be managed carefully, avoiding increasing environmental degradation, which would lead to further depletion and jeopardise future economic potential. Conserving and enhancing the natural capital of the continent will be an important source of income, livelihood and jobs for the majority of Africans, and represents an important driver for a transition towards a Green Economy.

3.2.1 Agriculture

Agriculture is one of the most important sectors in all of the countries, especially when it comes to employment. A predominant share of the population — between 60 percent in Nigeria and up to 85 percent in Ethiopia — depends to a great extent

2 Natural resources are subdivided into four categories: mineral and energy resources, soil resources, water resources and biological resources (UN DESIPA 1997).

3 Although the study did not find the extractive resources industry as a major driver for green growth, it should clearly be acknowledged that 'greening' this sector will be inevitable to set African economies on an environmentally more sustainable growth path.

on agriculture as a source of livelihood. While agriculture is an extremely important sector, it is generally characterised by low productivity, the dominance of small-scale producers cultivating small landholdings, low technology use, and the reliance on human labour. The only exception would be Namibia, which additionally has a strong focus on commercial livestock, accounting for 60 percent of its exports. At the same time, agriculture is extremely vulnerable to environmental risks and the implications of climate change, which in turn provides a strong argument for the integration of Green Economy aspects into development strategies. This reasoning is further supported by the necessity to increase sustainability and productivity in order to improve the livelihood of a large share of the population. As the former Ethiopian President Zenawi put it, "we cannot even think of structural economic transformation in Africa without transforming our agriculture" (Zenawi 2011).

Common initiatives underway in some of the five countries include organic agriculture and biotrade. While organic agriculture is still a niche market with a very small production volume in all five countries, it is expected that the market share will grow significantly in the next few years, exhibiting an important potential for export — especially for processed organic products. Organic Agriculture Associations are active in all five countries, providing support to farmers and promoting the development of new production and certification processes that will open new markets. Much could also be done to provide access to infrastructure and develop adequate distribution systems, which remain the two main challenges for farmers who switch to organic methods. It also appears fundamental to promote marketing initiatives so that more significant markets are created.

3.2.2 Biotrade

In the area of biotrade,[4] a potential for the development of indigenous crops, which can be used for medical and industrial applications, biofuels (jatropha, prosopis, oil palm) or food supply has been identified as one of the most interesting activities for an African Green Economy. Africa's rich biodiversity, and the accumulated knowledge of it, result in interesting products for commercialisation and export. This relates to livestock breeds, wildlife, indigenous crops and vegetables, timber and non-timber forest products, indigenous fisheries and

4 Trade in biodiversity based businesses or biotrade refers to those activities of collection, production, transformation, and commercialisation of goods and services derived from native biodiversity under the criteria of environmental, social and economic sustainability.

marine resources as well as indigenous natural products. In Namibia, biotrade has demonstrated its potential. Its gross domestic product (GDP) share is around 4.5 percent and it is estimated that it could reach up to seven percent of GDP in the future (UNEP 2012). If biotrade is to succeed, it is essential to ensure that ecosystems are used sustainably so that exploitation can take place in the long run, which will represent another opportunity for preserving national natural resources. As a matter of fact, a study conducted in Nigeria, where more than 45 medicinal plants are harvested for trade on a regular basis in the rainforest, demonstrates that biotrade can become an opportunity to rehabilitate the natural forests (Nwajiuba 2011). In Nigeria, rehabilitation has been facilitated through conservation initiatives, ensuring respect for the existing environmental protection laws and attracting funding and technical support from interested stakeholders such as pharmaceutical industries, non-governmental organisations, states and local governments. As such, biotrade provides significant potential, but it needs to be explicitly considered within international negotiations and requires attracting further interest in the private sector in order to fully capitalise on the existing opportunities. Innovation of indigenous products, building capacity for the supply chain, as well as building markets are also fundamental. This also applies in the area of deforestation, where Community Based Forest Management is becoming increasingly popular for ensuring sound management of natural resources while providing income and employment for the poorest parts of the population.

3.2.3 Tourism

Another sector where conservation can be linked to poverty alleviation and rural development is the growing tourism sector, as a key industry depending on an intact environment. Strengthening green and sustainable tourism could be an important driver in various fields such as natural resource management, energy and water. Countries like Ghana, Namibia, Benin, and to a lesser extent Nigeria, have developed several projects of sustainable, community-based ecotourism aiming to create mutually beneficial relationships between conservationists, tourists and local communities. Also, initiatives promoting ecotourism labels have been supported, such as a local Eco award in Namibia, which focuses on promoting the creation of eco-friendly accommodation establishments.

3.3 Need for Access to Modern Energy

Access to energy is one of the major challenges in all five of the countries analysed, hampering economic and social development. The percentage of the population without access to electricity and modern energy varies between 85 percent in Ethiopia and 45 percent in Ghana. The countries analysed represent a mix of countries possessing fossil fuels (Nigeria and Ghana) and countries heavily depending on energy imports. In all countries the need for access to modern energy has been identified as an interesting driver for Green Economy, based on the fact that 1) a large share of the population in Sub-Saharan Africa is still without access to modern energy, and 2) an economic transformation and the economic growth necessary to lift countries out of poverty will require important energy resources and electricity generation.

The African continent has enormous untapped potential sources of renewable energy, including solar energy, biomass and wind energy that lead to few opportunity costs and entail potential for job creation, economic development and long-term energy security.

At the same time, the high cost of connecting remote areas and communities to the grid makes the development of decentralised sustainable energy solutions, as well as the use of renewable energies, an important driver on the path towards Green Economy. In this area, in contrast to industrialised countries with their inflexible grids that prevent a radical change in the structure of energy supply, African countries have the opportunity to leapfrog to modern energy technologies that have been developed over the course of the last years and prevent expensive infrastructural lock-ins when making good decisions today.

It is commonly acknowledged that access to modern energy increases the quality of life in rural communities. Examples show that business models which bring access to renewable energies to remote areas do not only enhance access for the poor but can also create new employment opportunities at the Base of the Income Pyramid (BoP approaches).

In all countries a series of programmes promoting renewable energies (especially in the area of solar and biomass) have been developed, since those measures are especially suitable for providing off-grid energy solutions to remote communities. Nevertheless, these programmes are still underdeveloped and much could be done to promote their potential for Green Economy. Some examples for existing programmes include Namibia, where the Ministry of Mines and Energy is promoting renewable energies, especially solar energy, through solar

shops or a Solar Revolving Fund that subsidises solar home systems in remote areas (MME, undated). Another example is Benin, which provides credits on solar photovoltaic systems for remote areas without access to energy.

4 Major Barriers for a Green Economy

There are a number of barriers for the implementation of a Green Economy. One important aspect is related to the inter-institutional character of Green Economy. A number of different actors with various responsibilities need to be coordinated and should be integral to reforms to create the necessary framework conditions. Currently, Green Economy is predominantly handled as an environmental topic, taken care of by (weak) ministries of environment. The ministries of finance, as well as trade and industry are hardly involved and there is very little awareness of the role they could play in promoting Green Economy. The lacking cooperation leads to the concept being used as an argument to justify environmental initiatives, rather than being considered as a strong engine and opportunity to propel economic development. Even in those countries that have developed an inter-ministerial steering committee, such as Ethiopia, there is a lack of capacity to create and exploit synergies between the various institutions. In interviews, it has been mentioned that the uncoordinated efforts of various institutions led to fragmented initiatives failing to create the impact that they could have generated. Coordinated, strategic and systemic support would be necessary to enable these organisations to increase their impact.

Equally as challenging, and part of the explanation for the lack of coordination, is the existing human and institutional capacity in the countries analysed. In general terms, policies (relating to climate change, environment and sustainable development) that have been developed were perceived by interviewees as relatively exhaustive and complete. However, when it comes to translating these policies into action, implementation and enforcement are a major challenge in the Sub-Saharan context. The lead actors (generally ministries of environment) are often overwhelmed by the complexity of the task, as they tend to be rather weak and have a large number of responsibilities with limited budget and human capacity to mainstream Green Economy approaches on a broad scale. This goes hand in hand with a general low awareness of the potentials a Green Economy bears, especially in those ministries that are not directly involved with the implementation of environmental topics.

The development of Green Economy policies and frameworks is further hindered by the fact that data on environmental statistics and the impacts of economic policy on environmental degradation is generally insufficient. Data that would justify certain investments, as they quantify the reduction in environmental degradation and the subsequent positive impacts on productivity and reduction in natural resource depletion, are often not available. The few research organisations that are dealing with Green Economy are generally not focusing on the economic aspects and impacts of a greener economy.

At the same time, the countries face unsolved challenges related to unemployment, poverty and high inequality. These problems are perceived as not related or even contradictory to the implementation of Green Economy, which (based on information from the interviewed stakeholders) is not seen as a tool to enhance competitiveness, open new markets and create new jobs.

Finally, another important hindrance to the implementation of Green Economy is the specific nature of the countries' geographies. Low population density and small market sizes, especially in smaller countries such as Benin, or very scarcely populated countries such as Namibia, prevent market based approaches from being profitable. Transport costs, as well as high unit costs resulting from small production quantities are critical challenges when it comes to the development of new and greener economic sectors.

5 Conclusions

While it is clear that there is no one solution with regards to Green Economy in the African context, there are a number of trends that can be observed. First of all, there is a clear necessity for Sub-Saharan economies to opt for a more sustainable development of their natural resources, and to adapt to the challenges arising from climate change and environmental degradation sooner rather than later. There is also the necessity to preserve the natural resource base in a way that ensures that economic development will be possible in the future. But, in an African context, fostering greener economies is not just a necessity or a challenge. The country studies that were the base for this article revealed that Green Economy bears potentials that can contribute to economic growth and sustainable development already today. Many 'green' markets, such as biotrade, organic agriculture or sustainable tourism, may be small today, but as consumer patterns are changing, and as policies are being put in place to foster greener growth, they

are likely to grow further — giving first movers the opportunity to gain from global change. At the same time, the immense need for new energy sources provides a huge opportunity to capitalise on the existing potential of renewable energy resources. However, while these potentials exist, the private sector in the countries analysed has hardly capitalised on them due to poorly developed domestic markets, a lack of human and institutional capacity, as well as limited government support and a lack of examples and good practices.

Also, while strongly advocating for an optimistic viewpoint with regards to the potentials of Green Economy, it should not be assumed that greening African economies will be a silver bullet to solve the development challenges ahead. Greener economies are not automatically more inclusive, they do not per se offer economic opportunities for the poor, and trade-offs between 'growth' and 'green' will occur — in Africa just as all around the globe. Taking careful decisions on these trade-offs, designing the Green Economy in an inclusive way and making the most out of the potentials described will be a challenge that policy-makers, businesses and civil societies will have to confront.

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KAZAKHSTAN – Resources and the Green Economy

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1 Introduction

Kazakhstan is not only rich in fossil energy resources, but also ranks among the top ten countries in terms of proven reserves of uranium, lead, zinc, copper, chromium, iron, tin and gold. Its economy is driven mainly by exports of mineral resources (74.8 percent of total exports in 2010), with oil exports forming the major bulk (Agency of Statistics of the Republic of Kazakhstan 2012). Oil production is projected to more than double by 2020. Per capita gross domestic product (GDP) has more than doubled from 1,229 US dollar since 2000 to 2,629 US dollar in 2011 (in constant 2000 US dollar) (World Bank 2012). In addition, the country is very ambitious and aims to become one of the 50 most competitive developed countries.

Kazakhstan is also one of the most energy and carbon intensive economies. Energy intensity of GPD (purchasing power parity) in 2009 was 0.49 tonnes of oil equivalent per thousand 2000 US dollar in Kazakhstan, while the same indicator was only 0.16 on average for the member countries of the Organisation for Economic Co-operation and Development (OECD) and 0.19 on average for the world. The reasons behind this are the huge share of the energy sector in total GDP and the industrial structures inherited from the Soviet Union. The carbon intensity measured in kilogrammes of carbon dioxide per unit of GDP (purchasing power parity) in the same year was 1.42 kilogrammes of carbon dioxide per 2000 US dollar in Kazakhstan, while 0.38 on average for OECD countries, and 0.45 on average for the world (IEA 2013). This is due to the dominance of coal in electricity generation, centralised heating and to the low efficiency of

the power and heating as well as combined heat and power plants built during the Soviet period. About 40 percent of all power plants are older than 30 years (KazNIPIITES Energia 2010). Energy efficiency has so far not been a priority in this energy resource-rich country.

The grave downside risks of resource intensive 'brown growth' will however become ever more apparent. Export products that do not satisfy advanced ecological standards are facing increasingly difficult market prospects in the 'greener' states of Europe, North America and East Asia. Furthermore, the inefficient use of energy represents a waste of finite resources that could be more profitably sold on world markets. Domestically, overexploitation of natural resources such as soil and water can seriously jeopardise the future potential for overall growth. Low diversification of the economy makes Kazakhstan very dependent on volatile commodity prices.

Today, in fact, the country is among the first natural resource-rich countries outside the EU that have decided to focus on a Green Economy development path. In order to support this statement, the key components of the debate on Green Economy in Kazakhstan will be discussed, including the history of environmental initiatives and the challenge of diversification in the Kazakh economy. Secondly, an analysis of the international influence on the national debate will follow. Thirdly, the implementation of the Green Economy will be described. Finally, an outlook on the perspectives of the Green Economy in Kazakhstan will be given.

2 Key Components of the Debate on 'Green Economy' in Kazakhstan

2.1 Environmental Problems in Kazakhstan

The discussion on Green Economy in Kazakhstan has at least two major roots. The first is the environment. Kazakhstan has huge environmental problems, many of them inherited from the Soviet period when resource efficiency and the preservation of nature and the environment were not a priority. On the contrary, resource abundance and an extensive production path gave way to tremendous wastage of resources. In order to tackle these problems, the Kazakh Development Strategy until 2030 was adopted in 1997,[1] with the incorporation

1 This strategy is now obsolete as the President's speech in December 2012 required the development of a new strategy. As a result, the broad Kazakhstan 2050 initiative emerged.

of a National Environment Action Plan (Utegenova 2010). The Ministry of Environment Protection was set up and is in charge of all environmental issues, as well as currently coordinating the Green Economy development.

In the second half of the 1990s, other programmes that focus directly on environment and nature protection as aspects of the overall strategy had been implemented. These included: the National Environment Action Plan for Sustainable Development, the National Plan to Combat Desertification, the National Biological Diversity Conservation Plan, the Programme for the Development of a System of Protected Areas in the Republic of Kazakhstan, the Programme for Conservation and Sustainable Use of Water Resources, etc.

There are also several environmental non-governmental organisations (NGOs) active in Kazakhstan, which try to raise awareness of environmental problems and which have joined forces in Kazakhstan's Ecoforum, an independent association of ecological NGOs. Ecoforum is represented in the Council for Sustainable Development of the Republic of Kazakhstan under the Government of the Republic of Kazakhstan and other environment-related councils. It regularly participates in meetings of the Ministry of Environment Protection, but so far real impact on designing a Green Economy is rather limited. However, in the past, ecological NGOs have already demonstrated their possible influence on political decisions related to the environment. One example was a wide-scale campaign against importing nuclear waste to Kazakhstan. In 2001, the company Kazatomprom, which deals with nuclear industry issues, had actively advocated amendments to the existing law in order to allow commercial imports and the disposal of radioactive waste in Kazakhstan. Due to NGO actions, this initiative was rejected.

1.2 Need to Diversify the Kazakh Economy

The second root is the aim to diversify the economy, which is heavily dependent on natural resource exports as mentioned above. As early as May 2003, a strategy for innovative industrial development until 2015 was approved (Republic of Kazakhstan 2003). This strategy was elaborated under the leadership of the Ministry of Economy. The goal formulated in this strategy was to achieve sustainable development by economic diversification, moving away from the domination of natural resource extraction, and towards enlargement of the manufacturing sectors in the economy. Thus, sustainability was understood here as a decrease in economic dependency on volatile world market prices for natural resources, especially crude oil. During the financial crisis in 2008, which was accompa-

nied by a decline in raw materials exports and prices due to shrinking demand, Kazakhstan suffered in particular from this dependency (GTAI 2010). A set of additional concepts and strategies were adopted with the aim of achieving economic, social, environmental and political balance in the country's development. To integrate environmental and development issues, the Council for Sustainable Development was established under the prime minister. This council includes representatives of the ministries of economy, finance, energy and agriculture, as well as local bodies, NGO representatives and international organisations. Moreover, state inter-agency commissions (IACs), which are specialised organisations and institutions to address various inter-sectoral issues, have been set up and are operating in Kazakhstan. Commissions involve representatives of national ministries and agencies, businesses and trade unions as well as NGOs. In order to strengthen coordination in the development of a strategy for a Green Economy, a special high-ranking working group under the Cabinet of Ministers was established at the end of 2012.

The term 'Green Economy' was first mentioned in the Green Development ('Жасыл-Даму') Programme for economic sectors for 2010–2014, adopted on 10 September 2010. This programme was based on the Presidential Decree of 1 February 2010 on the forming of a development strategy for Kazakhstan until 2020. The development strategy until 2020 has made the reduction of GHG emissions a strategic goal, understanding that such a goal would spur necessary technological modernisation in the industry. This strategy also set the goal to reduce energy intensity of GDP by at least 25 percent by 2020.

The Green Development Programme showed a broader understanding of the term, also considering ecology as an important factor by defining Green Economy as an approach to decreasing dependency on the extraction of natural resources and to address the ecological consequences of such an economic growth path (Government of the Republic of Kazakhstan 2010). The programme aims at decreasing the influence of anthropogenic gases on the environment and health, protecting and rehabilitating the ecosystem, and improving the eco-management system. The measures considered include goals for the reduction of emissions and waste and for the protection of biodiversity.

The concept of Green Growth has furthermore received political support directly from the President of the Republic of Kazakhstan, whose long term aim is to build the fundament for a low-carbon, resource-efficient and social national economy on a sound basis. The share of 'clean' industries should grow and new jobs should be created by economic diversification.

This discussion was further spurred by Kazakhstan hosting two major international conferences in Astana in 2010 and 2011. In autumn 2010 the Sixth Ministerial Conference on Environment and Development in Asia and the Pacific was jointly organised by the Republic of Kazakhstan and the United Nations Economic and Social Commission for Asia and the Pacific. During the conference, Kazakhstan announced its Green Bridge Astana Initiative (GBPP 2013). The initiative aims to become a practical mechanism to support countries in their efforts towards greening their economies by developing regional, interregional and inter-sectoral cooperation, as well as creating an environment for the introduction of 'green' economy principles in Europe, Asia and the Pacific. This approach was further strengthened during the Pan-European Conference 'Environment for Europe', organised in Astana in 2011. The discussions provided a contribution to the preparatory process for the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference), where Green Economy in the context of sustainable development and poverty eradication was one of the two main themes.

At the Rio+20 conference in Brazil, the Green Bridge Astana Initiative was supported by many other countries, including Brazil and Russia, and included into the final document of the Conference as a practical mechanism "open for participation by all partners".

In summer 2012, the Kazakh government decided to follow the development path of Green Growth and a Green Economy. The President of Kazakhstan mandated the Kazakh government to work out a strategy for green and sustainable development. Within the government, the Ministry of Environment was nominated as coordinating body. In December 2012, in his speech to the people of Kazakhstan, the President called for the establishment of a strategy for the Development of Kazakhstan until 2050. This strategy aims to continue the path of sustainable development and find answers to the new political, economic and social challenges, which are much broader than green economy, environment, biodiversity etc., and include social policy, ethnic challenges, education, statehood and the development of democracy, foreign policy and global security. The strategy should help achieve the announced ambitious overall goal to enter the top-30 club of most developed states in the world by 2050. In addition, he outlined that by that time alternative and renewable energy sources should account for at least half of the country's total energy consumption (Government of the Republic of Kazakhstan 2012b). This new strategy is expected to replace the other existing strategies.

3 Influence of International Regulation on the National Debate

There is a third component influencing the discussion on a Green Economy in Kazakhstan: the Kyoto Protocol and the international negotiation process on mitigating climate change. In 2009, Kazakhstan ratified the Kyoto Protocol as a late-comer and aimed to become an Annex B Party. The objective to become an Annex B Party was not only based on Kazakhstan's self-perception as an industrialised country comparable to Ukraine, Russia and Belarus, but also on awareness of the opportunities arising from emission trading and the project-based flexible mechanisms of the Kyoto Protocol. So far, its initiatives have not been successful and no national budget of greenhouse gas (GHG) emissions allowances for Kazakhstan has been internationally approved under the first commitment period of the Kyoto Protocol. As a consequence, the country could not use the Kyoto flexible mechanisms. However, following its intention to reduce GHG emissions, the Kazakh government decided to introduce a GHG emission trading scheme for its major emitters in order to push its industry towards low-carbon modernisation. The Kazakh Ministry of Environment Protection is in charge of developing and implementing the system.

Kazakhstan has taken on a voluntary obligation to decrease GHG emissions by 15 percent by 2020 and by 25 percent by 2050, both compared to the level of 1992. In 2010, a draft Plan of the Republic of Kazakhstan on the Transition to Low-Carbon Development till 2050 was produced by the Ministry of Environment Protection in order to meet its quantified emission reduction commitments, to improve energy safety and living standards.[2] The plan was developed with support from the United Nations Development Programme (UNDP) and outlined the following priority areas:

- Improvement of energy efficiency in all economy sectors to reduce the expected level of energy consumption;
- Acceleration of renewable energy development on the basis of using hydro and wind power, biomass energy, biologically decomposable and combustible wastes, and solar and geothermal energy to substitute high-emission technologies being used and meet the growing demand;

2 In 2012 the government made an official decision to reduce Kazakhstan's national GHG emissions by 15 percent by 2020, compared to 1990.

- Regulation of national GHG emissions through the organisation and functioning of the national market on quotas for GHG emissions;
- Population awareness raising on methods to mitigate anthropogenic impacts on climate change (Orazkeldykyzy 2011).

However, this plan was not adopted. At the end of 2011, the Environmental Code was amended in order to establish the legal framework for developing GHG emission trading. A National Allocation Plan for the planned pilot phase of the national emission trading scheme in 2013 was approved in December 2012 (Government of the Republic of Kazakhstan 2012a). Compliance with the system could be a challenging task for the 177 companies participating in this national trading scheme should an ambitious cap on carbon emissions be set. This is especially true for the power sector, which to a huge extent was built in the 1960s and 1970s and has lacked modernisation during the last three decades. The system, which is aiming to set a price for carbon, could also be a challenge for the socio-economic policy of the Kazakh government, which is actually still in favour of regulated low energy tariffs.

Green development or Green Economy in Kazakhstan is thus understood in a wider sense, as the discussion is not only about de-carbonisation of the economy and new directions of economic growth, but also concerns sustainability in the sense of securing ecological sustainability and biodiversity.

4 Implementation of a Green Economy – Institutions and Instruments

Although progress has been achieved, the institutional system in place to deal with current and arising developmental challenges is still weak, and is characterised by:

- Insufficient status and capacities of governmental, scientific and other organisations to address the challenges of sustainable development;
- Unfavourable legislation and a lack of economic incentives to reduce pollution, to save natural resources, to introduce innovations and green technologies and to attract ecological investment;
- Undeveloped civil society and poor public participation in decision–making; NGOs, in spite of their membership in various commissions and other pro-

cesses do not have a measurable and systematic impact on the current environmental policy.

The Ministry of Environmental Protection, governmental bodies for the protection of water, land, and other resources do not possess sufficient technical, organisational, or staff capacity. The status of the environment protection bodies is low, the legislative framework and civil society are still underdeveloped and public participation in policy decision-making is poor.

The role of the state for economic development and investment is enormous. This is firstly due to the fact that the state holds major assets in natural resource extraction and manufacturing industries. The money earned from resource exports is put into different state-owned development and stabilisation funds. Secondly, decision-making is very centralised and the President himself is very active in initiating new ideas and programmes. Therefore, mainly direct policies are implemented in the form of programmes, plans and strategies, and fewer indirect policies are put in place to set incentives for market actors.

At the moment, the instruments in place to reach the goals of a Green Economy are so-called sectoral programmes, which are devised by the Ministry of Industry and New Technologies as lead institution. They define major investment projects to be implemented in different industries. The centralisation of the management of the country's industrial and energy assets within the Sustainable Development Fund 'Kazyna', later reformed into a state-owned holding company and renamed 'Samruk-Kazyna', is another instrument the Kazakh government has set up to coordinate public investment in line with the approved strategies and programmes, and to be the partner for foreign investors. The company had adopted a Concept of Sustainable Development until 2024, comprising a broad list of perspective targets. However, this concept was cancelled in 2011 because of considerable differences between the sustainable development targets set in the concept and the sectoral targets of other branch programmes and strategies. Thus, a new programme was adopted in the same year called the National Programme of Forced Industrial and Innovative Development of the Republic of Kazakhstan for the Years 2010–2014. In addition, efforts were made to improve the instruments for implementation of that programme. Public-private partnership, techno-parks, industrial and free economic zones, social and business corporations, as well as metallurgical centres in the East-Kazakhstan region, and oil and gas technology centres in the Caspian region are the main new instruments to spur investment.

However, financing for their implementation requires additional investment by foreign capital and cannot be completely covered by the Kazakh public budget. So far, foreign investment was lower than expected for the implementation of the state investment programmes. Although an international survey carried out by Ernst and Young in 2012 stated that the investment climate in Kazakhstan has improved over the last years, further improvement seems to be necessary. This relates especially to low qualification of employees, insufficient development of transportation and logistics infrastructure, as well as the need for improved stability of the legal and regulatory framework for foreign investment in Kazakhstan (Ernst and Young 2012).

In addition, looking at the environmental side of the Green Economy approach, the experience gained since the beginning of the 1990s has shown that the efforts of the country and international organisations have not led to a significant improvement of environmental quality. For example, the situation with the Aral, Caspian and Balkhash basins remains critical, as does the degradation of land resources and highly inefficient use of water, among other problem areas. Such policy instruments as the ecosystem approach and strategic environmental assessment remain underdeveloped and they have not become a proper instrument for the development and implementation of strategies on the development of the country, sectors and areas. Short-term interests, frequent institutional changes and on-going reforms are an obstacle to the transition to sustainable energy and agriculture. They also block support for ecosystem services, sustainable tourism and other sectors of the Green Economy that are important for the population and the future of the country. Thus, for example the reforms of the energy sector during the last ten years did not lead to substantial changes in the energy sector; neither did the implemented reforms in the environmental sector tackle the soviet-period standards and regulations on air, water and waste treatment.

5 Outlook

The national GHG emission trading scheme and the Green Bridge programme — self-binding commitment by the Kazakh government — will be major drivers for further steps towards building a Green Economy. Both activities might be understood as a practical and voluntary mechanism for the development of a long-term partnership between developed and developing countries for the

transfer of green technology and of best available experiences on the regional and inter-regional levels. This is especially important for Kazakhstan and Central Asia in general, where currently research and development as well as the innovative potentials are low. Therefore, a mid-term perspective would be based on green technology transfers from abroad and on the gradual development of national research and development and innovative potentials in selected sectors (for example, metal manufacturing and extractive industries as well as the pharmaceutical and chemical industries) that are important for the national economy and where preconditions exist to develop such a potential in a mid-term perspective.

The Green Bridge programme might also raise political awareness for the specific issue of Green Growth within the government, the public and the business sectors. Some initiatives are known where foreign institutions support the Kazakh government in developing a Green Growth Strategy by providing respective expertise and know-how. One is led by the DIW and DIW econ (the German Institute for Economic Research and its consultancy branch) and supported by the International Climate Change Initiative of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in Germany. The other was led by the South Korean Global Green Growth Institute with financial support from the European Bank for Reconstruction and Development and had delivered a report at the end of 2012.

In addition, at the end of 2012 a well-known international consulting company was hired by the Kazakh government to help the Kazakh Ministry of Environment Protection design a Green Economy strategy which was officially approved in 2013. This strategy focusses on major sectors of the economy including energy, industry and mining, transport, sustainable agriculture, waste and water management as well as urban planning, and is expected to push forward the Green Economy development with qualified policies. However, this strategy faced opposition from other ministries and industries, especially from coal mining and coal-fired electricity generation. Prices for Kazakh coal are low as external effects are socialised and not included in current prices. In addition, the coal industry is an important employer. Therefore, the weight of the Green Economy Strategy within the Development of Kazakhstan Strategy until 2050 is not yet clearly determined.

There is still much to do in order pave the way for a Green Economy in Kazakhstan:

1) Some of the manifold, relevant existing development programmes and strategies need to be revised and adjusted to a focus on a Green Economy.

2) For sectors that are not covered by the national GHG emission trading system, coherent GHG emission reduction policies need to be developed and implemented.

3) The tariff policy related to energy and natural resources needs to be adjusted. For instance, low tariffs for water have led to an annual deficit of means for investment in this sector, and to a growing degradation of water-supply systems. The level of worn-out water treatment facilities is as much as 75 percent and has reached the critical level.

4) The analytical basis and the capacities for political decision-making on the field of Green Economy need to be improved. Helpful instruments could be:
   - Implementation of Strategic Environmental Assessment;
   - Implementation of a national Monitoring, Reporting and Verification (MRV) system. Related to the national GHG emissions trading system, a respective MRV system will be implemented. An enlargement of this MRV system for all other sectors would be helpful.

The urgency of many environmental problems, such as the irrevocable processes of ecosystem destruction, requires urgent measures to be undertaken. In this respect, international support for capacity building is required, as well as a longer-term framework for partnership for the transition to a green economy in Kazakhstan. Thus, there is much hope in Kazakhstan for the Green Bridge partnership programme becoming the main driver for further development.

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RUSSIA – Between an Export-Oriented Raw Materials Economy and Green Economy

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1 Introduction

The concept of green economy is new for Russia, and it is not actually used in official documents. Nevertheless, the term 'green economy' has become increasingly used in scientific discussions, speeches by officials, and the mass media, especially with regard to the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference). The Prime Minister of Russia Dmitry Medvedev, who represented the country in Rio, pointed out the need for a new paradigm of development and transition to a green economy. He stressed that "society, economy and nature — are inseparable. That's why we need a new paradigm of development that is capable of ensuring the welfare of society without putting pressure on nature. The interests of the economy, on the one hand, and the conservation of nature, on the other hand, must be balanced and should focus on the long run. At the same time, innovative growth and the growth of energy efficiency — a so-called 'green' economy — are needed. This is definitely beneficial to all countries" (Russian Government 2012). In preparation for the Rio+20 conference, Russia presented a Report on the implementation of the principles of sustainable development in the Russian Federation, providing information on the Russian perspective on the sustainable development paradigm in the country, as well as achievements and challenges in this respect (Russian Federation 2012).

2 Green Economy and Russian State Policy

Russia's planned targets for the next 10 to 20 years largely correspond with the objectives of a transition to a green economy. This is reflected in the general policy of resource utilisation and environmental protection for the future, and the existing legal and fiscal instruments. Perhaps the major task for the Russian economy at present is to shift from a resource-based to a more diversified economic structure. It is reflected in the basic documents of the country's medium and long-term performances, and speeches by the President and the Prime Minister. Moreover, the social and environmental goals of the green economy are mostly included in basic concept papers for the future, such as, in particular, in the Concept of Long-Term Development (2008), the Strategy of Long-Term Development 2020 (2012), the basis of state policy in the field of environmental development of the Russian Federation for the period until 2030 (2012), amongst others.

Although the term 'green economy' itself was not mentioned in the last document, the strategic goal of state policy in the field of environmental development until 2030 is proclaimed as "solving social and economic problems, providing an environmentally-oriented economic growth". In this context, the term "environmentally-oriented economic growth" is largely the same as the term "growth of the green economy".

The main principles for the development of the Russian resource base and environmental protection are reflected in the new State Programmes 'Reproduction and Use of Natural Resources' in the period of 2013–2020 (2013) and 'Environmental Protection' in the period of 2012–2020 (2014), elaborated by the Ministry of Natural Resources and Environment of Russia. The enhancement of energy efficiency is a key objective of green economy and it is also a priority for Russia. It is included in the Energy Strategy 2030 (2010), in the Presidential Decree titled 'Concerning some measures for improving the energy and ecological efficiency of the Russian economy' (2008), and in the Federal Law on Saving Energy and Increasing Energy Efficiency (2009). Other priorities for the development of a green economy are reflected in the long-term programmes for natural resources, in particular: for energy, including renewables — in the Energy Strategy 2030 mentioned above; for water — in the Federal Targeted Programme 'Pure Water' on the development of the water sector in the Russian Federation in the years 2012–2020 (2012); for soil — in the State Programme for

Agricultural Development and Agricultural Products, Raw Materials and Food Markets Regulation for 2013–2020 (2012); and for fisheries — in the State Programme for the Development of the Fishery Sector in the period 2013–2020 (2012).

Since the 1990s, Russian legislators have been developing the environmental legal framework and policy documents quite actively. Besides the ones mentioned above, the following documents should be noted here: basic principles of the Russian Federation's state strategy to protect the environment and ensure sustainable development (1994), Presidential Decree 'On the concept of the Russian Federation's transition to sustainable development' (1996), the Ecological Doctrine of the Russian Federation (2002), the Federal Targeted Programme of the Russian Federation on Ecology and Natural Resources (2002–2010), among others. A new Federal Law on environmental protection was approved in 2002. The Water and Forest Codes have been adopted recently. In 2014 Russia has adopted a law introducing the conception of the best available technologies that could form the basis of modernisation, structural and technological changes, and the greening of economy.

Although low-carbon development and climate changes are not popular topics in academic, political and economic circles in Russia, the interest in these topics is growing. The adoption of the Climate Doctrine (2009) by the Russian government was an important decision for transition to the green economy. The Doctrine requires the development of energy efficiency in all sectors of the economy, in particular: energy-saving measures in industrial and infrastructure facilities, including energy-loss reduction in transportation, increasing the fuel efficiency of vehicles and energy efficiency of buildings, as well as the development of renewable and alternative energy sources. In 2011 a comprehensive government plan was adopted for the implementation of the Climate Doctrine for the period up to 2020. In 2015, the Government approved the Conception of formation of the monitoring, reporting and verification system of the greenhouse gas emissions volume in the Russian Federation. Russia has established a system of Joint Implementation projects approval. According to the Sberbank of Russia, acting on behalf of the Russian government as the carbon units operator, as part of the economic mechanisms of the Kyoto Protocol, Russian companies filed for approval of 150 projects with a total approved emissions units of 384.6 million tonnes of carbon dioxide equivalents (UNDP 2013).

The key Russian agencies for greening the economy are the Ministry of Natural Resources and Environment, the Ministry of Agriculture, the Ministry of the

Economy, and the Ministry of Energy. The Ministry of Natural Resources and Environment plays the most important role in this respect. Some experts say that Russia needs a separate environmental structure as the Ministry combines the functions of natural resources use and environmental protection, which creates a certain contradiction.

Russia understands the importance of bilateral and multilateral cooperation in the process towards greening its economy. For example, in 2013 the Ministry of Natural Resources and Environment of the Russian Federation has developed a special plan of action for the implementation in Russian legislation and practice of the recommendations on environmental issues issued by the Organisation for Economic Co-operation and Development for the years 2014–2022.

3 The Russian Economy, Natural Capital and the Environment

First and foremost, prospects for development in Russia towards realising the green economy are determined by the fact that the country is very rich in natural resources and also has a considerable human potential. That reflects both opportunities and threats for the development of a green economy in Russia. Natural wealth offers good possibilities for the country's development, and an increase in wealth and quality of life. Nevertheless, Russia's natural wealth is to be found not only in its natural resources, but also in its richness of ecosystems. Therefore, efforts towards the development of a green economy in Russia could help to position the country in the world not only as an energy superpower, but also as an ecological donor that, in turn, could help to gain benefits from ecosystems. An important feature of the Russian position on Rio+20 was an understanding of this role in the world (forest, water and other natural resources and ecosystems). In the National Report, it is noted that in light of the country's problems transitioning to sustainable development, green economy should be addressed not only for the benefit of present and future generations of Russians, but of all mankind (Russian Federation 2012). At the same time, the current export-oriented resource-based direction of economic development entails significant risks associated with growing dependence on the natural-resource market, a loss of competitiveness, the depletion and degradation of natural wealth, and an increase of environmental pollution.

Table 1: Basic indicators of natural resource usage and the impact on the environment in Russia (1990–2014)

	1990	1995	2000	2005	2008	2009	2010	2014
Oil *(million tonnes)*	516	307	324	470	488	494	506	525
Natural gas *(billion cubic metres)*	641	595	584	641	664	583	651	639
Coal *(million tonnes)*	395	263	258	299	326	301	322	356
Water intake from natural sources *(billion cubic metres)*	106.1	86.6	75.9	69.3	69.5	64.7	69.7	61.0[3]
Area under crops in agriculture *(million hectares)*	117.7	102.6	84.7	75.8	76.9	77.8	75.2	78.5
Timber hauling *(million cubic metres)*	…	116	94.8	113	108	97.1	…	…
Emission of polluting substances *(million tonnes)* including:	55.1	32.3	32.3	35.8	37.4	32.5	32.4	32.1[3]
– from stationary sources	34.1	21.3	18.8	20.4	20.1	19.0	19.1	18.4[3]
– from the transport	21.0	11.0	13.5	15.4	17.3	13.5	13.2	13.6[3]
Waste discharge *(billion cubic metres)*	27.8	24.5	20.3	17.7	17.1	15.9	16.5	15.2[3]
Broken land due to non-agricultural activities *(thousand hectares)*	119.3	83.4	54.6	35.1	46.2[1]	…	…	…
Waste *(million tonnes)*[2]	…	83.3	127.5	3035.5	3876.9	3505.0	3735.0	5168.0

Source: RosStat 2005, 2007, 2011, 2015

1 Data for 2007.

2 Before 2002 – toxic wastes; since 2002 – wastes of production and consumption (from I to IV danger class for environment).

3 Data for 2013.

The country's natural capital can play a dual role for the Earth. On the one hand, Russia's natural resources are a storehouse for the development of the global economy by providing resources to many countries around the world. On the other hand, the majority of the stock is located on sites that are until now preserved and undisturbed by economic activity. Their large-scale development and introduction into economic turnover could have a negative impact on the global ecological balance.

In general, during the period of 1990–2000 there was a reduction in the environmental impact of the Russian energy sector as a result of reduction in the production of oil and coal (Table 1). In the agricultural sector, the harvested area has decreased by 36 percent. For two decades, sewage discharge has decreased by almost 40 percent, as did emissions into the air, as well as freshwater withdrawals from water bodies, which have decreased by 32 percent. However, the trend of reduction of pollution and resource use, which had started in 1990, has turned since 1999 with the beginning of economic recovery: air pollution from stationary sources started growing again, energy sources production has again increased, particularly oil extraction, which shows an increase of 1.6 times compared to figures for 2000. Moreover, the problem of waste has now become urgent as its volume has grown 1.5 times since 2005.

Russia has a significant environmental impact in terms of greenhouse gas emissions. The country ranks fourth in the world regarding greenhouse gas (GHG) emissions (five percent) and most likely, its share will decline (UNDP 2011), and the energy intensity of the Russian economy should be reduced by 40 percent by 2020. In accordance with the obligations of the Kyoto Protocol, the country's GHG emissions levels must not be greater than in 1990 during the first budget period of the protocol (2008–2012). The current level of carbon dioxide emissions is only 70 percent of the 1990 level. According to the Russian Presidential Decree (2013) by 2020 greenhouse gas emissions should be no more than 75 percent of the 1990 level (President of the Russian Federation 2013).

Existing studies, including reports by RosHydromet (Russian Hydrometeorology Service), indicate that Russia may face serious problems due to global climate change (RosHydromet 2012). According to experts at the World Bank, Russia could become the most vulnerable country in Eastern Europe and Central Asia as a result of global climate change (World Bank 2009b). According to estimates, within a few decades the total damage from climate change to Russia's economy could reach 10 billion US dollar, due to the increasing number of natural disasters and catastrophes in the country (World Bank 2009b).

Because of the size of its territory and population, the high energy intensity of the economy as well as its outdated and relatively inefficient production capacities, Russia could play an important role in the implementation of international programmes on emission reduction. Without prejudice to its economic development, Russia could effectively implement measures to improve energy efficiency and reduce emissions at relatively low cost. According to experts at McKinsey & Company, the country has the greatest relative potential for emissions reduction by utilising cost-effective measures in comparison with Brazil, India or China (McKinsey & Company 2010). Russia could also be the largest player in the carbon credits market. Nevertheless, due to the delays in carrying out the necessary procedures, the country has actually not made use of the associated benefits, in particular the opportunities to receive hundreds of millions of euros for trading carbon quotas. In comparison, Ukraine traded its carbon quotas for the price of almost half a billion euros. At the global level, the post-Kyoto period of a trading scheme and international regulation could be an opportunity for determining the pace and scale of the Russian transition to a green economy.

The growth of natural resources exploitation and of the export-oriented resource-based economy was supported by the favourable global pricing trends of the 2000s. The average export price of Russian oil and gas increased by four to five times in the period of 1995–2010. The crisis that began in 2008 however showed that the most dangerous threat to Russia's existing economic model was a sharp decline in energy prices on the world markets. Russia's economy is now substantially dependent on high energy prices being maintained.

4 Energy Sector

Modernisation of the energy sector, a key sector for Russia, is of critical importance for the transition to a green economy. The energy sector plays a leading role for the Russian economy in terms of gross domestic product (GDP) share, taxes, revenues, employment, and export revenues. In view of Russia's plans to increase its production of energy, the dominant role of the energy sector in the economy will be the same in the future. It is also necessary to mention a significant negative impact of energy on public health due to the leading role of the energy sector in environmental pollution in the country (UNDP 2009).

From 2008 to 2011, key elements of the green economy laid the basis for the President's and the government's solutions to improve the energy and environ-

mental efficiency of the economy by 40 percent by 2020, increasing the share of renewable energy in the total energy production from less than one percent to 4.5 percent by 2020 (UNDP 2013). The country ranks first in the world in terms of production of oil, second in natural gas, third in coal. Compared to 1995, there was a significant increase in the production of energy resources, especially oil — by 1.6 times; natural gas production increased by nine percent, coal by 21 percent (Table 1). This situation also contributed to establishing higher energy prices in the years after 2000. At the same time, the energy sector is responsible for the largest contribution to environmental pollution in Russia, natural resource depletion and degradation of unspoilt areas. The sector accounts for about 50 percent of emissions of harmful substances into the atmosphere from stationary sources, over 60 percent of polluted wastewater, approximately 90 percent of production and consumption waste, and four-fifths of total GHG emissions (Ministry of Natural Resources and Environment 2011). This situation is not typical for the vast majority of countries, where energy reserves are low or not present at all, for example, most EU countries.

In the energy sector, it is necessary to ensure both the safe use of traditional resources, and energy efficiency. On this pathway, it would be possible to realise huge reserves: Russia could save 45 percent of its total primary energy consumption, which equals the annual consumption of primary energy in a country such as France (World Bank 2009a). This requires a radical technological renovation and modernisation of the economy. Energy efficiency in Russia is two to four times lower than in developed countries due to technological backwardness.

The priority feature of green economy growth in Russia is a radical increase in energy efficiency, which is extremely challenging. The problem of the huge reserves and loss of energy was highlighted in the Presidential Decree (2008), Russian Energy Strategy 2030, and the latest research in Russia by the World Bank, McKinsey & Company and the Russian Centre for Energy Efficiency (McKinsey & Company 2010, World Bank 2009a). The economic logic of the approaches presented in these documents is clear enough: in a country with relatively simple technology it is possible to save almost half the energy consumed. Improving energy efficiency will require three times less investment compared to a gross increase of energy production: 320 billion US dollar against more than one trillion US dollar to scale production. Investments in energy efficiency will benefit approximately 120 to 150 billion US dollar a year and can be paid back within two to four years. This indicator is 3 to 4 times lower than the world average.

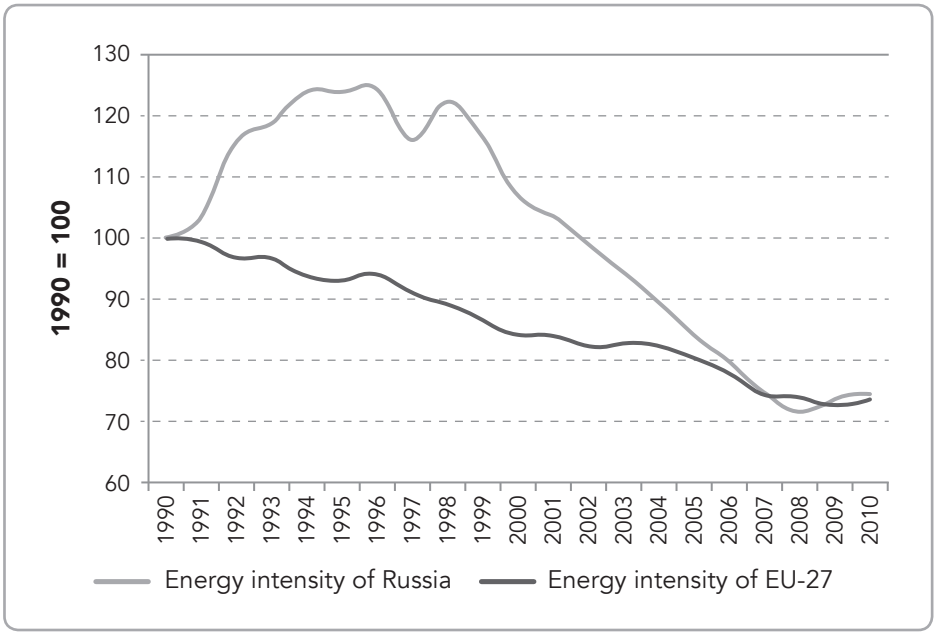
A catalytic, regulatory, and even coercive role of the government to improve energy efficiency is very important. Currently, the gross increase in energy production is supported by many lobbies (oil, gas, nuclear, power generation, etc.) and energy efficiency has no real support groups in businesses, government, and society.

5 Economic Instruments and Monitoring for Green Economy Transition

To move towards green economy, Russia would need a long period of transformation and modernisation of its economy, as well as substantial structural and technological changes. During this transitional period, the energy sector will certainly remain the main driver of the economy. An important task is to reduce the costs associated with such a transition, and to radically increase the efficiency of natural resource use. Firstly, it is necessary to strengthen the effectiveness of state regulation in the area of extraction and production of resources. With the assistance of economic and legal instruments (taxes, fees, tariff policy, penalties, compliance with regulations and standards, etc.), it is essential to make state and private monopoly companies improve their efficiency of resource use, aiming at the prevention of losses; to adequately compensate the externalities and environmental damage, concerning society and nature. Secondly, it is important during the transition period to create a competitive environment, by increasing competition among producers and shifting from the current dominant monopolism in the economy. These factors may affect the reduction of costs and encourage businesses to implement innovations, to diversify production, and switch to a high-level processing of raw materials, which would increase efficiency and reduce nature intensity of production through the introduction of new technologies.

Among the macroeconomic challenges of transition to the green economy, the improvement of ineffective government regulation should be mentioned, above all with respect to taxation and subsidising. Conservation of the export-oriented resource-based economic model is underpinned by the budget and tax role of the energy sector. According to Russian government data, as much as half of the state budget — 49.2 percent in 2011 — is generated by oil and gas revenues. It is planned to reduce this share to 43.5 percent in 2014 (Russian Government 2011). The present situation where tax burdens on the manufacturing industries with low environmental impact are higher than in raw materials

Figure 1: Dynamics of energy intensity for Russia and EU-27 (1990 = 100 percent)



Source: World Bank 2012, BP 2011

and manufacturing industries also prevents structural changes in the economy. That does not contribute to a greening of the economy. For instance, in the production of machinery and equipment, the tax burden is 11.1 percent and in construction it is 11.3 percent, whereas it is set at only 3.3 percent in metallurgy and five percent in the production of coke and petroleum products (Russian Government 2011).

Currently, the Russian government is making efforts to change the situation in the area of subsidies and taxes in the raw materials sector. For example, in 2010 at the G20 Summit, Russia unveiled its strategy to rationalise and, in the medium term, to eliminate inefficient subsidies that encourage wasteful consumption of fossil fuels within the Energy Strategy 2030 and the Concept of Socio-Economic Development 2020. The government is taking steps to amend the Tax Code in this direction, for example to increase the rate of the mineral extraction tax (MET) on natural gas produced by Gazprom in 2012 by 50 percent — from 237 to 509 roubles per 1000 cubic metre; to 582 roubles in 2013; and to 622 roubles in 2014 (Safonova 2012).

For the transition to a green economy, monitoring the decoupling of economic growth and energy/resource intensity plays an important role. Russia's trend indicators of nature intensity and the pollution intensity (per unit) for the period of 1990–2010 may be considered positive. In the years after 2000, stabilisation/reduction in the use of natural resources and pollution, along with a dynamic growth of GDP, led to a significant reduction in the nature intensity and pollution intensity in the country. It seemed decoupling had been achieved. These are important indicators of progress towards a green economy. Energy intensity declined by 26 percent in 2010 compared to 1990. Water intensity (35 percent), air pollution intensity (42 percent) and water pollution intensity (30 percent) reduced even more significantly over the whole period (own estimations).

As a key positive trend for a greening of the economy, it is necessary to highlight the significant reduction in energy intensity in Russia (in 2010 to 69.8 percent compared to the level of 2000, and to 74.7 percent compared to the level of 1990) (Figure 1). After growing in the 1990s, this indicator decreased considerably after 2000, indicating the decoupling effect between energy intensity and overall economic growth. The rate of decline energy intensity in Russia was much higher than that in the European Union and the task is to keep these rates in the future.

However, the current energy intensity of the Russian economy is still high, and its reduction remains a priority. The pre-crisis years 2000–2008 were particularly successful for Russia, when energy intensity decreased by 35 percent — largely due to the rapid growth of GDP. This is one of the best results in the world. It should also be noted that Russia has already skimmed the structural 'cream' of the reduction of energy intensity, which requires significant efforts to further reduce this figure.

6 Conclusion

Russia is at a crossroads. Recent trends show a decline in the rate of economic growth and reduced investment in the economy. It is becoming apparent that the export-oriented raw materials model has exhausted the resources for its development. Under these circumstances, Russia must select a new model of development or continue to move towards a dead end by imposing a 'raw' trend of development. In the new model, important priorities may be associated with the formation of a green economy. The basic principles of this economy are reflected

in the concepts, strategies and programmes of the country. In this regard, a package of laws and programmes for energy efficiency should be noted as being of particular importance. In the state regulation, 'win-win' policy is very effective. The crisis poses difficulties to Russia's transition to a green economy. However, awareness of the need to choose a new path of development can contribute to the implementation of the principles of green economy in the country.

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OUTLOOK

Green Economy – on the Road to a Policy-Making Paradigm for the 21st Century?

by ***Dennis Tänzler, Alexander Carius*** *and* ***Elsa Semmling*** *(adelphi)*

One of the reasons to edit this volume has been to increase understanding of the actual relevance of the green economy concept. Is green economy just the private sector-compatible version of the sustainable development concept? Is it an attempt to finally implement the climate change agenda after the collapse of negotiations at the United Nations Climate Change Conference in Copenhagen in 2009? Is it relevant for decision makers around the world? If yes, what are the future prospects, and what are the main barriers to overcome? Is it even a paradigm shift in international environmental discourse?

To answer these questions, or at least some of them, we decided to follow two pathways complementing each other. First, we asked renowned experts who have been accompanying the international process on sustainable development for quite some time about the concept of green economy. Applying historical, political economy, and global governance perspectives, among others, these authors help to provide a comprehensive picture of where the green economy stands after the United Nations Conference on Sustainable Development in 2012 (Rio+20 conference). They explore potential ways of further developing the concept to ensure that it is also relevant for future sustainable development discourse.

It is undeniable that the Rio+20 process and the summit itself gave important momentum for a green transformation discourse as the final declaration encourages the countries to build a common understanding on how economic policy should be committed to sustainable development and poverty eradication. This discussion forms the conceptual basis for the second part of this book. We sought ideas from various countries on the overall status quo of green econ-

omy-related country approaches in the run up to and immediately after the Rio+20 Summit. Is there a green economy discourse in the country that goes beyond policy planning cycles and involves the broader public, including civil society and the private sector? What is the role of strategies and plans, and what can be expected from the implementation process? Do priorities in the various countries differ significantly from each other? And if yes, what is the best way to deal with a quite diversified picture when aiming at a coherent international process? In the following, we discuss major insights from the contributions to this book and try to give answers to these questions.

1 Green Economy – a Concept Under Pressure

Looking back to the Rio Summit of 2012 and the prominent role the green economy concept played at the time, it seems fair to say that scepticism is the guiding tone of most discussions on the prospects of the concept. 20 years after the United Nations Conference on Environment and Development in 1992 (Rio conference), numerous (mostly frustrating) climate change conferences were organised. The result is very limited success when it comes to real implementation and progress towards a more sustainable world. One obvious question therefore concerns the overall innovativeness and power of the concept: Can we consider the process towards green economies as a paradigm shift? How is the social dimension addressed, and what are the prospects for implementation?

1.1 A New Paradigm?

As *Mark Halle* outlines, green economy is not the new global economic paradigm after Rio+20, although it may be a viable option for many countries — not least as a response to the Global Financial Crisis widely considered as a failure of neoliberal economics. Framing it in this way may have some advantages: It offers an entry point to overcome fragmented economic organisation, and to address the choice between growth and sustainability, which has to be made by the countries themselves and not, or at least not primarily, as part of an international negotiation process. Thanks to this openness, the concept has the potential to instigate a process worthy of being called a paradigm shift, or even a revolution. In a historic comparison to the industrial revolution, *Dirk Messner* stresses that two paradigms currently co-exist — those of a high-carbon and a low-carbon

development. This is in part due to the fact that, at present, change is not a radical process; new concepts and ideas need time to be absorbed by societies. Establishing a new paradigm requires an on-going and non-linear process that creates the necessary legitimacy.

Dirk Messner further outlines that there are some specific characteristics to the process of a transformation towards a low-carbon economy that make it different to the industrial revolution a few centuries ago. The green economy discussion is an intentional process under extreme time pressure and has its main roots in the strategic discussions of policy-makers. At the same time, the transformation needs to take place at the global level, which requires an unprecedented degree of global cooperation. This is, however, not the most likely scenario to happen in light of recent global governance efforts. Last but not least, the overall direction related to our natural resource base is fundamentally different to the process of industrialisation. In the past, the objective was to overcome planetary boundaries; today there is the need to go back to planetary boundaries as a starting point.

While *Dirk Messner* is at least sceptical about the transformative potential of the green economy concept, *Ulrich Brand* clearly states that it is basically a continuation of a dominant capitalist rationality as it seeks a process of capitalist ecological modernisation that reinforces destructive economic aspects. Accordingly, only a radical restructuring can help stop the on-going destruction of nature, avoid more resource-related conflicts, and address the roots of social inequalities. In a similar way, *Sunita Narain* finds that the global community has to rethink and rework development paradigms for the future to make the world less economically vulnerable and more climate-secure.

1.2 A New Chance for Social Inclusion?

It is precisely on the issue of social inclusion where the green economy concept may address some of the shortcomings that have caused the relative decline in prominence of the sustainable development concept. As *Ulrich Brand* states, the existing non-sustainable modes of production, located essentially in the South, not only increase the geo-political rivalry for resources, but the local populations do not even benefit from resource extraction. According to *Ulrich Brand*, the green economy concept does not really address the root causes of poverty. *Michael Renner* describes with his focus on green jobs how this shortcoming can be addressed. He stresses that employment is the key to making an econ-

omy work for the people and that the greening of jobs must go hand in hand with improvement in social conditions.

Michael Renner's sectoral analysis indicates that the building sector, among others, offers a promising area to this end. Building accounts for one third of global energy end-use and the construction of new buildings as well as improving existing houses offer lots of employment opportunities. In other words, greening the building sector is labour intensive and could generate a large number of jobs. However, the prospects are significantly limited by the lack of skilled workers. *Michael Renner* calls us to consider the extent to which green jobs vary between countries and sectors and, perhaps more importantly, whether green jobs are necessarily decent jobs at all. Looking at the sectoral examples of forests and renewable energies, *Sunita Narain* illustrates the importance of designing green economy ideas carefully in an inclusive way so that environmental protection and socials benefits go hand in hand. Using the example of India's forest policy approach, she shows that a real green economy may hardly be an inclusive process, but the challenge remains to link the use of natural wealth with the wellbeing of the people. Her example also underlines the fact that the development of green economy indicators to measure green wealth still requires more conceptual work.

1.3 How to Get to the Green Economy?

As *Sunita Narain* outlines, the bottom line for a successful green economy approach is doing much more with less. However, as we can see in the case of climate change, the options for serious emission reduction in industrial production are still limited in the current industrial model, or require clear incentive structures and, as *Sunita Narain* also stresses, an on-going learning process. *Mark Halle* identifies the lack of a policy environment that is favourable to green economy as one of the major challenges for the success of the green economy concept. He argues that the self-interest of people is more important for actual behaviour than the ideal of a green economy. Green economy will thus only take place if people are convinced that self-interest is adequately served by related activities. Referring back to the social question, *Michael Renner* calls for government action to establish and enforce decent wage standards. In addition, he stresses the need for education, and training people to be able to participate in the green economy. Finally, the global sharing of lessons learned is required to promote the diffusion of successful practices. Coming from political practice,

Steven Stone from UNEP outlines how the green economy should be the result of a combination of bottom up and top down processes. Such a combined process is meeting the demands of those countries that want to push ahead with green reform and should be encouraged and supported in developing their national plans. Such an approach would include a strategy on youth and unemployment, and will also foresee an important role for the private sector. The Rio+20 declaration is a first start in this direction but needs countries with a strong commitment to the concept of a green economy.

2 Empirical Insights from Countries Around the World

Insights from quite a number of case studies can help to shed some light on the overall relevance of the green economy concept when governments of the world met at Rio 2012 to consider the current and future prospects of sustainable development discourse.

2.1 The Role of Strategy and Planning

Selected country examples highlight the importance of an overall strategic approach that outlines priorities and guides the further implementation process towards a green economy. *Qi Ye* and *Qin Cai* illustrated the relevance of China's Twelfth Five Year Plan (12th FYP) for the Chinese green economy approach and mentioned that some even referred to it as China's green development plan to outline the change in how the role of the environment is dealt with by the Chinese government. Not only was the 12th FYP considered ambitious and a priority topic, low-carbon development was located right next to growth of gross domestic product as a top priority in Chinese economic policy. It remains to be seen how successful this co-existence will be. But, as the authors outline, based on the most recent positive experiences with the 11th FYP, cautious optimism seems to be appropriate.

For the case of Ethiopia, *Yacob Mulugetta* describes the country's innovative approach of establishing twin strategies, with its Growth and Transformation Plan running alongside the Climate Resilient Green Economy strategy. The approach is considered as ambitious as it is audacious. The strategy proposes to enhance the quality of ecological services in the course of pursuing growth and massive poverty reduction efforts, which causes some scepticism regarding the

implementation prospects without externalising the negative costs of development. However, as *Yacob Mulugetta* also points out, the ideas around the green economy are not new elements in Ethiopian development discourse. He refers to the longstanding recognition among Ethiopian policy-makers that unless the country is able to modernise its agriculture, develop its infrastructure and create viable industries, it will continue to struggle to meet the basic needs of its population. Seen in this light, the green economy approach seems to meet current policy demands and, hence, offers a window of opportunity to induce change. More generally, as outlined by *Johanna Klein* and *Stefanie Reiher* for the African context, the development and implementation of green economy policies and frameworks is significantly hindered by the fact that data on environmental statistics and the impacts of economic policy on environmental degradation is generally insufficient. Accordingly, there is a certain risk of ill-informed policy choices when operationalizing green economy concepts for specific country contexts. South Korea and Mexico are further vivid examples of powerful strategies established with far-reaching implementation schemes — in these cases with a strong climate change focus (see below).

2.2 The Role of Creating an Inclusive and Participatory Process

A lasting change management process towards a green economy requires the close interaction of key stakeholders in the countries. This is relevant for the establishment of the overall discourse, but also when defining and formulating the framework to implement priorities towards a green economy. The example of Brazil by *Aron Belinky* and *Gustavo Ferroni* is instructive in this regard. While a part of Brazilian society, government and the private sector have been pushing the discourse, there have also been sceptical players in social movements and in other sectors of society. This scepticism relates especially to the broad green economy concept, which has been criticised as a way to commoditise life and common goods, or as a strategy to hamper emerging countries' development. The concept has even been seen as a public relations scheme or mere greenwashing.

Aron Belinky and *Gustavo Ferroni* also show that it is not only the transition towards a new model inspired by a green economy discourse, but also the management of the model itself that must be supported by a new inclusive and participative social governance. In other words, civil society must have a more active role in decision-making and rulings that have collective impacts. As *Johanna*

Klein and *Stefanie Reiher* stressed in the African context, greener economies are not automatically more inclusive and they do not per se offer economic opportunities for the poor. Trade-offs will occur and careful decision-making is required to design the green economy in a truly inclusive way and make the most out of the potentials described.

Some insights about the potential role of employment are offered in *Belynda Petrie*'s analysis of the South African case. As part of the country's Green Economy Summit in 2010, key elements of the concept for the country were identified. This was to start a national consensus building process on the Green Economy Path to be designed. As a result, this New Growth Path endorsed by the government finally included the objective of generating 400,000 jobs by 2020. This job creation was based on the expansion of existing public employment schemes for environmental protection, biofuels production and increased deployment of renewable energy. As Petrie describes, this approach provides a unique opportunity to create a considerable amount of jobs through partnerships among government, business representatives, trade unions and the community constituency, and was important to define an inclusive process.

To actually implement such a process, the role of civil society in the countries is of utmost importance. As *Euston Quah*, *Helena Varkkey* and *Jun Yi Ong* found for the case of Singapore, civil society movements can serve as crucial drivers for a more permanent shift in attitudes of the government and residents towards environmentalism. To this end, civil society groups can take a main role in public education, for instance, via campaigns targeted at all levels of society with a focus on the role of nature conservation, natural history, and environmental ethics. For a paradigm shift, even if not as realistic as outlined in the first part of this volume, lasting attitudes must shift towards a green social paradigm. However, as the authors also admit, substantial cooperation between civil society and government towards the green economy goal, as is the case in Singapore, facilitates the process considerably.

2.3 The Dominance of the Climate Discourse

A number of country cases clearly indicate how important the climate change agenda has been for discussion on greening the economy. This is surprising since the international climate change negotiations offer enough means to design and implement transformative space in key sectors of the economy. It is equally surprising because there were legitimate doubts about the problem-solving poten-

tial of this process, especially in the immediate aftermath of the conference in Copenhagen in 2009. Some of the cases seem to allow the conclusion that the guiding potential of the international climate change discourse for key economic structures in a country has not been sufficient to enable a strategic process relevant for the economy. In other words, the transformation of economies calls for a specific, targeted process in relevant sectors and the green economy concept has been serving as a bridge to reconcile both fields.

For Kazakhstan, *Petra Opitz* and *Bulat Yessekin* assert that climate change was a key driving force, along with environmental protection and reducing economic dependency on resource exploitation, for dealing with the green economy concept. As they emphasised, this discussion also helped to compensate for the country's late entry into international climate change discourse and the structural options under the Kyoto Protocol. Accordingly, the country was not able to use the Kyoto flexible mechanisms, but decided as a result of the green economy debate to introduce a greenhouse gas emission trading scheme for its major emitters in order to push its industry towards low-carbon modernisation. In South Korea, climate change mitigation form the core of the National Green Growth Strategy and Five-Year Plan announced already in 2009, as *Myung-Kyoon Lee* and *Jae Eun Ahn* point out. Sustained support for the green growth approach is required to achieve the climate change goals and targets. But with the target management scheme for greenhouse gas emissions and energy consumption introduced in 2010, an important framework was established. The scheme is to ensure reductions by significant emitters and it indicates that targeting greenhouse gas reduction is also accompanied by implementation means in the country. Based on 2012 legislation, the South Korean emission trading system came into effect in January 2015, covering about 66 percent of the country's total emissions.

The situation is similar in Mexico, as *Andrés Flores Montalvo* reveals. There are already several examples of policy and technology options for a green economy related to climate change mitigation where progress can be reported. With a number of measures to achieve the 2020 national mitigation target, implementation is quite well advanced. When some sectors of the economy like the financial sector show a certain resistance to move away from a business-as-usual pathway, part of the reason is that the benefits of supporting a transition to green growth are likely to not yet be perceived. *Sergey Bobylev* stresses that for Russia, the adoption of the Climate Doctrine in 2009 by the government was an important decision for transition to the green economy. The Doctrine outlines a com-

prehensive energy efficiency agenda in all sectors of the economy, addressing in particular industrial and infrastructure facilities as well as the transportation and building sectors. This is also interesting against the background that Russia at the same time was perceived as a main laggard in the international climate negotiations.

2.4 The Search for Long-Term Survival of Growth

In a number of resource-rich or resource-dependent economies, governments have shown an increasing awareness that the green economy discussion can help to preserve a growth of the economy in the medium to long-term. *Petra Opitz* and *Bulat Yessekin* highlight the notion in Kazakhstan that export products that do not meet advanced ecological standards will face increasingly difficult market prospects in the 'greener' states of Europe, North America and East Asia. The inefficient use of energy represents a waste of finite resources that could be more profitably sold on world markets. Domestically, overexploitation of natural resources such as soil and water can seriously jeopardise the future potential for overall growth. Low diversification of the economy makes Kazakhstan very dependent on volatile commodity prices. As a result, Kazakhstan was among the first natural resource-rich countries outside the European Union that have decided to focus on a green economy development path. This decision was highly influenced by environmental problems but also the insight that future growth depends on a diversified economy.

Similarly, *Sergey Bobylev* outlines for Russia the struggle to support the main pillars of the current Russian economy by considering the limited lifetime of such an approach. Accordingly, "the major task for the Russian economy at present is to shift from a resource-based to a more diversified economic structure". He refers to the important feature of becoming an ecological donor as part of the Russian position on Rio+20. However, the political economy of the country requires a prolonged period of governmental leadership in Russia taking a catalytic, regulatory, and even coercive role to improve energy efficiency. The gross increase in energy production is supported by many lobbies in the oil, gas and nuclear industries. In contrast, energy efficiency has no real support groups in businesses, government or society. The Russian government's awareness that the current export-oriented resource-based direction of economic development entails significant risks is only a first step. Putting the enhancement of energy efficiency at the heart of the Russian green economy approach is certainly an

important next one. A growing dependence on the natural-resource market entails the significant risks of a loss of competitiveness, the depletion and degradation of natural wealth, and an increase of environmental pollution. Nevertheless, Russia and the South African example, among others, underline that governments will not switch support away from energy-intensive industries as part of their transformation processes. Significant incentives for investment remain in parallel to green approaches, once more illustrating how challenging the transition process towards a green economy will be even, if the economic case seems to be obvious.

2.5 The Role of Governmental Leadership

Before greening of the economy became a major topic in international and national debates, it had played quite a different role in the case studies examined in this volume. For some countries, Singapore being one example, the establishment of a green economy can be based on strong support from civil society. Brazil serves as another example for the influential role of a civil society that supports an overall critical discourse about the direction and priorities of the transformative process of greening the economy. The case studies examined in this volume hardly give any evidence of the private sector playing a major role in putting the need for transformation on the agenda. There is no doubt that such a process will not be implementable without the inclusion of stakeholders from the private sector in a sustainable value chain creation. However, the lion's share of cases suggest that a strong and lasting role of the government is required to establish a strategic cross-sectoral process and the overall implementation structure towards a green economy. Countries with established multi-year planning processes such as China or South Korea are likely to make it easy for the governments to show the kind of leadership needed. But China is a good example of how important the further process of engaging the subnational level is. South Korea can serve as an example for how vital it is to translate the leadership into an institutional framework. To realise the vision of low-carbon green growth, Korea successfully put the necessary institutional framework in place. But, as *Myung-Kyoon Lee* and *Jae Eun Ahn* outlined, a sustained level of support for green growth from the political leadership is needed to draw the right conclusion from first results from implementation.

According to *Belynda Petrie*, attaining the desired paradigm shift necessitates the type of central leadership that shows insight into the numerous social, eco-

nomic, environmental and political contexts and impacts. She outlines that a green economy approach has to emerge amongst the top of the government's numerous priorities. South Africa as well as Mexico are examples where hosting the United Nations Climate Change Conference in 2011 and 2010 respectively has correlated quite impressively with political leadership initiatives. A key question is: how enduring is such a leadership approach, especially in times of economic crisis? Strategies and plans with a strong monitoring and evaluation system can help enable a continuous review. This is especially challenging when complex methodological questions are arising, such as on identifying the social benefits of a green transformation process.

Last but not least, highly resource-dependent countries — seen in this volume in the examples of Russia and Kazakhstan — face particular challenges in terms of showing leadership. A society that is used to benefitting from the exploitation of resources is likely to need a continuous discourse about the overall goals and means of transformation, and a clear vision of how the renewed social contract of a green benefit will be realised. The discussion of conceptual requirements and empirical examples gives some grounds for careful optimism that green economy will be more than a buzzword with a limited lifetime.

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