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For Kind Attention:

Ms Phumla Nyamza

Committee Secretary

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Dear Sister Phumla

Please be so kind as to bring the following to the attention of the committee on the impacts of climate change. I am unfortunately unable to attend, as I shall be out of the country.

Dear Committee members.

Thank you for making an opportunity for civil society to make input on this important matter.

Much research has been carried out with regard to Climate Change, but little, if any, on the systemic issues that create this problem – we need to be clear that Climate Change is a symptom, not a problem in itself.

Recent research confirms:

51% of all greenhouse gases come from meat production

Over 40% of American greenhouse gases come from products and processes

Given the above, and the dire need for decent and safe work for our people, we can do no better than submit the attached documents

1) **Green Jobs in a Green Growth Economy**

2) **Greening Growth – Towards a Green Economy, Rich with Green Jobs**

which will prove to be a robust way forward in building a sustainable economy, as well as place South Africa in the forefront of the world with regard to finding an alternative to the current dysfunctional economic system, which continues to harm our people, so much so, that we now have the largest gap between rich and poor in the world.

We think the time for business as usual has passed – it is time to take up proven approaches that deliver to more than just an elite. We are sure you are all in agreement with this.

Kind regards

A stylized, handwritten signature in black ink, consisting of several overlapping loops and lines.

M. Lakhani

National Co-ordinator - IZWA

**Greening Growth –
Towards a Green Economy,
Rich with Green Jobs**



A non-paper

Introduction and Context:

What on Earth is going on? To provide some background and context to this document, it was felt that an indication of the trends in the field would be of use. Some indicators have been chosen from news from around the world...

Sub-Saharan Africa:

“Sub-Saharan Africa could provide more than 170 gigawatts of additional power-generation capacity - more than double the region's current installations - through 3,200 "low-carbon" energy projects Together these projects could avoid some 740 million tons of carbon dioxide-equivalent reductions each year. The total capital costs are estimated to be at least \$157 billion, the report said. "The pipeline of similar projects in other regions shows us that such projects are often economically viable when carbon revenues are added," said World Bank senior energy specialist Massamba Thioye, who co-authored the report, in a [statement](#).”

Global:

The global market for environmental products and services is projected to double from the current \$1.37 trillion per year to \$2.74 trillion by 2020, according to a 2008 report co-sponsored by the UN Environment Programme and several international labor organizations.

“Think 1.8 million jobs in the environmental sector with 8% of GDP accounting for Green technologies... jobs in the renewable energy sector increased from 94 000 (2000) to 278 000 (2008). The world trade volume in environmental goods has increased by an average of 9.5% a year since the early 1990's. The estimated worldwide turnover by 2020 is EURO2.8 trillion, and Germany expects to double it's jobs in the environmental sector to 3 million by 2020.” M&G

EU:

“Jobs in low-carbon sectors are already outstripping those in Europe's traditional polluting industries in Europe, but the EU is missing the boat as regards harnessing the economic crisis to kick-start the transition to a low-carbon, competitive economy, a WWF study published yesterday (16 June 2009) shows. The conservation NGO's estimates show that renewable energy, green transport and energy-efficient goods and services employ at least 3.4 million people in Europe. This compares favourably with 2.8 million jobs in mining, electricity, gas, cement, iron, steel and other polluting industries, it reads. Renewable energies employ 400,000 people, but the potential for growth is significant, the study points out. Although around 70% of renewables technology rests in the hands of European companies, only a small number of countries, with Germany and Spain in the lead, account for the bulk of jobs in Europe. The largest share of green jobs, around 2.1 million, is in sustainable transport. “

United Kingdom:

“Green jobs are growing more than twice as fast as other employment, according to [a report](#) released today by the Pew Charitable Trusts. Driving the expansion is consumer demand, venture capital and federal and state policy reforms, said Pew in a release. "A clean energy economy," said Pew, "generates jobs, businesses and investments while expanding clean energy production, increasing energy efficiency, reducing greenhouse gas emissions, waste and pollution, and conserving water and other natural resources." June 10, 2009

The green-collar sector is a huge growth industry. Worldwide, businesses invested \$117.2 billion in alternative energy in 2007, according to New Energy Finance, a U.K. research company. Over 3,400 U.S. companies are in the solar energy business, including manufacturers, installers, distributors, developers and suppliers.

“The pursuit of so-called "green jobs"-employment that contributes to protecting the environment and reducing humanity's carbon footprint-will be a key economic driver of the 21st century. "Climate-proofing" the global economy will involve large-scale investments in new technologies, equipment, buildings, and infrastructure, which will provide a major stimulus for much-needed new employment and an opportunity for retaining and transforming existing jobs.

The number of green jobs is on the rise.

The renewable energy sector has seen rapid expansion in recent years, with current employment in renewables and supplier industries estimated at a conservative 2.3 million worldwide. The wind power industry employs some 300,000 people, the solar photovoltaics (PV) sector an estimated 170,000, and the solar thermal industry more than 600,000. More than 1 million jobs are found in the biofuels industry growing and processing a variety of feedstocks into ethanol and biodiesel. Construction jobs can be greened by ensuring that new buildings meet high performance standards. And retrofitting existing buildings to make them more energy-efficient has huge job potential for construction workers, architects, energy auditors, engineers, and others. The weatherization of some 200,000 apartments in Germany created 25,000 new jobs and helped retain 116,000 existing jobs in 2002-04. The transportation industry is a cornerstone of modern economies, but it also has the fastest-rising carbon emissions of any sector. Relatively green auto manufacturing jobs- those in manufacturing the most-efficient cars currently available-today number no more than about 250,000 out of roughly 8 million in the auto sector worldwide.” Worldwatch: Green Jobs: working for people and the environment

Global Roundup:

The global market volume for environmental products and services currently runs to about \$1,370 billion (€1,000 billion), according to German-based Roland Berger Strategy Consultants, with a projected \$2,740 billion (€2,200 billion) by 2020.

Globally, some 300,000 workers are employed in wind power and perhaps 170,000 in solar photovoltaics (PV). More than 600,000 people are employed in the solar thermal sector—by far most of them in China. Almost 1.2 million workers are estimated to be employed in generating biomass-

derived energy (mostly biofuels) in just four leading countries: Brazil, the United States, Germany, and China. Overall, the number of people presently employed in the renewable energy sector runs to about 2.3 million. Given the gaps in employment information, this is no doubt a conservative figure.

The most impressive building project to date is the German Alliance for Work and the Environment, a retrofitting program serving 342,000 apartments as of March 2006. From 2001–2004, this project was responsible for creating 25,000 jobs and saving an existing 116,000. In 2006, an estimated 145,000 additional FTE (full-time equivalent) jobs were attributed to this building retrofit program as a result of increased levels of public-private spending. Additionally, many studies have begun to assess the number of potential jobs that would be created through energy-efficiency measures including investment, standards, and mandates. China, which has the largest amount of waste, has a mix of formal and informal collectors. About 1.3 million people are employed in the formal waste collection system and an additional 2.5 million informal workers or scrap collectors. But beyond waste and scrap collection activities, China has a far larger number of people involved in all aspects of recycling, reuse, and remanufacturing—as many as 10 million according to one estimate. In Cairo, there are an estimated 70,000 or so Zabaleen—independent garbage pickers and recyclers—in addition to formal-sector garbage-collecting companies that are far less focused on recycling than on waste disposal.



Already 800 million people are engaged in growing food in urban areas. The employment benefits of sustainable urban agriculture are potentially enormous.

Source: Green Jobs: Towards decent work in a sustainable, low-carbon world

Summary:

There are probably as many paths to a Green Economy as there are people, but one way in which this may be achieved, many agree, is being followed by some UN projects. Some of the key issues reiterated time and again, include the following:

1. Promotion of Sustainable Consumption and Production (Demand-side Management)
2. Greening Business and Markets
3. Development of Sustainable Infrastructure
4. Green Tax and Budget Reform
5. Eco-efficiency Indicators

Sustainable Livelihoods Approach: The Social Link to Green Growth

It is often forgotten that a Green Economy is very people friendly, and delivers on more social mandates than almost any other approach – and not only will the Green South African economy continue this trend, it will also help us address various challenges, from Climate Change to the creation of Decent Jobs; from local food security to safe and clean energy sources; the re-integration of (for example) lost manufacturing jobs, greatly in demand in a Green Economy – the list could go on...

Many projects emphasize the Sustainable Livelihoods approach, a rights-based approach that recognizes the poor as a key stakeholder in the development process. To this end, Green Growth encourages the use of participatory assessments, designed to include the concerns of vulnerable women and men in the policy planning and implementation cycle. Adopting this approach allows Green Growth to work towards win-win solutions: addressing the environment in ways which enhance opportunities for the poor to participate more fully in society, improving their quality of life.



Greening growth: what are the basic principles?

- Quality of economic growth
- Eco-efficiency of economic growth
- Environmental sustainability vis-à-vis environmental performance

Key Interventions towards a Socially Just Green Economy:

1) Sustainable Consumption and Production – these patterns are basic drivers of any economy and play an important role in shaping the sustainability of economic growth. Developing regulatory frameworks, coupled with better pricing signals for raw materials, and penalising disposal or destruction of materials in a de-materialised economy (as required by our National Framework for Sustainable Development), can create the conditions for more sustainable processes.

Clean and eco-effective production is supported by

- (i) green investment;
- (ii) eco-innovation;
- (iii) eco – design;
- (iv) ambitious and regularly updated product standards and labelling programmes;
- (v) increasing market access for environmental goods and services;
- (vi) environmentally sound public procurement rules and practices;
- (vii) environment management systems and standards.

2) Greening Business and Markets

This requires initiatives from both the private sector and policy makers. Sustainability is an essential component of the long term business objectives of private sector firms, both by the promotion of eco-

efficient production activities and by marketing sustainable products and services. Social entrepreneurship targets poor communities in the local economy to nurture green business solutions for poverty reduction and sustainable livelihoods.

Corporate responsibility and accountability, including

- (i) by creating full transparency about the sustainability performance of business;
- (ii) dialogue between enterprises and the communities in which they operate;
- (iii) financial institutions to incorporate sustainable development considerations into their decisionmaking processes;
- (iv) workplace-based partnerships and programmes
- (v) review and regulation of advertising in order to prevent unsubstantiated and/or misleading environmental claims.

3) Sustainable Infrastructure

Many countries are locked into unsustainable resource consumption patterns, due in large part to the way infrastructure has been designed to deliver services. The development of an eco-efficient infrastructure – economically efficient, environmentally sustainable systems that provide citizens with safe and reliable access to shelter, energy, transportation, water, proper sanitation and re-integration of wastes back into the economy – is becoming increasingly critical.

4) Green Tax and Budget Reform

While SA has begun this process, this policy instrument comprises a wide spectrum of fiscal pricing measures that have the potential to simultaneously increase revenue and foster Green Growth. More specifically, it entails: 1) shifting the tax burden from traditional areas of taxation, such as income savings and capital gains, to environmentally relevant products and activities like fossil fuels and waste, both of which are highly subsidised, often by the impacts on the poor and marginalised; and 2) redirecting subsidies from environmentally perverse activities, towards activities that promote Green Growth. This reform is done with the aim of achieving revenue neutrality: a net zero increase in the level of taxation on the economy.

Ecological fiscal reform containing

- (i) removal of environmentally harmful and other perverse subsidies;
- (ii) use of eco-taxes to internalise external costs;
- (iii) broader use of price mechanisms that support policy integration;
- (iv) selective use of positive incentives;
- (v) development of new and common measures of accounting including environmental impacts within the current system of accounts.

5) Eco-efficiency Indicators

Eco-efficiency, or minimizing environmental pressure while maximizing economic benefit, is a key sustainability principle. A country's economy can be thought of as a huge resource-processing plant.

Raw materials, including energy and water, go into the economy as inputs to various production or consumption processes. At the other end, the result is goods, services and waste. The transformation process is intended to result in some human benefit. Maximizing the efficiency of resource use and minimizing pollution during the entire transformation process across economic sectors is critical to achieving sustainable development or economic benefit.

In 2000, the World Resources Institute undertook a study of material flows across five economies, tracing the inputs of raw materials (minerals, other raw materials and energy) to determine the amounts that were used to create durable material wealth (material in manufactured goods and infrastructure that would exist for more than a few years) and the amounts that ended up as waste. It was found that certain economies seemed more predisposed than others to create higher proportions of waste. In one case, for every unit of material wealth created, three times the amount of waste was created. In others, the ratio was closer to 1 to 1.2

Chinese reduction plans by 2020:

(Compared to 2000 levels):

Energy intensity (energy used per unit GDP) by 50 to 60 per cent

Water intensity (water used per unit of GDP) by 80 per cent

Sulphur dioxide (SO₂) intensity (SO₂ emissions per unit of GDP) by 75 per cent

Carbon dioxide (CO₂) intensity (CO₂ emissions per unit of GDP) by 60 per cent

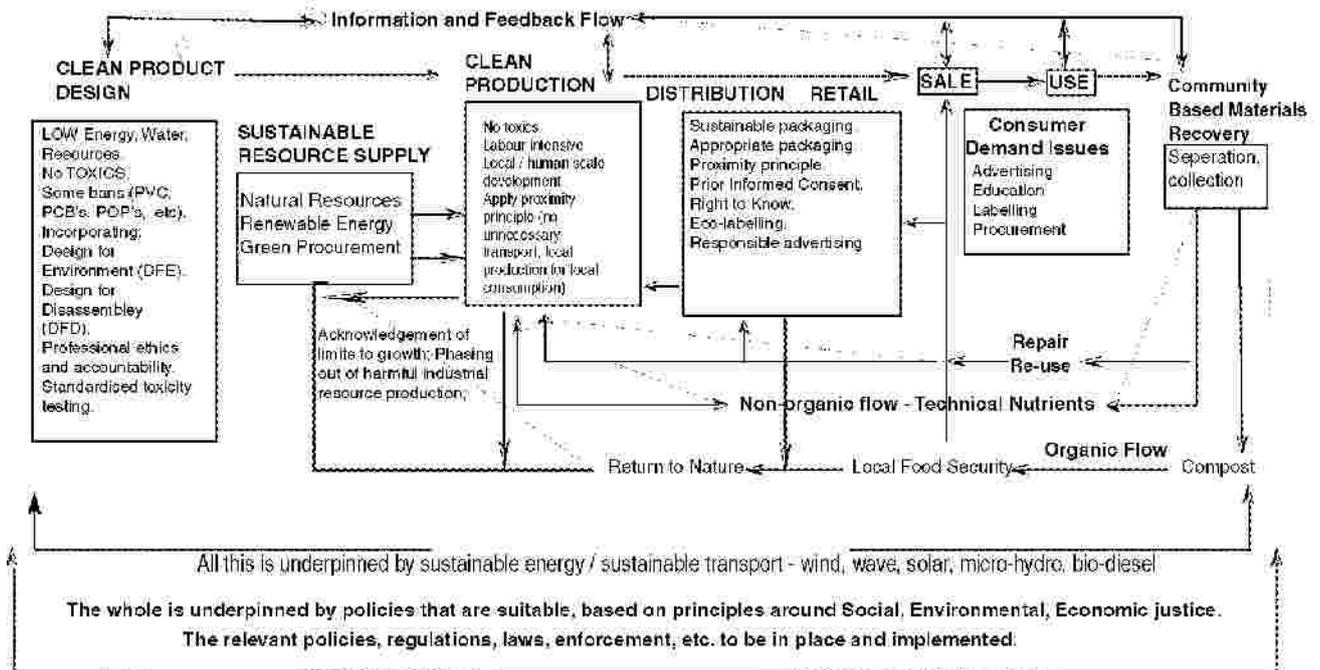
These plans take some key steps in defining eco-efficiency indicators that can be used to monitor trends in economic growth. It is also beginning to explore how such indicators can be applied to assess the environmental sustainability of infrastructure.

Some key questions addressed by these projects are described below:

- Ø How is eco-efficiency measured?
- Ø What indicators can countries use to measure eco-efficiency?
- Ø Is infrastructure becoming more or less eco-efficient?
- Ø Is infrastructure delivering more services per unit of environmental impact?
- Ø Does the fiscal system adequately facilitate improvement in the quality of consumption?
- Ø Are consumption patterns becoming more eco-efficient as incomes rise?
- Ø Are businesses actively engaging in practices that lead to more eco-efficient production and consumption?

SUSTAINABLE ECONOMY FLOW CHART

OVERARCHING REQUIREMENTS - Cradle to Cradle (Safe, low emissions / NO Toxic Emmissions / NO Toxic Discharges / NO Dilution)



All statements, boxes, and paths will be expanded upon in the relevant documentation. Thanks to Julie Dickinson (Zero Waste International Alliance) for inclusion of the Proximity Principle; Nicole Venter for Education; Rory Short for Ethics.
 c Muna Lakhani 2003 (ver3/06)
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Detail:

Through its focus on the greening of economic growth, international work recognizes that different patterns of economic growth lead to different outcomes for ecological integrity and therefore for human well-being. The idea that the “quality” of economic growth differs depending on policy choices, and that all countries - including developing countries - can choose their development path, must be a basic principle underlying the work done in greening economic growth. Quality of economic growth, in the context of sustainable development, may mean different things various countries and regions. In South Africa, as in Asia and the Pacific, overall, there has been a coincidence of rapidly expanding economies, poverty and substantial future consumption pressures, however, the natural resource base in Africa is wider than SE Asia. Thus, a focus on meeting human needs and improving well-being with the lowest possible ecological cost is more relevant in Asia and Pacific than in any other global region, but given the degradation and skewed land ownership patterns in South Africa, the same is relevant here.

Developing policies to promote and measure the eco-efficiency of economic growth is therefore a key way to meet the most important challenge to sustainable development in this region reducing the pressure on the natural resource base while continuing meet human needs. And how is eco-efficiency achieved in practice? There needs to be an emphasis on the difference between policies and institutions that work to improve environmental performance, and those that contribute in a meaningful way to improving environmental sustainability. A focus only on improving environmental performance (that is, the end result, and mainly pollution control) results in end-of-pipe solutions – this is the current approach in South Africa. At the same time, there is a need to take action to address the environmental sustainability of the economy where the biggest eco-efficiency gains can be achieved. The green growth approach provides the tools for this.

Many make the mistake of thinking that eco-efficiency has to do with birds and trees and bees and animals – however, eco-efficiency has massive potential positive impacts on human health, wealth and well-being. In short, sustainable and people-driven eco-efficiency translates into more benefit for more people, from fewer resources.

Reviews of progress on achieving the Millennium Development Goals justify a growing uneasiness with prevailing economic growth patterns, evidenced in the media and by some research. Of course, the recent and ongoing “financial meltdown” is impacting across the globe, and those economies that are most eco-efficient, tend to be the ones surviving the problem best, as they are able to provide for their needs at a local level. Only a few countries have managed to increase incomes at all levels of society. In most countries, the gap between rich and poor is growing, with South Africa unfortunately leading the pack (as measured by the GINI coefficient). However, income inequality is only part of the picture. Gender-based inequalities in access to health care and rural-urban inequalities in relation to access to water and sanitation are also highlighted by these reviews.

Despite economic growth since the advent of democracy, the results have not delivered substantial benefit to the poor and previously marginalised in the way it was originally hoped for.

One key reason is that the “growth at all costs” approach has come home to roost, as the famous “trickle down” theory and others, have confirmed that the growth only approach does not lead to significant improvement in the lives of the poor, and instead, has been responsible for the growth of the incomes of the rich.

The degradation of the natural resource base exacerbates the situation and makes it more difficult to advance towards achieving Goal 1 (eradicate extreme poverty and hunger) in a way that benefits all persons in society. There is continuing evidence of reduced natural capital in the form of declining air

quality in many cities across the region, land degradation and desertification, shrinking natural forest cover and increasing water stress. The limitations of and continuing threat to natural capital compromise the ability of Governments to meet the still substantial needs for economic benefit

Most importantly, current and projected patterns of consumption and production point to mounting future environmental pressures, pressures that not even the improvements in pollution control that sometimes accompany economic growth will be able to relieve.

“Grow now, clean up later”, is no longer an option. Improving the ecological quality of economic growth requires greater focus.

Fiscal policy and pricing is the “software” of our economies and societies. Are fiscal policy and pricing “programmed” for the kind of economic growth that maximizes human well-being and minimizes environmental impact, or do they promote economic growth at all costs? Do fiscal policy and pricing reward and facilitate investments made in natural capital commensurate with the ecosystem goods and services that this natural capital is expected to provide?

Are current patterns of infrastructure development locking countries into resource-intensive, socially excluding lifestyles for decades into the future, or is there sufficient effort to develop infrastructure in a way that maximizes service delivery and reduces environmental impact? Is consumption being promoted as a means to improve human well-being, or as an end in itself? How can sustainable consumption choices be created to meet the demand of the growing numbers of conscientious consumers? Are businesses able to transform their practices quickly enough to restore, rather than destroy, natural capital? How can barriers be removed to allow business to achieve this?

While there are some key ethical and moral issues attached to these questions, they serve to indicate (at the very least) the direction that the economy is or should be heading in.

Table 1: Environmental sustainability vis-à-vis environmental performance

	Environmental performance approaches	Environmental sustainability approaches
Planning and policy perspectives	Short- to medium-term perspectives	Long-term perspectives
Intervention in systems that impact on the natural environment	Focus on improvements to existing modalities of consumption and production and end-of-pipe solutions	Seek fundamental changes to patterns of socio-economic activity (consumption and production) to make them more eco-efficient Seek to improve decision-making processes that impact on the use of natural resources
Scope of responsibility	Mainly implemented by government agencies and private sector units responsible for environmental management	Require the involvement and support of all government agencies, the private sector and the wider society
Measures and indicators	Use traditional measures and indicators of environmental quality – e.g. extent of forest area, concentrations of pollutants	Seek to determine the impact of patterns of natural resource use by focusing on the linkages between the use of environmental goods and services and anthropogenic activity: for example, eco-efficiency of use of ecosystem goods and services (e.g. total material flows per unit of GDP, and pollution produced per unit of production)

Source: ESCAP (2006). *State of the Environment in Asia and the Pacific 2005* (New York, United Nations).

Can current economic and pricing systems (the software of the economy) and the physical expressions of economic growth manifested in the trade in goods and services as well as patterns of infrastructure development (the hardware of the economy) produce new environmental outcomes?

It is unlikely, even with the best pollution and waste control measures in the world.

Where economic growth is determined by market forces, and market forces do not take into account environmental costs, environmental protection is doomed. Climate change is the most prominent example of such market failure. Eco-tax reform (ETR) uses fiscal policy measures to steer economic burdens away from economically beneficial activities (such as employment) towards environmentally harmful activities (such as the generation of pollution). With this approach, decision-making at every level, by the individual in society up to the highest national Government forum, is steered towards minimizing the environmental impacts of growth.

Sustainable infrastructure development is a critical focus of green growth. While infrastructure expands, it locks economies into specific patterns of resource use (such as energy) for decades into the future. In South Africa, as in Asia and the Pacific, where there is rapid urbanization and significant shortfalls in almost every kind of infrastructure, investments in infrastructure may be turned into investments in environmental sustainability and an opportunity to build more sustainable economies.

Another aspect of the hardware of an economy is the production and consumption of goods and services. The rate at which these goods and services are produced, and how they use environmental resources and services (as raw materials in their production, as inputs to their operation, or as waste sinks) are critical sources of environmental pressure. These pressures are growing with the rise of the consumer classes in many economies. The greening of business and sustainable consumption remain the core prerequisites for meeting both human welfare and environmental protection needs.

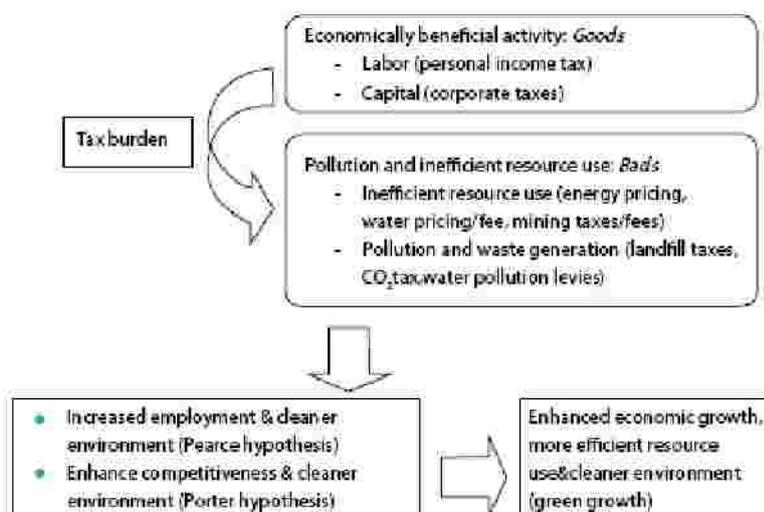
Eco-tax reform

ETR, also known as green tax and budget reform, is a powerful policy tool for building more effective, efficient, socially beneficial and environmentally sustainable fiscal systems and economies. Its key principles are the internalization of environmental costs in the market and revenue neutrality,

that is, green taxes should not pose an additional burden.

How can the promise of ETR be turned into a reality for more countries?

In his 2003, research paper, A. Verbruggen compared electricity prices and electricity intensities



(electricity used across each economy, per unit of GDP earned) and revealed a neat curve. At the top end of the curve lay the countries with high energy prices and low electricity use per unit of GDP (electricity intensity), typically high-income countries. At the low end of the curve lay the countries with very high electricity intensities and very low electricity prices. In the middle of this curve lay a few surprises: countries such as the United States of America showed higher electricity intensities than expected for their stage of development. Every unit of GDP earned by the United States of

America required twice as much electricity as those of countries such as Denmark and Sweden. The distribution represents the evidence that higher energy prices encouraged the development of energy-efficient economic structures without precipitating economic disaster. The economies of countries that had the highest energy prices were, in fact, among the most stable in the world. In addition, they were known for their achievements in socio-economic development, as measured by the human development index.

Energy pricing that steers the consumer towards more efficient energy use patterns is a standard instrument in environmental tax reform. When environmental taxes are applied in a revenue-neutral approach to ETR, they become a powerful tool in changing the sustainability of the local economy. Differential pricing is a mechanism that has been utilised in South Africa, but the bulk users have been paying the low prices, with small users paying more – the model of a stepped tariff will address these issues, as well as ensure that the social upliftment is further supported in this way.

Sustainable infrastructure

Green building design can reduce energy and water use by human settlements by more than 30 per cent over the lifetime of the structure; this does not take into account the potential savings from applying eco-efficiency concepts to all types of infrastructure development. The resulting savings in building operation and infrastructure development costs can help a nation's products and services become more cost-competitive in the global marketplace.

Infrastructure development – “hard-wiring” consumption patterns.

Infrastructure development patterns are the most important, but least recognized, determinants of the consumption patterns of a country. As cities grow upwards and outwards, highways lengthen and water, energy and sanitation services are expanded to people who do not yet have the basic requirements for a good quality of life, the region's growing populations are locked into energy and water consumption patterns determined by the infrastructure through which these services are delivered.

The spectres of climate change and growing resource scarcity suggest that policymakers and planners who are now accountable for only the capital costs of a building, a transportation system or a new urban centre when it is constructed should also be accountable for the social, resource-use, pollution and environmental costs over the lifetime of the infrastructure, far into the future.

Sustainable infrastructure development – eco-efficiency as a basic principle

Buildings are already responsible for about 75 per cent of GHG gas (mainly CO₂) emissions. Addressing this source is therefore important to climate change mitigation. Climate change adaptation entails improving energy and water efficiency in response to the projection of scarcity of these resources and the resulting impacts. Such impacts include the heat island effects, in which urban temperatures rise due to the thermal properties of the built infrastructure and energy use.

People transporting themselves (and needed materials) to the building can use more energy than the building itself does. Therefore, building location decisions are equally, if not more, important to sustainable infrastructure development than building design. There are tremendous opportunities to improve the performance of built environments in developing countries that are in the process of improving, renewing and extending their infrastructure.

Improving sustainability in infrastructure development requires explicit attention to eco-efficiency, achieving more with less consumption of resources (energy, water, land and raw materials) and production of pollution (such as CO₂, SO₂, nitrogen oxides) over both the construction and usage phases

of infrastructure. Concepts and tools such as material intensity per unit of service and material flow analysis can help determine resource consumption in the delivery of infrastructure services in order to measure eco-efficiency. These concepts help focus infrastructure decisions on eco-efficiency criteria and achieve the necessary paradigm shift in thinking and practice.

Sustainable infrastructure should:

- *minimize resource use and ecological impacts throughout the life cycle;*
- *preserve ecosystem integrity;*
- *not aggravate adverse global phenomena as climate change and ozone depletion;*
- *deliver economically viable goods and services;*
- *maximize long-run economic growth for the benefit of all;*
- *be financially viable;*
- *be managed and operated in a sustainable way;*
- *be socially inclusive;*
- *contribute to reducing poverty;*
- *contribute to meeting the MDGs;*
- *be appropriate for the stage of development and context; and*
- *be accepted and supported by the general population*

Source: Report of the ESCAP Expert Group Meeting on Sustainable Infrastructure Development In Asia and the Pacific, 11-13 June 2007, Bangkok, Thailand

Maximizing service delivery while minimizing environmental impact

This requires a closer look at whether infrastructure development objectives are expressed in terms of the problem that they are intended to solve (the lack of accessibility) or in terms of the solution that finds the greatest support in the most powerful sectors of society. Are the right questions being asked when infrastructure development decisions are made? For example: “How can we enable all or

most people to move to the places they need to get to in a timely way?” rather than “Is there enough space for the cars?”

A focus on sustainable infrastructure is therefore not only about reducing environmental impacts; it is equally about maximizing service delivery to all people in a way that enhances economic and social and economic performance. It is therefore more likely to result in infrastructure development patterns that are people-focused rather than narrow and solution-focused.

Infrastructure development in the ancient city of Bangalore, India has been described as typical of unsustainable infrastructure development, with road-widening and other infrastructure projects resulting in a city that is quickly losing its charm and marginalizing poor pedestrians and bicyclists.

Further along in its growth path, the city of Seoul has reversed this process to restore the Cheonggyecheon River by removing an overhead highway. Although the project cost as much as US\$386 million and resulted in social conflict and the displacement of businesses, it is creating an oasis in the city, which has had economic benefits for both small and large enterprises.

Forward-thinking planners are now proposing that accessibility, rather than mobility, needs to be the goal of transportation infrastructure. The dimensions of accessibility include:

Socio-economic accessibility: Are infrastructure solutions affordable for all or most groups?

Socio-cultural accessibility: Are mobility solutions provided in a culturally appropriate way?

Can all persons of various socio-cultural backgrounds (differentiated, for example by gender) equally access the services? Do the solutions reflect prevailing lifestyles?

Institutional accessibility: Are the solutions geared towards facilitating access to key institutions in society (for example government offices, schools, hospitals)?

Physical accessibility : Are mobility solutions accessible to those with physical limitation, for example?

Decentralized service delivery: economic, environmental and social benefits

Approaching infrastructure development from an accessibility-first perspective provides opportunities for socially inclusive infrastructure development, non-State involvement in service delivery and thereby broader-based economic growth that meets needs more efficiently.

Communities can themselves become investors in infrastructure development.

Decentralized infrastructure-service delivery, through, for example, through off-grid renewable energy services, small piped-water networks or local feeder bus systems is often promoted as a more environmentally sustainable and socially empowering approach to infrastructure development. Social empowerment facilitates investments from multiple stakeholders and provides livelihood opportunities.

Other benefits include a reduced vulnerability to natural disasters. Mr. David Ness further points out that low technology infrastructure solutions at a local community level, such as the three-wheeled

electric vehicles in Kathmandu or solar PV applications in rural areas, present the opportunity for the use of business models that couple increased eco-efficiency with economic and social benefits. For example, solar PV systems may be provided as part of a service by the producer (that is, rental rather than sale) and designed for end-of-life take-back, disassembly, reuse and recycling (creating greater product stewardship).

Another example of the multiple benefits of decentralized service provision can be found in the water sector. For developing countries in particular, the need to expand access to water and energy services in the most cost-effective and efficient way has become urgent. The work of ESCAP in Sri Lanka has shown

the potential pro-poor public-private partnership (5-P) models have to (a) expand access to water services, (b) reduce unaccounted for water and (c) be adapted to specific socio cultural and socio-economic situations.

Under this 5-P project, private companies, in partnership with state utilities, provide underserved markets with water, overcoming both the lack of resources faced by public utilities, and the socio-economic and socio cultural barriers (such as secure land tenure or proof of ownership) faced by poor or otherwise marginalized water users in accessing services from more centralized services. In the energy sector, another ESCAP 5-P project in Indonesia has forged a business partnership between a rural community and a hydropower company. The partnership includes sharing the income from the sales of electricity to the national grid, as well as increased access to electricity for the rural community.

The project is being replicated in other countries.

The examples above underline the principle that, in any service delivery system, physical infrastructure is complemented, strengthened and supported when users can be active investors. There is a definite need for social, fiscal and other policies that support entrepreneurs who invest in improving their environmental performance and who cover underserved and often unprofitable areas.

Such policy changes must approach infrastructure development in the context of the wider economy in society. Institutional and legislative support is needed to develop and maximize the synergies between infrastructure development and economic and social systems, particularly in the case of decentralized models of infrastructure development. For example, the Asian Development Bank notes that, to maximize the performance of small piped-water networks, small network service providers should be legalized.

Participants at the 2007 Expert Group Meeting on Sustainable Infrastructure Development in Asia and the Pacific argued that the decentralization of responsibilities without a corresponding decentralization of authority and resources could be “counterproductive and dangerous”.

Decentralising service provision, they said, did not eliminate the need for central oversight with respect to performance, safety and access standards, and coordination and planning.

Sustainable infrastructure and water-resources management

A combination of engineered and natural water capture, storage and treatment systems, may prove more cost-effective, less energy intensive and more socially acceptable than the engineered water supply systems that have become the norm in the western world.

Urban development planning that explicitly takes into account the possibility of water capture can go a long way towards facilitating water recycling. In the context of climate change, where the variability of rainfall is expected to increase, flood mitigation (for example through rainwater harvesting in urban centres) becomes an important infrastructure function. Rainwater harvesting for certain new buildings is now law in the Republic of Korea and in Bangalore, India.

Siting wastewater treatment plants close to the sources of both the water to be recycled and the water to be used increases the economic feasibility of water recycling. Urban stormwater run-off and treated wastewater irrigates public greenery and supplies horticultural and agricultural enterprises in Australia.

In the country's dry city of Adelaide, 19 per cent of water demand is met by recycled water.

The greening of business : changing growth paradigms

We are fortunate that environmentally sustainable business strategies and techniques translate into short- and long-term global business competitiveness. This is a very "convenient truth", a welcome antidote to the many "inconvenient truths" of the present unsustainability of business-as-usual practices that steadily erode the productive capacity of nations.

The sustainability race is one to the top that prevents rapid economic expansion from being a "race to the bottom". The social networks (that is, social capital) that facilitate sustainable business health are rapidly growing and are continually enhanced by public and private institutions such as the Grameen Bank, NGO partnership and sustainability-oriented public programmes. There has never been a better time for public policy managers to bring the magic of sustainable business prosperity to their stakeholders.

Business sustainability strategies becoming mainstream

Nearly all of the most successful businesses in every sector of the global marketplace have adopted sustainability strategies. While many, if not most, of these companies have a less than sound environmental or social history, the very fact that even theoretically unsustainable business sees the need for sustainability, should give us pause for reflection.

These companies demonstrate that sustainability is a successful marketplace strategy today, even with the many governmental policy and marketplace barriers that need to be addressed. However, it is clear that, so long as market prices do not reflect the full social and environmental costs of production and operations, sustainable products will face competitive challenges.

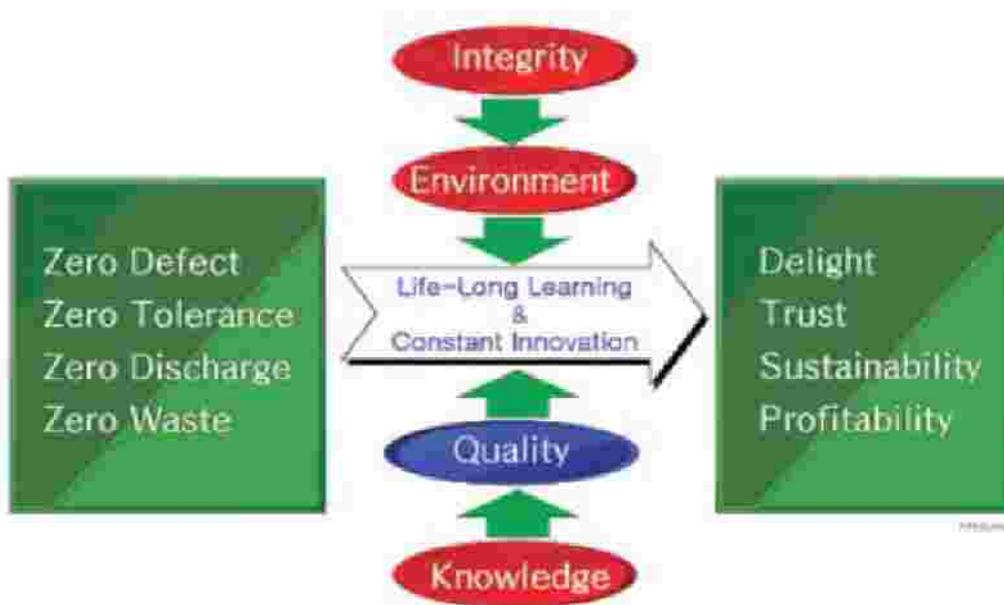
All organizations (for-profit businesses, non-profit enterprises and government operations) face similar challenges in implementing sustainability strategies. These challenges can be summarized as follows:

Integrating sustainability (long-term social and environmental responsibility) with revenue/profit goals and short-term financial challenges

Making “sustainability performance” everybody’s job

Allocating capital for both short-term (often “baby-step” and/or symbolic) successes and long-term sustainability performance investments

Figure 6: Sustainable business mechanism



Source: Yuhan-Kimberly, Republic of Korea, presentation at the ESCAP Third Green Growth Policy Dialogue: the Greening of Business and the Environment as a Business Opportunity, Bangkok, 5 to 7 June 2007.

Creating an organizational culture that embraces and reinforces sustainability values – usually within a socio-economic environment that has not done so

Convincing shareholders and other important stakeholders, including employees, that sustainability strategies are critical for the organization’s future and are based on sound scientific/economic assessments of the future rather than a passing fad

Expanding sustainability strategies beyond operations under the organization’s direct control to the entire value chain

Creating sustainability management systems that add more value than their costs of development and implementation (often including third-party auditors)

The role of Government

How can public policy leaders and implementing (regulatory) officials support enterprises, which are the engine of the region’s economy in overcoming these hurdles?

The first step is to fully understand and embrace sustainability strategies as a source of short-term and enduring competitiveness for enterprises, communities and nations. The second is to prioritize fiscal policy and financial innovations, education and other interventions that provide public support and real incentives for sustainable consumption (market stimulation). Third, fiscal policy and financial innovations must provide enterprises with direct support and incentives in making whole-system changes that increase the eco-efficiency of services or product delivery across the entire life cycle.

For example, tax breaks for process analysis and improvements should be more readily receivable than tax breaks for end-of-pipe pollution control. Fiscal policy must maximize incentives for sustainably designed products, including the elimination or reduction of research/development cost write-offs unless the costs are for a more sustainable product than what presently exists in the marketplace.

In developing countries in Asia and the Pacific, enterprises need substantial support in making such improvements, and fiscal policy must be supported through special programmes, such as those provided by cleaner production centres established by United Nations organizations in several countries.

A key strategy for Governments in greening businesses is to collaborate with both civil society and businesses, and, when possible, engage the entire society.

Corporate ratings disclosure programmes that use simplified ratings of pollution control efforts to publicize corporate environmental performance have successfully motivated enterprise-led improvements in several countries, and have increased public awareness of environmental protection issues.

Social entrepreneurship

In addition, public policy leaders can create favourable policy environments for social entrepreneurship, which is especially important in rural and impoverished communities. Social enterprises can fill the gap between private sector interests (often short-term interests) and Government programmes.

Social entrepreneurs are described by the Schwab Foundation for Social Entrepreneurship as combining the characteristics of successful businessman Richard Branson (of Virgin Group Ltd) with those of the legendary Catholic saint and charity worker Mother Teresa. The Foundation's website states that a social entrepreneur is "a pragmatic visionary who achieves large-scale, systemic and sustainable social change through a new invention, a different approach, a more rigorous application of known technologies or strategies, or a combination of these...with an emphasis on those who are marginalized or poor".

The greater competitiveness of a more sustainable business results from the strong execution of practices which include:

Resource productivity (i.e. efficiency)

- Energy and productivity
 - Energy productivity
 - Use of sustainable energy sources
- Water and other natural capital productivity
 - Water productivity and quality
 - Sustainable agriculture / silviculture
- Materials productivity
 - Zero waste
- Biomimicry-based design (including dematerialization)
 - Elimination of toxics
- Eco-industrial development and circular economy

Human productivity and culture

- Human health and safety (individual and family)
- Sustainable production and consumption training/education
- Equitable performance incentives (including enterprise ownership)

Corporate responsibility

- Transparency and ethics
- Sustainability-related capitalization
- Community respect and support
 - Restorative management (long-term building of natural and human capital)
 - Micro-enterprise or disadvantaged business support
- Enterprise-wide and Life-cycle (value-chain) management
 - Sustainable/Environmental management standards/systems
 - Life-cycle Management

Social entrepreneurship support strategies are centred on the fundamentals of the “ecosystem for wealth creation” articulated by social entrepreneur expert Mr. C.K. Prahalad as follows: A market-oriented ecosystem that adapts and evolves and can be resilient and flexible Education across all levels to foster responsible entrepreneurship Reduction in the inequities in contracts due to asymmetries in (a) access to information, (b) choice of partners, (c) ability to enforce contracts, and (d) social standing

Building governance capabilities among the poor, in particular self-help groups such as those fostered by Grameen Bank and similar microlending organizations

He notes that public policies for social entrepreneurship remained a fertile area for study and experimentation.

Conclusion:

The work to date confirms that a Green Economy, a Circular Economy (as described by the Chinese) has the potential to deliver on government's social mandate, while encouraging the movement of the economy towards a genuinely sustainable base.

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Green Jobs: Towards decent work in a sustainable, low-carbon world

Green Jobs in a Green Growth Economy



"People well versed in environmental topics, or productive in developing methods that lighten the environmental footprint, will be highly sought, key players in the development of the new economy—and well rewarded."

Mario Mettich, communications manager for environmental health and safety at Con Edison.

Context:

While this document is intended to be read in conjunction with “Greening Growth – Towards a Green Economy, Rich with Green Jobs”, it is still useful as a general resource, to show how broad and deep a range of jobs a genuinely green economy can deliver.

Defining Green Jobs

The latest assessment report by the Intergovernmental Panel on Climate Change (IPCC) and the widely-noted Stern Review on the Economics of Climate Change have lent new urgency to countering the challenge of global warming—a calamitous development in its own right and a phenomenon that further aggravates existing environmental challenges. There is now a virtual avalanche of reports by international agencies, governments, business, labor unions, environmental groups, and consultancies on the technical and economic implications of climate change as well as the consequences of mitigation and adaptation strategies. Many declaim a future of green jobs—but few present specifics. This is no accident. There are still huge gaps in our knowledge and available data, especially as they pertain to the developing world.

Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World assembles evidence—quantitative, anecdotal, and conceptual—for currently existing green jobs in key economic sectors (renewable energy, buildings and construction, transportation, basic industry, agriculture, and forestry) and presents estimates for future green employment. The pace of green job creation is likely to accelerate in the years ahead. A global transition to a low-carbon and sustainable economy can create large numbers of green jobs across many sectors of the economy, and indeed can become an engine of development. Current green job creation is taking place in both the rich countries and in some of the major developing economies. We define green jobs as work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution. From a broad conceptual perspective, employment will be affected in at least four ways as the economy is oriented toward greater sustainability:

? ? First, in some cases, additional jobs will be created—as in the manufacturing of pollution-control devices added to existing production equipment.

? ? Second, some employment will be substituted—as in shifting from fossil fuels to renewables, or from truck manufacturing to rail car manufacturing, or from landfilling and waste incineration to recycling.

? ? Third, certain jobs may be eliminated without direct replacement—as when packaging materials are discouraged or banned and their production is discontinued.

? ? Fourth, it would appear that many existing jobs (especially such as plumbers, electricians, metal workers, and construction workers) will simply be transformed and redefined as day-to-day skill sets, work methods, and profiles are greened.

Green jobs span a wide array of skills, educational backgrounds, and occupational profiles. This is especially true with regard to so-called indirect jobs—those in supplier industries. Even for new industries like wind and solar power, supply chains consist largely of very traditional industries. For instance, large amounts of steel are incorporated into a wind turbine tower.

Technological and systemic choices offer varying degrees of environmental benefit and different types of green employment. Pollution prevention has different implications than pollution control, as does climate mitigation compared with adaptation, efficient buildings vis-à-vis retrofits, or public transit versus fuel-

efficient automobiles. These choices suggest that there are “shades of green” in employment: some are more far-reaching and transformational than others.

Greater efficiency in the use of energy, water, and materials is a core objective.

The critical question is where to draw the line between efficient and inefficient practices. A low threshold will define a greater number of jobs as green, but may yield an illusion of progress. In light of the need to dramatically reduce humanity’s environmental footprint, the bar needs to be set high: best available technology and best practices internationally will need to be replicated and adopted as much as possible. And, given technological progress and the urgent need for improvement, the dividing line between efficient and inefficient must rise over time. Seen in this context, “green jobs” is a relative and highly dynamic concept. A successful strategy to green the economy involves environmental and social full-cost pricing of energy and materials inputs, in order to discourage unsustainable patterns of production and consumption. In general, such a strategy is diametrically opposite to one where companies compete on price, not quality; externalize social and environmental costs; and seek out the cheapest inputs of materials and labour.

A green economy is an economy that values nature and people and creates decent, well-paying jobs. Green jobs need to be decent work, i.e. good jobs which offer adequate wages, safe working conditions, job security, reasonable career prospects, and worker rights. People’s livelihoods and sense of dignity are bound up tightly with their jobs. A job that is exploitative, harmful, fails to pay a living wage, and thus condemns workers to a life of poverty can hardly be hailed as green. There are today millions of jobs in sectors that are nominally in support of environmental goals—such as the electronics recycling industry in Asia, or biofuel feedstock plantations in Latin America, for instance—but whose day-to-day reality is characterized by extremely poor practices, exposing workers to hazardous substances or denying them the freedom of association. As the move toward a low-carbon and more sustainable economy gathers momentum, growing numbers of green jobs will be created. Although winners are likely to far outnumber losers, some workers may be hurt in the economic restructuring toward sustainability.

Companies and regions that become leaders in green innovation, design, and technology development are more likely to retain and create new green jobs. But workers and communities dependent on mining, fossil fuels, and smokestack industries—or on companies that are slow to rise to the environmental challenge—will confront a substantial challenge to diversify their economies.

Public policy can and should seek to minimize disparities among putative winners and losers that arise in the transition to a green economy, and avoid these distinctions becoming permanent features.

Drivers

What are the key drivers of green employment? Green innovation helps businesses stay at the cutting edge, retaining existing jobs and creating new ones. While some companies have barely progressed past green sloganeering—or worse, “greenwashing”—a growing number have announced ambitious goals to reduce their carbon footprint or make their operations “carbon neutral.” The global market volume for environmental products and services currently runs to about \$1,370 billion (€1,000 billion), according to German-based Roland Berger Strategy Consultants, with a projected \$2,740 billion (€2,200 billion) by 2020. Forward-thinking government policies remain

indispensable. They are important for providing funding of green projects; overall goal- and standard-setting beyond the time horizons typical in the business world; providing infrastructure that private enterprises cannot or will not create; and creating and maintaining a level playing field for all actors. Key policies include:

? ? Subsidies. Phase out subsidies for environmentally harmful industries, and shift a portion or all of those funds to renewable energy, efficiency technologies, clean production methods, and public transit.

? ? Carbon Markets. Fix the current shortcomings inherent in carbon trading and Kyoto Protocol related innovations like the Clean Development Mechanism so that they can become reliable and adequate funding sources for green projects and employment.

? ? Tax Reform. Scale up eco-taxes, such as those adopted by a number of European countries, and replicate them as widely as possible. Eco-tax revenues can be used to lighten the tax burden falling on labour while discouraging polluting and carbon-intensive economic activities.

? ? Targets and Mandates. Ensure that regulatory tools are used to the fullest extent in the drive to develop greener technologies, products, and services—and thus green employment. This includes land-use policies, building codes, energy-efficiency standards (for appliances, vehicles, etc.), and targets for renewable energy production.

? ? Energy Alternatives. Adopt innovative policies to overcome barriers to renewable energy development, including feed-in laws that secure access to the electrical grid at guaranteed prices.

? ? Product Takeback. Adopt “extended producer responsibility” laws (requiring companies to take back products at the end of their useful life) for all types of products.

? ? Eco-Labeling. Adopt eco-labels for all consumer products to ensure that consumers have access to information needed for responsible purchasing decisions (and hence encouraging manufacturers to design and market more eco-friendly products).

? ? R&D Budgets. Reduce support for nuclear power and fossil fuels and provide greater funding for renewable energy and efficiency technologies.

? ? International Aid. Reorient the priorities of national and multilateral development assistance agencies as well as export credit agencies away from fossil fuels and large-scale hydropower projects toward greener alternatives.

Modern economies mobilize enormous quantities of fuels, metals, minerals, lumber, and agricultural raw materials. Although some changes have been made in past decades to reduce the world economy’s environmental impact, these gains are insufficient and may simply be overwhelmed by continued economic growth.

In view of the gathering environmental crisis, and especially the spectre of climate change, there is an urgent need to make economies far more sustainable and thus to re-examine the prevailing production and consumption model. Concepts such as dematerialization, remanufacturing, “zerowaste” closed-loop systems, durability, and replacing product purchases with efficient services (such as “performance contracting”) have

been discussed for some time and tested in some instances, but by and large have yet to be translated into reality.



Green Jobs identified for South Africa:

The various sectors of the DEA 5 year Strategy suggest that the following Green Jobs should be developed and increased as soon as possible, as they are identified growth areas in the local economy.

Waste Sector

Industrial design (low materials, low energy low water low toxics use)
Design for environment
Design for disassembly
Sustainable Materials Research
Materials production
Sustainable energy (organic waste biodigestion)
Green procurement expert
Design for proximity
Sustainable transport packaging
Sustainable consumer packaging
Eco-labelling experts
Responsible advertising
Sustainable materials use for advertising
Sustainability educators
Community based materials recovery and value adding experts
Community and business on-site organics management
Technical nutrient flow experts
Organic flow experts
Composting experts – windrow; vermi; anaerobic;
Compost packaging and marketing
Green chemists
Labour intensive product designer
Pollution monitoring
Pollution avoidance experts
Sustainable transport
Design for repair
Design for re-use
Design for recyclability

Value adding designer
Collectors and recyclers

Air Quality

Air Quality Field technicians
Statisticians
Climate and Air Quality Modelling technicians
Geographical Information System (GIS) operators
Educators and Community liason officers
Monitoring and enforcement officers
Licensing staff
Laboratory Staff
Renewable energy specialists
Inspectors
Natural air monitoring systems experts

Integrated Environmental Management

Specialists in related fields (heritage, water, botany/biodiversity etc)
Environmental Impact Assessment Practitioner
Strategic Impact Assessment Practitioner
Social Impact Assessment Practitioner
Government officials
Transport planners
Town and Regional Planners
Inspectors
Environmental Control Officers
Monitoring and enforcement staff
Life cycle analysts
Life Cycle Economic Analysts
Public participation specialists
Lawyers and legal staff
Engineers
Green Architects
Designers
Project Managers

Key Niche Markets:

Green Design and Production: Zero Waste Design

Green	Globetrotters:	Travel	and	Hospitality
Sustainability	Stewards:	Planning	and	Land Use
Complementary	Care:	Health	and	Medicine
Power	Pushers:	Energy	and	Renewables
Planet	Protectors:	Legal		Careers
Green	Geeks:	Information	Technology	(IT)
Eco	Educators:	Green		Learning
Better	Builders:	Design	and	Construction
Improving	Industry:	Corporate	Social	Responsibility

Organic Occupations: Food and Farming

Additional Key Markets:

Life Cycle Analysts
Full cost accountants

More Detailed Niche Markets:

ENERGY EFFICIENCY

ALTERNATIVE ENERGY

Wind

Geothermal

Solar

Ocean energy (wave, tidal race, tidal, OTEC, off shore wind)

Biodigesters

AIR QUALITY MONITORING

ALTERNATIVE FUELS

ALTERNATIVE/NATURAL BUILDING

GREEN BUILDING / REMODELING

GREEN AND COOL ROOFS

CERTIFICATION AUDITS

COMMUNITY GARDEN MANAGEMENT

CORPORATE GREEN/SUSTAINABLE MANAGEMENT

ECO-TOURISM

EMISSIONS MONITORING

ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL SCIENCE

ENVIRONMENTAL TECHNOLOGY

GREEN CLEANING

GREEN HEALTH CARE

GREEN JOB PLACEMENT

GREEN MARKETING, PR, FILM AND VIDEO

GREEN TECHNOLOGY INVESTMENT / FINANCIAL MANAGEMENT

GREEN TRAINING

GREEN TRANSPORTATION

GREEN URBAN INFRASTRUCTURE

GREEN, SUSTAINABLE AND ENVIRONMENTAL ENTREPRENEURSHIP

IRRIGATION MANAGEMENT

LIGHTING RETROFITS

ORGANIC AGRICULTURE

ORGANIC FOOD PROCESSING

PERMACULTURE, BIODYNAMIC FARMING

POLICY & ADVOCACY

REFURBISH COMPUTERS

STORM WATER MANAGEMENT

URBAN FORESTRY

WATER CONSERVATION

WEATHERIZATION

ZERO WASTE

Green Jobs !

Agricultural Inspector

Agriculture or forestry supervisors.

Architect

Architect (Environmental /Sustainable Design)

Asphalt Recycling

Attorney

Bicycle / Scooter Technicians

Bicycle Recycling

Bike based delivery services

Biodegradable Materials

Biodiesel manufacture from waste vegetable oils

Biologist (Conservation)

Bio-Mimicry Engineer/Biologist

Building Material Recycling

Building Operations Management

Car and truck mechanic jobs, production jobs, and gas-station jobs related to biodiesel

Car Manufacturing (Green)

Cardboard Recycling

Career Consultant

Certified Organic

Chemist

Chemist (Environmental)

Chief Sustainability Officer (Chief Environmental Officer/ Chief Green Officer)

Climate Risk Analyst

Climatologist/Environmental Meteorologist

Commercial/Industrial Designer

Community Affairs Manager

Complementary Health and Medical Care

Composting

Computer Recycling

Conservation Scientist

Construction (Energy Efficiency - Green Building)

Construction Manager

Consultants

Corporate Social Responsibility Professionals

Corporate Waste Compliance Coordinator

Database specialists.

Eco-Friendly Furniture Builder

Ecological Economist

Ecologist

Economists (Environmental)

Eco-Tourism Jobs

Educators (Ecological)

Efficient Heating

Electricians.

Electronics Recycling

Emissions Managers

Emissions testing

Energy Efficiency Builder

Energy Engineer

Energy Manager (Renewable)

Energy retrofits to increase energy efficiency and conservation
Engineer/Biologist (Renewable Fuels/ Bio-Mimicry)

Engineers (Environmental / Pollution Control)

Engineers and Developers (Sustainable Energy)

Entrepreneur (Green)

Environmental Consulting

Environmental Engineer

Environmental Engineer

Environmental Health and Safety (EHS) Technicians

Fair Trade

Farm, Ranch, and Agricultural Manager Specializing in Organic Production

Farmer

Fashion Designer (Green)

Financial analyst/adviser specializing in socially responsible investing

Financial Analyst/Adviser Specializing in Socially Responsible Investing

Food Scientist

Food Waste Recycling

Foot Massager

Fuel-Cell Entrepreneur

Fund-Raising Director

Furniture Builder (Eco-friendly)

Geothermal Cooling

Geothermal Heating

Geothermal Power

Glass Recycling

Green Business Manager

Green Car Manufacturing

Green Interior Designer

Green Landscape Architect

Green MBA and Entrepreneur

Green Roofing

Green Travel and Hospitality

Green Walls

Green waste composting on a large scale

Groundwater Recovery

Hauling and reuse of construction materials and debris (C&D)

Hazardous materials clean-up

Heating, air conditioning and refrigeration mechanic and installer

High School Ecologists

Hydrologist / Environmental scientist

Indigenous Plant Restoration

Industrial Designer (Sustainable)

Insulation

Interface Designer

Interior Designer/Building Operations Manager

iPod/ iPhone Doctors

IT Specialists (Green Software and Hardware Developers)

Lamp Recycling

Land preservation

Land Use Planner

Landscape Architect (Green)

Landscaping

Lawyer (Environmental)

Lobbyist
Management

Manufacturing jobs related to large scale production of appropriate technologies (i.e. solar

Marine Renewable Energy

Materials reuse

Mattress Recovery/Recycling

Monitoring

Natural Fiber Carpet

Natural/Non-Toxic Cleaners

Non-toxic household cleaning in residential and commercial buildings

Organic Farming Specialists

Organic Food and Farming Production Specialists

Organic Gardening

Organic/Low or No VOC Paint

Organization

Paper Recycling

Parks and open space expansion and maintenance

Peri-urban and urban agriculture

Pest Control Technician

Plastic Recycling

Pollution Control Engineer

Pollution Control Technician

Printing with non-toxic inks and dyes

Protection Technician

Public transit jobs related to driving, maintenance, and repair

Public/Private Alternative Energy Engineers

Reclaimed Building Materials

Reclaimed Cotton

Reclaimed Fibre

Reclaimed Stone

Reclaimed Wood

Recycled Coffee Grounds

Recycled Concrete

Recycled Glass

Recycled Plastic

Recycled Rubber

Recycler

Recycling

Recycling and reuse

Recycling Specialists

Refuse Processors (into value added products)

Renewable Energy Manager

Renewable Fuels Engineer/Biologist

Renewable Resource

Science Teacher

Scientific researchers.

Scientist (Environmental)

Scientist and Hydrologist

Senior Hydrologist

Senior Urban Planner

Siding

Small businesses producing products from recycled materials

Social responsibility officers.

Soil Recovery

Soil Recycling

Solar Heating

Solar Installation

Solar Lighting

Solar Power

Solar Water Heating

Solid and Liquid Hazardous Waste Recycling

Specialist/Scientist

Steel Recycling

Sustainability Analyst

Sustainability Coordinator

Sustainability Director

Sustainability Officer

Sustainability Specialists

Sustainability Systems Developer

Sustainable material Doors

Sustainable Wood

Sustainable-Design Architect

Tire Recycling

Toxicologist

Transportation supervisors and dispatchers.

Tree cutting and pruning

Urban and Regional Planner

Urban Gardeners

Urban Planner

Urban Replanners

Waste Disposal Manager

Waste Management

Waste Veg Oil Recycling

Wastewater Water Operator

Water Conservation

Water Recovery

Water retrofits to increase water efficiency and conservation

Whole home performance, including attic insulation, weatherization, etc.

Wildlife Biologist

Wind Construction Project Manager

Wind Energy Developers

Wind Energy Developers and Construction Professionals

Wind Power

Wind Turbine Fabricator

Wind-Energy Developer

Windows

Wood Recycling

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