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Programmes in support of transitioning South Africa to a green economy

Prepared by the DBSA in consultation with the Department of
Environmental Affairs and Economic Development Department
and the Industrial Development Corporation

2011

The programmes described herein are not intended to be an exhaustive or exclusive list of the potential green economy programmes. Detailed scoping and implementation plans were not intended to form part of this submission but could be part of the next phase of this process. The green economy was broadly defined in terms of programmes that link environmental imperatives with economic growth, thus job creation, localisation and manufacturing underpin the proposals contained herein. The detailed scoping of job potential is contained in the green jobs report being prepared by the IDC and the DBSA.

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Abbreviations

BRT	bus rapid transit
DBSA	Development Bank of Southern Africa
GEM	Green Economy Mechanism
IDC	Industrial Development Corporation
IRPTN	Integrated Rapid Public Transport Network
IPAP	Industrial Policy Action Plan
LED	light-emitting diode
PES	Payment for Ecosystem/Environmental Services
REDD	Reducing Emissions from Deforestation and Forest Degradation
REFIT	Renewable Energy Feed-In Tariff
SADC	Southern African Development Community
UNFCCC	United Nations Framework Convention on Climate Change
WC/WDM	water conservation and water demand management

Section A: Introduction

Background

Greening the South African economy represents a critical lever for bringing about the structural transformation needed for a more equitable and inclusive economy. Coordinated activity is required to achieve the envisaged economic shifts to transition the country to a low-carbon and greener economy, with the ultimate objective of a carbon-neutral economy by 2050.

The Green Economy Summit held in May 2010 identified the need for flagship programmes to demonstrate green economic activity. This was proposed as an initial step towards the development of a more integrated and comprehensive approach to the green economy, for adoption by the government. The Development Bank of Southern Africa (DBSA) was accordingly requested to identify green economy programmes and to develop a proposal to mobilise resources on a national basis to support the implementation of these programmes.

Existing policy documents, such as the New Growth Path, the Industrial Policy Action Plan (IPAP) 2, the Green Paper on a Climate Change Response Strategy, the Long-Term Mitigation Strategy, the Integrated Resource Plan 2010, the Medium-Term Strategic Framework and its associated Outcomes, and the deliberations of the Green Economy Summit, provided useful departure points for programmes aligned with the strategic intent of current government policy. In addition to these policy documents, the Department of Environmental Affairs issued a call for Expressions of Interest for green projects aligned with the main themes articulated at the Green Economy Summit. A cursory analysis of the responses to the Expressions of Interest indicates that South Africans are investing in technology development, community participation and enterprise development from large- to small-scale in the green economy. It is also apparent that interpretations of green economy programmes are broad, encompassing research and development, early stage and commercial investment and capacity building activities to support important industrial and infrastructure sectors, including energy, water, waste and sanitation, transport and human settlements.

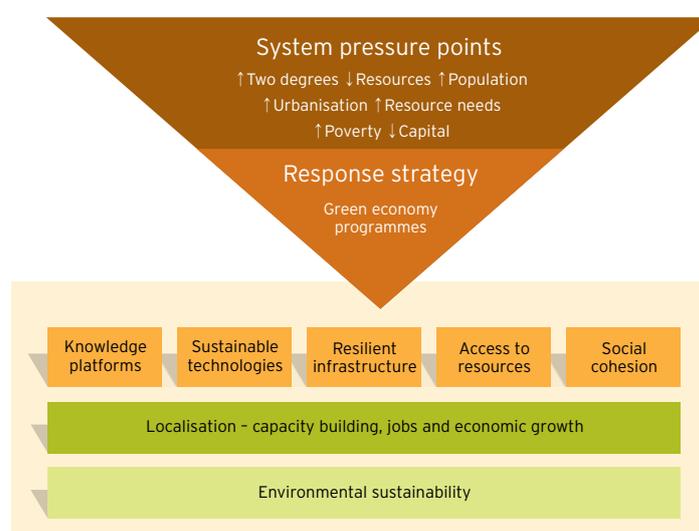
The process has shown that adopting an 'act now' approach to the green economy, through developing programmes that will identify new or build on existing policy initiatives, will contribute to the job-creation ambitions of the government, as set out in the New Growth Path. At the same time, it will elevate the importance of environment stewardship in the context of natural ecosystems and improve societal well-being. The potential exists to create significant new jobs and facilitate reskilling, as carbon-intensive sectors migrate to low-carbon production processes. Prime examples of South Africa's technological innovation and leadership in support of the green economy exist already, such as thin film solar photovoltaic modules and the Joule (an electrical vehicle).

Greening the economy

There is overwhelming consensus that the current natural resource constraints and ecosystem pressures require a shift from conventional economic growth trajectories towards greener alternatives. The concept of a green economy emerged amid calls for growth strategies that are economically and environmentally sustainable (as indicated in the Global Green Deal of the United Nations Environment Programme). It is likely to be the mainstream economy of the future, as the world transitions into sustainable consumption and production patterns. The opportunity exists to make better use of natural resources and use mitigation and adaptation actions as a tool towards a more inclusive development path for countries and regions. In this case, South Africa is well positioned, based on the strength of its existing institutional platforms to support, invest in and implement climate interventions across the Southern African Development Community (SADC) region.

President Zuma, in his closing remarks at the United Nations Framework Convention on Climate Change (UNFCCC) COP 16 Summit (on 9 December 2010), offered the South African position on climate change. He stated that ‘through our actions, we also need to respond to the notion that there is a trade-off to be made between faster economic growth and the preservation of our environment. We must prove that faster economic growth can be achieved alongside the sustainable management of our natural resources’. Against this backdrop, the green economy emerges as response strategy to transition South Africa into a low-carbon and greener growth trajectory through a combination of mitigation and adaptation response strategies. These will translate technology into development opportunities through greener local industrialisation and climate-resilient infrastructure.

Figure 1: Translating development challenges into green development opportunities



Act now

There are economic reasons for South Africa to 'act now', which go beyond merely the greening of the economy to ensure its sustainability. Energy and water (as well as the other environmental services, like biodiversity) are vital economic inputs that require immediate attention. In addition, as the IPAP 2 correctly points out, there is a 'growing threat of increasing "eco-protectionism" from advanced industrial countries in the form of tariff and non-tariff measures such as carbon taxes and restrictive standards'. The world is challenged to make a fundamental shift in its understanding of development in an age where there is no choice but to 'decouple' growth from the use of natural resources, that is, to move away from development paths that lead to environmental degradation.

Substantial policy reform is required if South Africa is to realise its voluntary carbon emission commitments by 2020 and 2025. At the heart of these reforms will be the requirement to internalise the negative externalities generated by emitters into the price of their outputs. As Nicholas Stern¹ argues, 'Climate change presents a unique challenge for economics: it is the greatest and widest-ranging market failure ever seen.' As markets are unable to internalise environmental externalities, the responsibility to do so falls firmly upon the state.

It is sometimes difficult to 'act now' within a political environment, for the following reasons:

- Greening requires a level of innovation and risk-taking; however, decision-makers, especially at local level, are often conservative in their approach to policy and spending.
- The services provided by the environment are seen as free, and the externalised costs of disease, storm damage or water scarcity resulting from damaged ecosystems are seldom factored into decision-making on spending.
- Similarly, the full life cycle costs of developments and their cumulative impact on ecosystems are not considered.
- Green interventions are perceived to be more expensive, although international precedent shows that the additional investment is small (0-10%) and recoverable from the significant benefits.
- Resourcing green interventions requires access to innovative financing and technical support (addressed later in this report).

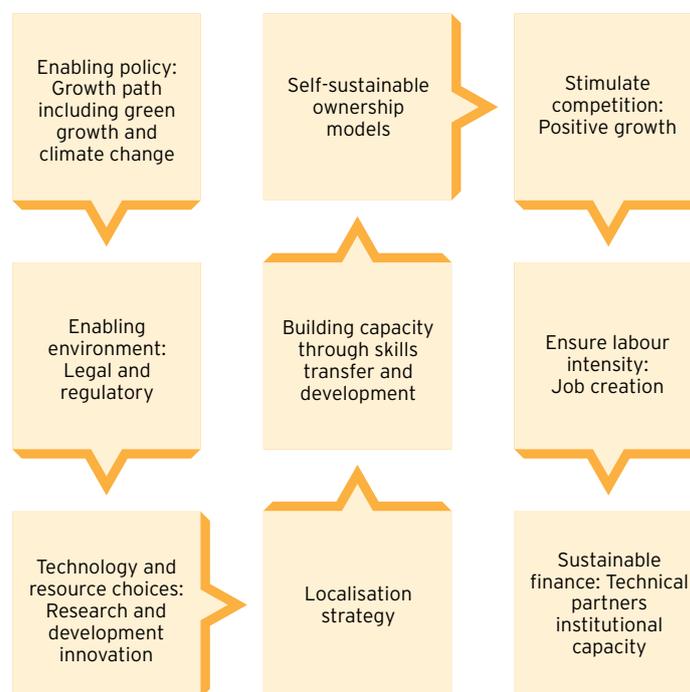
Sustainable new green sector development

A core strategy of the New Growth Path is to encourage activities that can generate employment on a large scale and meet basic needs at lower costs in the short to medium term, while sustaining the development of more knowledge-intensive industries

¹ Chairperson of the Stern Review on the Economics of Climate Change (2006) and of the Commission for Africa (2005).

for long-run growth. Direct linkages exist with this core strategy in terms of the green economy: through technological innovation and development, a local manufacturing base can be established to mainstream environmentally friendly technologies. It would support local job creation and regional integration, and ensure that South Africa transitions to a greener growth path. Sustainable finance, technical partners and institutional capacity are important for the creation of new sectors; however, these are typically the result of creating an enabling policy and investment framework. Such frameworks recognise that investing in the environment offers new opportunities for economic growth.

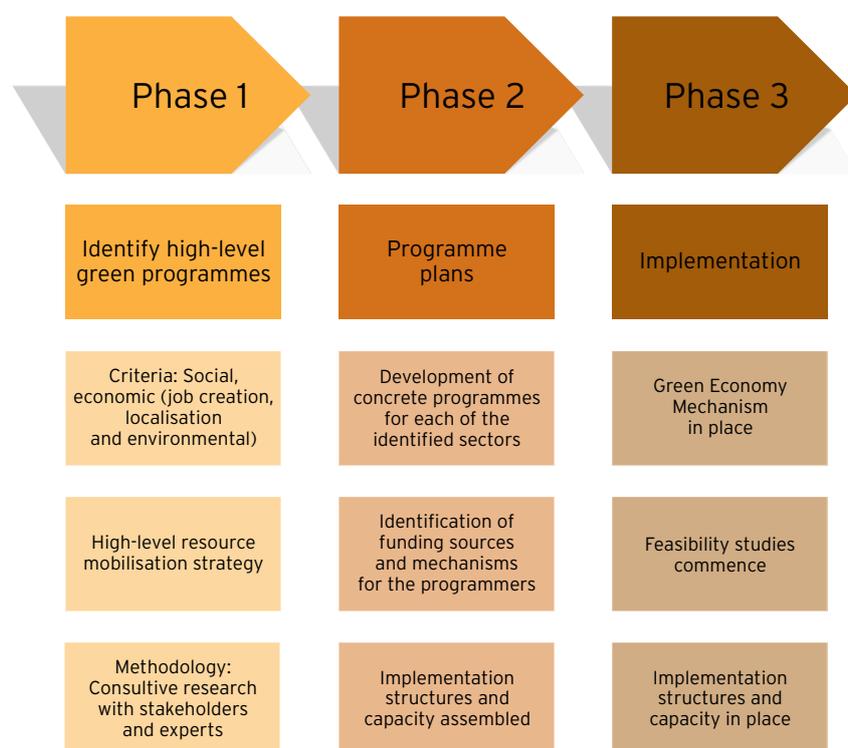
Figure 2: Pathway to a green economy



A three-phased approach

This report represents the findings of the first of three sequential phases to identify green programmes and resource requirements. Phase 1 focused on identifying, at a high level, green economy programmes prioritised according to criteria for social, economic (emphasising job creation and localisation) and environmental sustainability. The process in Phase 1 also set out to identify the resource requirements for these programmes, with a specific focus on a proposal to establish a funding mechanism for green economy initiatives. The methodology adopted for this phase was a consultative research process that relied heavily on existing learning and the input of important stakeholders from the relevant sectors. Phase 2 will elaborate on the programme plans and develop implementation plans for the programmes, while Phase 3 will involve the actual implementation of programmes. This overall process is depicted in Figure 3.

Figure 3: Phases of the Green Economy Programme development



The programmes that have been identified are aligned with government policy, are scalable and, most importantly, will capture the national and policy imagination. They will demonstrate that green ambitions are for the most part not mutually exclusive to but rather mutually supportive of pro-poor, job-creating growth.

Section B: Programme identification

The programme identification approach adopted in this project included the establishment of a project reference group, with representation from the Economic Development Department, the Department of Environmental Affairs, the Industrial Development Corporation (IDC) and the DBSA. This reference group assisted with the overall strategic direction in the identification of priority green economy programmes. The Economic Development Department and the Department of Environmental Affairs also facilitated reporting to the Employment and Economic Cluster as co-chairs of the Green Economy subcommittee of the Cluster. Furthermore, a Roundtable was held with government departments on 26 October 2010 to share the approach of the work of Phase 1 and review roles and initiatives across government at the national level. Subsequently, on 9 November 2010, a programme identification workshop was held at the DBSA, with over 100 representatives from the government, state-owned enterprises, development finance institutions, the private sector and non-governmental organisations.

Programme scan

Phase 1 involved two stages, the first of which was a scan of the environment to establish a list of green economy programmes. This was done through analysing the following sources:

- Important government policies, such as the New Growth Path, the IPAP 2, the Integrated Resource Plan 2010, the Medium-Term Strategic Framework and associated Outcomes, and the outcomes of the Green Economy Summit
- National and international frameworks, strategies and analysis on the green economy²
- Responses to the Call for Expressions of Interest in Green Economy Programmes by the Department of Environmental Affairs.

The output from this process was then categorised according to themes consolidated from those adopted at the Green Economy Summit, namely:

- sustainable consumption and production
- green buildings and the built environment
- sustainable transport and infrastructure
- clean energy and energy efficiency
- green cities and towns
- resource conservation and management
- sustainable waste management practices
- agriculture, food production and forestry
- water management

Prioritisation matrix

The next stage of the process involved the development of a prioritisation matrix based on short-, medium- and long-term impacts to facilitate the selection of programmes from the green programme list. The prioritisation of programmes favoured those that have the greatest potential for net benefit across the social, environmental and economic dimensions. The starting point was that prioritised programmes must provide a net benefit to the environment to be 'green' and have a positive impact on growth, with an emphasis on jobs and the localisation of industrial opportunities.

The prioritisation process adopted a two-step process. The first was a 'no implementation constraints' lens to allow for the initial prioritisation of the programmes that were

² McKinsey (2009), Pathway to a low-carbon economy; ILO/UNEP (2008), Green jobs: Towards decent work in a sustainable, low-carbon world; OECD (2010), Interim report of the green growth strategy; UNEP (2009), Rethinking the economic recovery: a global green new deal; DEA (2010), Outcome 10: Protected and enhanced environmental assets and natural resources; DEA (2010), Results of the expression of interest on the green economy; DBSA operations and priority sector briefs; IDC/DBSA Green Jobs project.

most scalable and had the most impact, before considering practical implementation modalities. The purpose of this approach was to ensure that programmes with the greatest potential impact were not immediately discarded if perceived barriers to implementation were high. This assumed that where massive impact is possible, implementation solutions can and will be found.

The criteria included the following:

- Impact on resource availability (quantity/scale measure)
- Impact on jobs (net and per volume unit)
- New industry development and localisation potential
- Cost per volume unit
- Impact on quality (ecological footprint of programme), for example:
 - CO₂ savings (energy and transport)
 - Improvements in water and soil quality
 - Increase in the quality and levels of biodiversity
- Direct impact on access for the poor (yes/no), for example:
 - Bus rapid transit (BRT) systems in metropolitan areas versus high-speed passenger trains
- Tradability (export orientation)
- Balance of payments impact
- Spatial impact (investment deconcentration potential)

The second step was to consider the potential constraints to the implementation of each programme, as well as potential ways to overcome these. Linked to this was the identification of enablers that could facilitate the successful implementation of the programme. The following potential enablers and constraints were considered:

- legislation/regulation
- political will and desire to act
- availability of skills
- institutional capabilities and mandates
- research and development/technology
- funding, including leveraging of funds
- partnerships

Additional elements considered in the design of the programmes took into consideration the timelines to implementation of the programme (short, up to three years; medium, three to eight years; and long). In particular, programmes that may be focused on short-term objectives should, in the medium and long term, develop into sustainable programmes (in both economic and environmental terms). For example, short-term job-creation schemes in waste recycling should, in time, lead to viable small enterprise development. Also important was to identify existing pilots or test cases that can be assessed in Phase 2, as the programmes are further scoped for implementation.

Engagement process

The consultative process was designed to accommodate a wide range of stakeholder inputs to ensure the inclusion of programmes from the spectrum of possible green economy initiatives. A workshop, attended by over 100 interested parties, was held to help confirm the long list of programmes and begin the process of prioritisation. The participants came from all sectors. Given the compressed timeframe, only limited original research was done and 'due diligence' processes followed but the process remains highly robust.

The programmes identified here lend themselves to action for the following reasons:

- They are focused on all aspects of sustainable development (both the 'green' and the 'economy' of the green economy, and social benefits).
- They are aligned to government priorities and policies.
- They present significant potential for job creation through technology, innovation and unlocking new jobs and enterprises.

Section C: Proposed green economy programmes

The prioritised programmes described herein propose practical interventions which, if implemented, will have a significant impact on mainstreaming green economy approaches to the benefit of the environment, economy and society. They will promote growth while reducing pollution and greenhouse gas emissions, minimise waste and inefficient use of natural resources, maintain biodiversity and strengthen energy security.

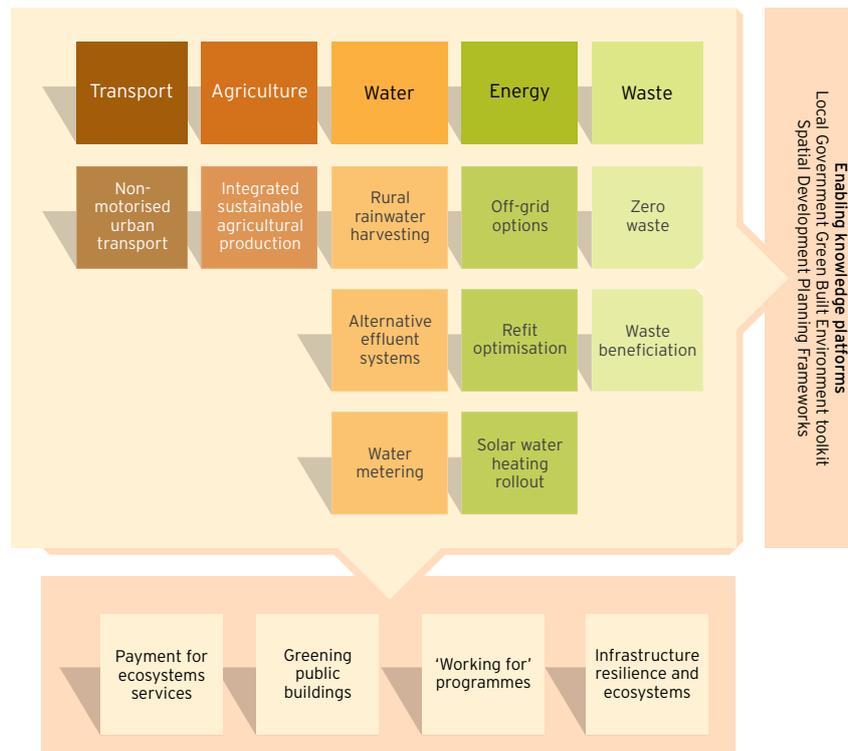
The proposed programmes are not intended to be an exhaustive or exclusive list. Rather, they should be considered a sensible first take on programmes that underpin and advance the restructuring of the economy into a new and more sustainable growth path. They indicate areas of severe resource constraint, already acknowledged by the government, and give further impetus to work underway in line departments. The following matrix demonstrates the potential suite of programmes prioritised through this process:

Figure 4: Qualitative programme scoring matrix

No.	Project	Jobs	Industry and localisation potential	Rural development	Addresses income inequality	Access to services	Resource volume improvements	Resource quality improvements
1	Scaled up rollout of solar water heaters	High	High	Low	Low	High	High	High
2	Refit optimisation for large-scale renewables and localisation	High	High	Low	Low	Low	High	High
3	Expand off-grid options in rural and urban large-scale infrastructure programmes	High	High	High	High	High	High	High
4	Zero Waste Clean Community Programme for 500 000 households	High	Low	Low	High	High	High	High
5	Upscaling, expansion and improvement of the current 'working for' programmes	High	High	High	High	High	High	High
6	Rural livelihood resilience through rainwater harvesting	High	High	High	High	High	High	High
7	Reduce water losses in agriculture, municipalities and mining	High	Low	High	Low	Low	High	Low
8	Strengthen demand-side management, through comprehensive municipal water metering systems	High	High	Low	Low	Low	High	Low
9	Alternative technology for effluent management in small towns	High	Low	High	Low	High	High	High
10	National payment for Ecosystem Services Programme	High	High	High	High	Low	High	High
11	Integrated sustainable agricultural production systems	High	High	High	High	Low	High	High
12	Promoting non-motorised transport in South African metros in support of BRTs	High	High	Low	Low	High	High	High
13	Government leadership programme in greening public buildings and precincts	High	High	Low	Low	Low	High	High

Figure 5 indicates the industrial and infrastructural location of programmes. These include water, waste, agriculture, energy and transport. It also includes programmes of a cross- or multi-sectoral nature, termed ‘green resource programmes’, and relevant enabling tools.

Figure 5: Summary of green economy programmes and enabling platforms



Green industrial and infrastructure programmes

1. Government leadership programme in greening public buildings and precincts

Government buildings and developments offer an excellent opportunity for providing leadership, setting an exemplary trend for new buildings and retrofitting existing buildings where feasible. A programme to support the initiatives of the Department of Public Works in greening public buildings provides an opportunity to develop norms and standards for green upgrades, which can be incorporated into future development guidelines. In addition, there are proven economic advantages to lowering the cost of water and energy consumption and increasing productivity.

The programme addresses material and technology interventions for individual buildings and public spaces to improve their environmental and social functioning.

It aims to demonstrate model green developments through a government leadership programme in greening public buildings and precincts. Certain national role-players

and several municipalities are already working on aspects of this programme. In general, although there are national role-players involved, municipalities are the key to its implementation, and coordinating and supporting their capacity to deliver should be a major focus.

2. Scaled-up rollout of solar water heaters

Solar water heaters have been identified as an important intervention for shifting demand by replacing electricity consumption with solar heat. The government's Solar Water Heating Programme has set a target for renewable energy to contribute 10 000 GWh of final energy consumption by 2013. It is estimated that solar water heating could contribute up to 23% of this target. In addition, solar water heaters have been identified as a means whereby renewable energy could significantly contribute to alleviating poverty, through improving the general welfare of households and developing productive activities to generate employment. While there is policy support for rolling out solar water heaters, challenges remain for the rollout to be achieved at the required scale. Both demand- and supply-side solutions have to work synergistically. Solar water heating is one of the interventions that has the greatest potential to contribute to meeting the government's renewable energy target.

In particular, the programme could:

- Accelerate the implementation of a million solar water heaters by 2014.
- Investigate the possibility for municipalities to put in place appropriate regulations for new developments.
- Request development finance institutions to investigate the provision of wholesale finance schemes at low interest rates to be retailed by banks and insurance companies.
- Provide research and development incentives to lower the cost of solar water heaters.
- Collaborate with the Department of Public Works on the rollout of solar water heaters at scale in government establishments. Use these procurements to enter into arrangements that lower the costs of solar water heaters in the long run.
- Review tariff schemes in order to support localisation rather than encourage imports.
- Study the regional market potential for solar water heaters and ascertain whether South Africa can serve as a hub.

The demand or potential for the installation of solar water heaters is immense. According to the draft National Solar Water Heater Strategy and Implementation Plan, 6,3m low-income households do not have geysers. They use stoves and kettles to heat water. In addition, approximately 400 000 geysers burst each year and could be replaced with solar water heaters.

Solar water heaters can build on existing momentum. Three metropolitan areas, Cape Town, Durban and Port Elizabeth, have existing interventions that are above 10 000 units. Large-scale rollout will be tied with local manufacturing. Job creation will come through the manufacturing of the solar units, installation, plumbing and maintenance.

3. REFIT optimisation for large-scale renewables and localisation

Diversifying the energy mix is widely accepted as having a significant and positive impact on the carbon intensity of the economy. It provides a strong foundation for green economy initiatives to be systemic rather than peripheral.

The government's White Paper on Renewable Energy Policy (2004) supports the establishment of renewable energy technologies, targeting the provision of 10 000 GWh of electricity from renewable resources by 2013. This has the potential of creating 35 000 jobs and adding R5 billion to the gross domestic product and R687 million to the incomes of low-income households. By late 2005, the Department of Minerals and Energy completed a Renewable Energy Target Monitoring Framework to ensure that progress towards the 2013 target is effectively monitored. The New Growth Path identifies a potential for large-scale job creation in the development of a robust wind and solar energy sector. In particular, this programme aims to create an enabling environment for upscaling renewable energy investment, by doing the following:

- Examine the potential for concessionary finance to lower the capital costs of renewables.
- Develop a research and development support and innovation system to lower the technology risks associated with clean energy technologies.
- Establish market clarity around the arrangements for the implementation of the Renewable Energy Feed-In Tariff (REFIT).
- Develop local content criteria, including procurement standards for wind and solar localisation.
- Investigate mechanisms to fast-track environmental impact assessments for clean energy projects for both the government and independent power producers.
- Clarify and simplify the procedure and criteria for accreditation and granting of power purchase agreements.

REFIT 1 is being implemented. Tariffs have been set and some institutional matters have been agreed and are being implemented (the most recent decision was on dismantling the regional electricity distributors). Various direct and indirect incentive schemes are in place, such as the depreciation allowances and rebates for research and development. The overall growth stimulated by new investments will increase business and job opportunities, and increase levels of technology, skills, innovation and tax receipts.

Key to scaling up is finalising the Integrated Resource Plan 2010, which is currently available for public comment. This must be supported by a well-designed industrial development strategy. The sustained installation of wind turbines of 200-400 MW per year and 50-100 MW of solar power is crucial to drive investment in localisation programmes for wind and solar power.

4. Expand off-grid options in rural and large-scale urban infrastructure programmes

Energy access is essential for improving quality of life, particularly in areas that do not have grid connections at present. Off-grid solutions offer an alternative to grid-based energy sources and unlock the opportunity for a diverse range of micro-scale renewable solutions to be scaled up, such as small hydro energy, biogas, roof-mounted solar photovoltaic modules and clean stoves. At present, various government agencies have piloted initiatives without extensive state intervention, donor support or other forms of grant funding. Promoting a micro-renewable market has a high potential for the localisation of manufacture and technology development. There are three strategic opportunities:

- Use planned government infrastructure, such as housing for informal dwellers and the expansion of street lighting, as a backbone for growing micro-renewable solutions to scale.
- Facilitate energy access to improve the quality of life of people in deep rural areas.
- Provide off-grid options as a backup, giving flexibility to strategic state and private sector installations.

In particular, this programme aims to create the basis for developing a micro-renewable energy sector through the following:

- Conduct a comprehensive review of existing pilots, especially those being implemented under the auspices for the Working for Fire and Working for Energy initiatives, and establish their potential to be expanded.
- Accelerate the development of the intergovernmental low-cost green energy programme by taking micro-renewables to scale.
- Establish creative microfinance support for improving household uptake of new off-grid technologies (e.g. the National Sustainable Settlements Facility and the national Post Office).

Existing pilot initiatives, such as the School and Clinics Electrification Programme and the Shell and Eskom joint venture on solar home systems, should be considered for lessons and scaling up. Pilots may have to be designed to test new models of financing and technology transfer. Targets for off-grid initiatives include the non-electrical supply of energy to households for clean stoves and other equipment, power to schools not currently on the grid, and solar indoor heating, street lighting and traffic lights. The avoided cost of further investment in grid infrastructure contributes to demand-side management.

Additional benefits include better health from less smoke in informal settlements; improved safety due to a lower fire risk; and ensuring that traffic flows do not negatively affect productivity.

5. Sustainable solid waste management for 500 000 households

The growth in the volume of general waste highlights the economic potential of the waste management sector, with its estimated total expenditure of R10 billion per year. Waste collection and the recycling industry make a large contribution to job creation and the gross domestic product, and there is considerable potential to expand this. An example is a pilot project in Mafikeng, which services 30 000 households. The project has created 75 jobs and five small businesses, which now own their own waste collection trucks. Significant opportunities also emerge from a high-level scan of the waste industry, such as the beneficiation of waste streams, including creating infrastructure for materials recovery facilities; outsourcing waste services to stimulate enterprise development; and waste-to-energy initiatives. Several successful pilots around the country may be scaled up and replicated for the effective implementation of the National Waste Management Strategy. The engagement process identified the need to explore further options in this area, including a detailed scoping of all current programmes and pilots to provide the basis for a coordinated national waste programme that primarily targets local government.

South Africa is experiencing significant challenges in managing its flow and stock of waste. In terms of the Constitution, waste management service delivery is a local government function. Municipalities are obligated to provide waste management services to realise this right. In order to manage waste sustainability recycling is essential. There is already a basis for a recycling industry. This can be seen in existing recycling figures: approximately 1,5 billion tonnes of packaging and paper waste (40% of the consumption of packaging and paper products) is recycled per year. While this is still slightly behind statistics for other developed countries, it provides an established base upon which to build and set targets for the recycling industry. Current recycling rates in South Africa are set out in the table below:³

Recycling rates in South Africa, 2007	
Recyclate	% recycled in 2007
Metal beverage cans	70%
Paper	54.5%
Glass	25%
Plastic	22%

³ www.wastepolicy.co.za/nwms/home/nwms_v1/2/4

In terms of policy and regulations, the National Environmental Management: Waste Act (2008) provides an enabling environment by legislating extended producer responsibility and waste minimisation.

A community-based waste programme targeting 500 000 households could do the following:

- Supply bins (to separate waste at source)
- Initiate a packaging call-back programme
- Facilitate the establishment of collector cooperatives or small businesses (to fetch waste)
- Facilitate the establishment of recycling mini-factories (to harvest material) (e.g. materials recovery facilities)
- Facilitate the establishment of a buy-back centre.

A cluster of consumption and production interventions could be rolled out in under-serviced communities to reduce waste, increase recovery and alleviate poverty through a mix of cooperatives, Expanded Public Works Programmes and public-private partnerships at the municipal level.

6. Upscaling, expansion and improvement of the current 'Working for' programmes

South Africa initiated the Working for Water Programme in 1995. The programme has been recognised internationally as an effective resource management and job-creation initiative within the concept of a green economy. Other 'Working for' programmes have been initiated and continue to demonstrate benefits in terms of resource management and job creation. However, there is a need to:

- Expand the efforts of the programmes, especially in terms of broader ecosystem rehabilitation and river management.
- Ensure that existing programmes are fully functional and adequate to achieve effective outcomes.
- Integrate the planning and implementation of the programmes to ensure that benefits are sustained.

In particular, the programme could:

- Expand Working for Land into a comprehensive rehabilitation programme in all ecosystems to restore and maintain productive capacity. This could include a broad-based ecosystem assessment and monitoring programme, which would provide employment and develop skills in its own right.
- Introduce a Working for Rivers programme to address river restoration and law enforcement on river systems, from catchment to point of use.

- Expand the People and Parks programme beyond the current infrastructural focus to include the creation of local economic opportunities for the provision of products and services to parks.

The main outcome will be improved resource management. The level of job creation could be greatly increased from current levels (an estimated 30 000 to 40 000, mainly in the Working for Water programme) to around 100 000 (or more) jobs in the combined programmes. However, note that the programmes are usually not permanent in any specific area; there needs to be a greater emphasis on skills development and enterprise creation so that beneficiaries can use the economic opportunities created as a result of the programmes.

7. Rural livelihood resilience through rainwater harvesting

Seventy percent of the country's poorest households live in rural areas, and too few are food secure throughout the year. Poor nutrition has severe implications for young children (causing stunting) and those with compromised immune systems. Increasingly variable rainfall and weather patterns – more droughts, floods and storms, higher temperatures and drier soils – are likely to compound poverty unless steps are taken to improve the resilience of rural livelihoods.

There is an urgent and widespread need for strategies to strengthen the resilience of rural households in the face of poverty and growing climate variability. Providing water for productive purposes through rainwater harvesting supports household food security and the possibility of a wider range of productive uses.

In particular, the programme could entail the following:

- Landscaping to optimise water infiltration and retention
- Construction of large holding reservoirs to capture run-off
- Provision of gutters and rainwater tanks on schools and houses
- Greater availability of water for productive purposes – from brick-making to hair salons, each with its own job-creating potential
- More sustainable food production, with better local food security
- Greater resilience in the face of more erratic rainfall.

A programme targeting 10 000 households would create 30 000 person days of employment for skilled technicians and 90 000 person days for unskilled workers. Additional work would be created for skilled facilitators and trainers, who would be responsible for mobilising and training households in food production.

8. Reduce water losses in agriculture, municipalities and mining

Economic growth, population growth, rising standards of living and increasing climate variability are putting growing strain on scarce water resources. In order to support sustainable economic growth and social development, South Africa's water resources must be used more effectively. This requires a strong drive for water conservation and water demand management (WC/WDM), and supporting resources.

Each of South Africa's metropolitan areas faces significant water shortages in the next few years unless major WC/WDM interventions are initiated. Current estimates are that at least a quarter of available municipal water is lost between reservoir and tap, owing to network leaks and bursts. As municipal water supply is the fastest growing water-use category, the most strategic gains in water savings and water loss reduction lie in reducing municipal water losses arising from aging or poorly maintained network infrastructure. The cheapest source of additional water available to South Africa's expanding cities is the water that is already supplied to them.

The programme will build on existing initiatives at municipal level. In particular, the programme provides for a funding mechanism and a facilitation unit to assist major users, primarily commercial agriculture and municipalities, in planning, packaging and securing funding for programmes to reduce water loss.

The Funding Facilitation Unit could have the following functions:

- Increase awareness of the need for WC/WDM to ensure that effective use is made of its services and of the available funding. The Funding Facilitation Unit should proactively create the market for its services by driving the promotion of WC/WDM.
- Facilitate the provision of loans and/or grants to important water users (water services institutions, water management institutions, state-owned enterprises, government departments, private sector enterprises and individual water users) to enable the implementation of WC/WDM interventions.
- Appoint and co-manage (with applicants) implementing agents to run projects where the management capacity does not exist.
- Work with development finance institutions and commercial banks to use existing financial products to ensure funding for WC/WDM interventions.

The Funding Facilitation Unit would need to make limited grant funding available for pilot projects, feasibility studies, project proposal development and co-funding purposes. The Funding Facilitation Unit may be a 'window' underpinning the sustainable water management theme and be supported through the proposed Green Economy Mechanism described herein.

Aside from the major benefits of saving critical water resources and ensuring that these are directed at maintaining jobs in agricultural and other industries, it could provide the water required to extend activities in these industries. An estimate of new job potential is not possible at this stage; however, detailed programme planning and implementation are likely to yield this data. The mobilisation of funds for infrastructure rehabilitation, renewal and upgrading has the potential to create a large number of jobs in building and construction, as well as in plumbing, electro-mechanical work and the like. The number of jobs would depend, among other things, on the mobilisation and drawdown of funds.

9. Strengthen demand-side management, through comprehensive municipal water metering systems

As indicated in the previous programme, the biggest gains in water loss reduction lie in lowering distribution losses, mainly in municipalities and commercial agriculture. However, it is essential to complement these by a range of strategies to promote water-use efficiencies and reduce leaks and losses at household level.

This proposal addresses one of the most important instruments for incentivising, monitoring and improving water demand management: comprehensive water metering.

In particular, the programme could:

- Require the retrofitting of water-efficient devices.
- Propose mandatory installation of specified fittings of a prescribed quality in line with national regulations and standards.
- Train local artisans for household and municipal maintenance – to ‘walk the lines’ to identify leaks and bursts, do basic repairs, check household fittings for leaks, and the like.
- Require universal metering for all stand-level connections, as an essential prerequisite for demand-side management strategies.
- Create opportunities for local manufacturers to meet the demand for robust fittings and devices that promote greater water-use efficiency.

Installing a water meter requires a day of labour from an unskilled worker and 0,25 days of a skilled worker. There are three million households without water meters. If 600 000 units were to be installed over a five-year period, this would lead to the creation of 2 000 unskilled and 500 skilled jobs per year over the period.

10. Alternative technology for effluent management in small towns

The technology for an advanced waste stabilisation pond system is robust and proven, widely used in other countries and has a mature learning curve. The programme draws on Asian advances in the last decade around biogas capture and utilisation, and demonstrates carbon-neutral effluent management. Evidence shows that the technology does not compromise user service levels in any way. When basic sound operating and management principles are followed, it offers a range of positives, including job creation, substantially lower running and life cycle costs, a low rate of failure, possible income from trading carbon offsets, the use of nutrient-rich treated effluent in local horticultural projects, and fewer negative externalities for downstream water users.

Successful demonstration of the technology offers the possibility of wider implementation and the redirection of state funds for infrastructure development to technologies more aligned with the objectives of the green economy. The programme offers an important stimulus for a technology-driven paradigm shift.

In particular, the programme could design and implement an initiative for integrated resource recovery from municipal effluent in a small town, with three beneficiation streams:

- Recovery of water of a quality that complies fully with the Department of Water Affairs' General Authorisation specifications
- Recovery of nutrients for use in agriculture
- Harnessing of energy, through biogas production

This programme is essential for the prevention of job losses, as the quality of water affects agriculture and other industries. Poor water quality could result in the loss of export markets for agricultural goods, owing to mounting pressure from the European Union and other developed countries through accreditation processes.

11. National Payment for Ecosystem Services Programme

Payment for Ecosystem/Environmental Services (PES) systems aim to compensate land users for the environmental services they generate. Given that natural resource management is a core pillar of the green economy, a PES programme recognises that the ecosystem/environmental service is essential to economic growth, job creation and technological advancement. Examples of ecosystem services include:

- Vigorous and stable vegetation cover that provides regulation of water flow and precipitation and prevents erosion

- Sustainable soil ecosystems that provide the foundation for agriculture
- Biological diversity, which provides a variety of services, including food, fibre, medicinal products and tourism value

Custodians of ecosystem services, often in poor rural areas, are currently not compensated for these services. As a result, ecosystem service provision is being degraded and poverty persists. A national PES programme could compensate landowners for providing ecosystem services, support poverty reduction and increase socio-economic and ecological resilience. In particular, ecosystem services that could be 'paid for' in the PES scheme include water and carbon sequestration. Successful pilots exist: the Nuwejaars Wetlands Programme, near the Agulhas National Park, established a new model for integrating sustainable agricultural practices with nature conservation. This programme created 250 jobs through nature conservancy and beneficiation.

The benefits of PES may be summarised as follows:

- Efficiency: The conservation effort is focused on the greatest benefits.
- Sustainability: The system is based on self-interest and on services that are required in perpetuity. PES systems attract non-traditional funding sources to support conservation.
- Poverty alleviation: It establishes a steady income stream for rural communities.

In particular, the proposed programme could set up and manage a National Payment System for the Ecosystem Services Programme, supporting the South African National Biodiversity Institute in their efforts.

A pilot study in the Thukela basin showed that the PES approach could increase allocatable water in the basin by 23%. Decreased sediment yield in the basin would create a saving of R4,1 million. Scaling up to ten of South Africa's critical water catchments, the economic value of water currently being lost owing to degraded land is between R526 million and R2,6 billion per year. At a national level, the management of land for water provision through a PES programme could potentially provide 42 000 to 50 000 person years of employment.

12. Integrated sustainable agricultural production systems

South African commercial agriculture is extractive and typically very dependent on high levels of inputs, especially water, fertiliser, pesticides and energy. The negative consequences of this system include resource degradation, high levels of soil degradation, overgrazing, soil erosion, increased incidence of pests and diseases, and the pollution of water, soil, air and food. Small-scale drylands agriculture also has input costs, and is particularly vulnerable to climate variation and global change.

South Africa needs to design and implement appropriate agricultural production systems that will contribute to the following:

- A resilient agricultural sector, with less dependence on input resources
- National and household food security
- Improved livelihoods
- Improved production, income and job creation per hectare
- Effective mitigation and adaptation strategies and the implementation of plans to deal with climate change
- Health benefits to farm workers
- The utilisation of opportunities for niche markets, especially for organic products.

The essential rationale relates to sustainable resource use and efficient agricultural production. Almost all quality arable land in South Africa is utilised and the availability of this land is decreasing owing to land and soil degradation. Irrigated agriculture uses the majority of available water resources and competes with other water uses (such as energy, industry and settlements) for this water. Global change or sustained drought is likely to lead to absolute shortages of water, with potentially catastrophic consequences for agriculture and downstream agro-processing industries. The development of appropriate systems would also enhance the potential success and benefits of land reform.

In particular, the proposed programme could:

- Build enabling environments: Planning, legal and regulatory, governance, risk management, targets and indicators.
- Build skills, capacity and awareness: Consumer, higher education and institutional alignment, accredited training programmes and technology assessments.
- Mobilise dedicated funding: Programme development and implementation.

Over a million households in South Africa own livestock and cultivate land. Appropriate agricultural systems will improve the livelihoods of some of these households and increase opportunities for commercial agriculture towards the New Growth Path goal of 140 000 additional agricultural jobs by 2020.

13. Promoting non-motorised transport in metropolitan areas

Almost 75% of South Africans rely on public transport, yet most infrastructure is geared to car users. This imposes a heavy burden on the government and the poor, while long commuting hours affect productivity, the quality of life and greenhouse gas emissions. Promoting non-motorised transport provides an opportunity to leapfrog the country's transport system into a new era of sustainability and efficiency.

This programme leverages off the bus rapid transit (BRT) and Integrated Rapid Public Transport Network (IRPTN) initiatives currently underway in 12 cities (Johannesburg, Tshwane, Ekurhuleni, Polokwane, Rustenburg, Mbombela, Mangaung, eThekweni, Msunduzi, Buffalo City, Nelson Mandela Bay and Cape Town). The related land-use projects would include densification and infilling around the BRT/IRPTN trunk corridors, transit-oriented development around stations, and transport demand management initiatives. Non-motorised transport projects would include urban design, infrastructure and vehicle components, such as cycling, pedi-cabs and walking.

In particular, the programme could:

- Develop a Future City Transport Vision
- Develop transit-oriented development around BRT stations
- Target transport demand management through effective parking policies
- Implement urban design for walking and cycling
- Introduce bicycle sharing and pedi-cab schemes
- Support green transport activism

Construction opportunities exist in the implementation of the programme, as do localisation opportunities in the manufacturing of bicycles and pedi-cabs. Opportunities for increased innovation in green materials, technology and industry to produce bicycles and other equipment, systems and skills should be maximised. Increased public transport will reduce the social wage, increase productivity and safety, provide more infrastructure for the same levels of expenditure (roads are expensive to build and maintain) and reduce emissions. Related technological investments in the transport sector, such as the Joule, can be linked to this programme.

14. Sustainable infrastructure and ecosystem integration

This green resource management programme strengthens resilience in settlements by decentralising essential service provision and supporting the capacity of biological and ecosystems resources to provide services. With increasing risks of energy shortages, water scarcity and extreme weather caused by climate change, reliance on these centralised utilities makes large numbers of people vulnerable to the breakdown of services. A related aspect is the scaling up of ecosystem integration initiatives into the built environment. Increased city afforestation and green roofing, in particular, have significant environmental benefits in preserving biodiversity, attenuating the local climate and preventing urban heat islands. Further benefits include pollution mitigation and water retention. For example, the ability of green roofs to slow down and retain water has resulted in them becoming

a mandatory requirement in Germany.

In particular, the programme could:

- Establish a sustainable infrastructure rebuild programme
- Maintain infrastructure and ecosystems in combination to mitigate against natural disasters
- Create a focus on sustainable lifestyles through green neighbourhood development
- Promote initiatives such as green roofs and urban forestry for food, medicines and timber

15. Spatial development planning frameworks

Spatial planning needs urgent attention and interventions to ensure meaningful progress towards a sustainable built environment. Although interventions at the level of individual buildings are important, even the most conscientious green implementation will not have a meaningful impact on resource consumption and environmental harm if approached in a compartmentalised fashion. A focus on macro-planning processes would facilitate a critical review of existing economic and infrastructure development. It would aim to make the best use of available resources to transition to a more sustainable economy while taking into account the impact of climate change and peaks in resource availability.

In particular, such a strategic macro-planning process would need to propose new infrastructure investment and incentives to catalyse adaptive economic restructuring, taking into account the following issues:

- Scaling up of renewable resource production to offset a decline in mining due to resource depletion, increasing energy costs and the impact of climate change
- Product research and development, and replacement with renewable resources instead of minerals and petrochemicals
- Low-energy transport links for bulk goods that must move (e.g. minerals), combined with strategies to reduce the transport of goods that can be produced locally
- Development assessment and approval based on a strategic environmental analysis of cumulative impact within a particular ecosystem
- Planning for climate adaptation due to the projected impact on agricultural productivity
- Efficient use of mineral resources by considering the location of new activities to support green product industries.

The main outcome of the planning process is to ensure that the prerequisites for interventions in the local and regional built environment lead to greater environmental sustainability.

16. Local government green built-environment toolkit

Government-linked organisations such as the South African Cities Network and the South African Local Government Association play an important coordination and information-sharing role to facilitate learning exchanges between municipalities. These platforms should be further supported to share innovation, lessons learnt and practical implementation tools. Knowledge sharing should be facilitated to develop a green built environment toolkit for the following:

- Approaches, policies, legislation and regulatory incentives required at local government level.
- A suite of practical guides to ensure that line departments and private developers implement more integrated and environmentally appropriate development with regard to retrofits, new developments, infrastructure development and ecosystem maintenance.
- Case study references of the body of knowledge developing across the country to facilitate scalable and replicable programmes that leverage established precedent.

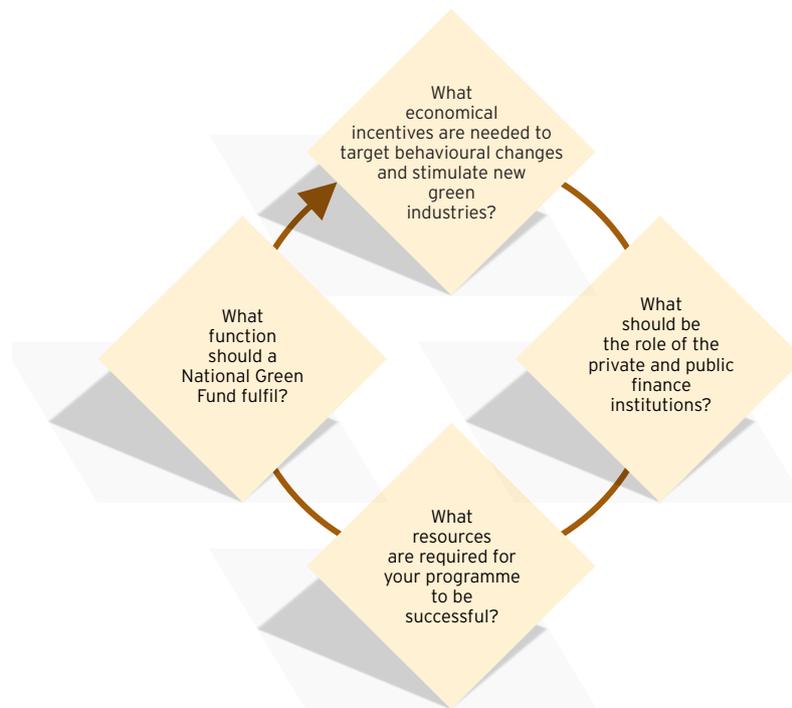
The primary outcome of the toolkit is to invest in institutional capacity building and knowledge transfers between municipalities. Building on the lessons emerging from the existing interventions will facilitate future scalable and replicable programmes, and forms the prerequisite for programmes around implementation.

Section D: Green resource mobilisation

Engagement process

The engagement process referred to in Section B included a working group specifically focused on the mobilisation of resources to advance the green economy. The primary question that the group sought to address was the need for a national Green Economy Fund. Previously, there was consensus that a green information portal/database is necessary in the short term to provide information on the sources of green funding in South Africa and the procedures for accessing such funds. Coordination and knowledge sharing of the resources available for investing and capacitating green project developers are necessary for programme delivery at the scale required. The outcome of Phase 1 is an important stepping stone towards a cohesive national plan around the green economy. However, as per Figure 6, the following questions were posed of this component of the process:

Figure 6: Resource mobilisation questions to advance the green economy



Problem statement

The Copenhagen Accord called upon developed countries to provide to developing nations new and incremental sources of funding for climate interventions of \$30 billion in the short term (2010 to 2012) and a longer-term target of \$100 billion per year by 2020. These amounts are to be aggregated in a proposed global climate fund. It is evident that a comprehensive package for climate financing is required, which combines public and private mechanisms. These may include market mechanisms blended with different funding sources (such as multilateral finance, bilateral finance, private wealth and pension funds, carbon credits or Reducing Emissions from Deforestation and Forest Degradation (REDD) credits) and different enabling instruments (such as government guarantees, risk sharing, insurance, taxes and fiscal incentives). After the UNFCCC Cancun negotiations, these proposals have translated into a global agreement to create the institutional mechanism for a Global Green Climate Fund, with the World Bank serving as the secretariat.

The South African financial system manages long-term assets of over R37 trillion,⁴ thus the investment potential is significant to position the country as a primary investor in funding the transition to a greener economy. Anecdotal evidence through ongoing debates throughout South Africa suggests, however, that there is a lack of concessionary funding as well as institutional hurdles to creating an enabling environment for further

4 Alexander Forbes survey, September 2010.

initiatives. Certainty regarding these issues would enable the country to create a firm basis for accessing international climate finance.

Contributions from private financial institutions indicate that green economy projects have to be supported by robust policy frameworks with clearly defined national targets and strong economic incentives. Integrated development plans would provide market certainty through policy direction to the private sector. In turn, this would lead to greater investment in technology development and diffusion, increased job creation and local manufacturing capability. Based on engagements with the private financial sector, an enabling policy environment would:

- Develop targeted environmental charges (natural resource taxes)
- Review any harmful environmental subsidies
- Demonstrate a clear signal of public programmes for clean infrastructure and industrial development (research and development)
- Offer indirect support through public guarantees to catalyse market activity

The response of the investment community is likely to be positive, as successful green economy programmes offer the possibility of stable cash flows and large-scale investments over a longer time span with attractive rates of return. For such investments to be facilitated, strong and creditworthy sponsors and guaranteed off-take agreements (e.g. renewable energy) are necessary within a robust regulatory and legal environment. A stable regulatory and legislative framework would support the financial and market innovations necessary for the implementation of large-scale green projects (e.g. solar water heaters and REFIT).

A broad definition of resources is required beyond finance, covering elements such as:

- Programme development and planning
- Investment in local technology development and transfers
- Technical assessment capacity
- Rapid response technical teams
- Project development and implementation support
- Operations and maintenance
- Distressed project support
- Public awareness and education drives
- Local government response and implementation support

The main policy and regulatory challenges that a resource mobilisation mechanism needs to take into consideration include the following:

- The green economy is the 'New business as usual': environmental sustainability and transitioning to green growth is critical for a new development path.
- The green economy is broader than renewable energy and energy efficiency. It includes land use, water and materials.
- Regulation and pricing signals by the state need to be stronger to support accelerated investment by the private sector and to change consumer behaviour.
- Domestic resources should be mobilised to fuel the growth of the green economy (through taxes, pension funds, the private sector and development finance institutions).
- The costing of externalities should be considered in economic development interventions.
- State interventions need to be coordinated to deliver scalable and replicable outcomes.
- The complex global negotiating platform and access to climate finance need to be addressed.

Specifically, a coordinated resource response would seek to address:

- Poor access to information on current green resources in South Africa and the region
- The need to scale up investment in technology
- Insufficient seed capital for project development to support local innovation
- Conditionality of international donors (supplier-driven agenda)
- Capital-intensity constraints (high capital upfront with longer payback periods)
- Green economy resources that are broader than carbon-based/dependent funding support
- The immediate absence of economies of scale and the related costs of finance for investment in local plant, equipment and component manufacturing
- Venture capital for innovative technologies with higher risks and costs, to overcome risk aversion in the private sector

The primary information constraints include poor access to and utilisation of existing information on the granular effects of climate change in planning, inadequate planning and coordination of response strategies, and low institutional readiness and implementation capacity relative to other development priorities.

Existing institutions should be capacitated to implement and drive aspects of the green economy within the context of their existing mandates. South Africa has several development finance institutions at the national, provincial and local level, which are able to facilitate investment and capacity building for green economy programmes within

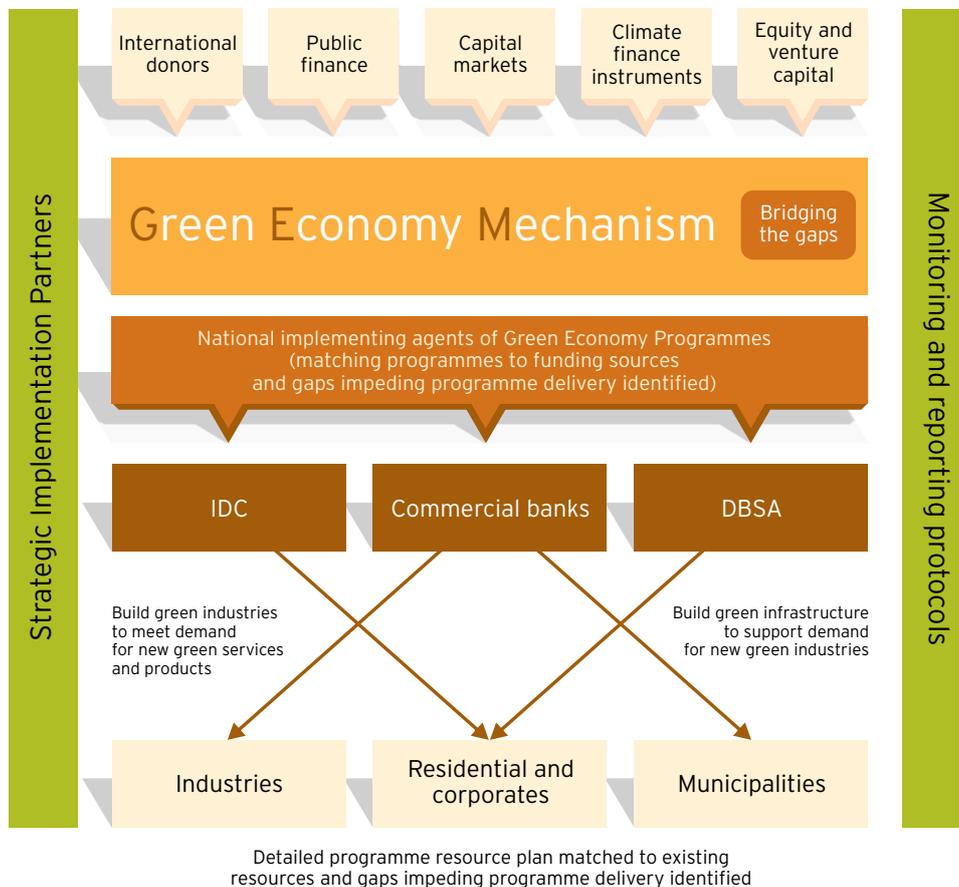
the context of their existing mandates. Once existing channels have been exhausted, alternative and incremental institutional mechanisms should be introduced to bridge the remaining gaps. One of the examples that require addressing is the need for baseline data and monitoring and verification capacity. The institutional mechanism that drives the mobilisation of resources should be accessible within a reasonable timeframe, fair and transparent, with minimum wastage on institutional setup and management costs. Further, the institutional mechanism should:

- Establish a resource base across the project life cycle to invest in new sustainable green sectors
- Ensure that resources are mobilised towards creating employment opportunities
- Ensure that resources are a means to improving the livelihoods of the poor and unemployed
- Apply environmental stewardship towards natural infrastructure in pursuing green economy goals
- Unlock the domestic savings and investment potential in the South African economy
- Blend private and public capital through risk-sharing partnerships
- Reduce reliance on international donor or investment sources
- Enable fair, transparent and efficient access to resources
- Establish cooperative, demand-driven partnerships with local and international stakeholders
- Position South Africa as a regional conduit to stimulate the regional green economy.
- Secure incremental and additional funding needed for climate proofing.

Proposed Green Economy Mechanism

A national Green Economy Fund is better positioned as a virtual mechanism to channel funds to the institutions and programmes that are mandated for implementation. A Green Economy Mechanism (GEM) is proposed as an engagement platform between public and private financing institutions to advance the national green economy agenda and support the priority programmes. An illustrative example of the facilitation process is depicted below. Note that the mechanism would be equally accessible to micro finance and national, provincial and local development finance institutions, and the sources of funding 'crowded in' would be blended. The examples of the DBSA and the IDC are included for illustrative purposes to show the synergies between the two development finance institutions in building the demand for green infrastructure, while investing in the development of green industries.

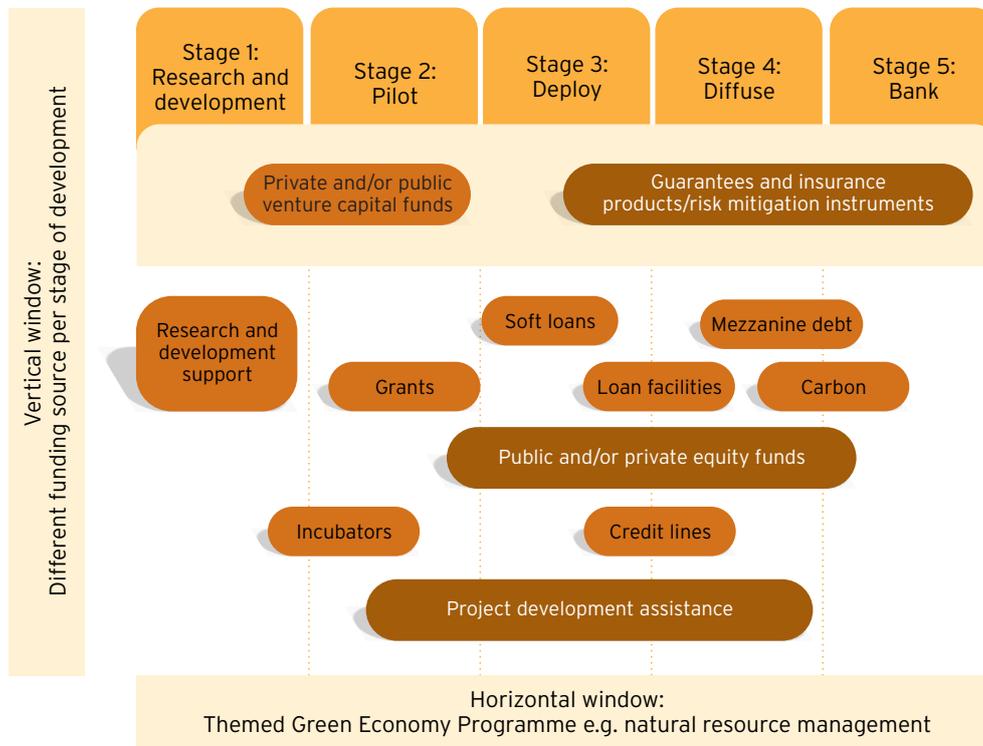
Figure 7: Illustrative use of the Green Economy Mechanism



The success of the GEM would depend on an enabling policy environment, detailed programme plans for investment, and targets for job creation and the localisation of manufacturing. The regional impact should also be included, particularly given South Africa’s critical economic role in the region. Aligning the detailed programme plan with resource requirements is the foundation of a sound capital-raising process that is demand driven. The benefits of a coherent and comprehensive plan are significant and will enable South Africa to negotiate funding terms and conditions with the providers of capital. This approach is based on a demand-driven philosophy, whereby the needs of the interventions determine the resources required. Mitigation and adaptation funds would form an integral part of the GEM and may serve as a test case for aggregating a range of donor and investment funds to build the country’s green economy programmes.

The aim of the GEM is to bridge the development gap to deliver new economically, socially and environmentally relevant businesses, jobs and skills. The GEM will consist of horizontal and vertical windows, corresponding with generic programme life cycle activities or sector themes.

Figure 8: Resource windows for the Green Economy Mechanism



Source: UNEP-FI, 2009 (Adapted)

Based on the proposed resource windows, the GEM could create platforms for institutions and project developers to access information on green economy resources. The windows are designed across a project life cycle and thus accommodate a range of stakeholders, including the public, private and non-governmental sectors. Each programme would be mapped across the vertical windows, offering investors and donors an opportunity either to support a specific programme across its life cycle (e.g. energy, water or resource management) or to focus on a project activity, regardless of the programme theme (e.g. research or proof of concept).

It is important that the financial flows emerging from programmes (e.g. carbon credits, PES or incentives) are reinvested in the economy to enable sustainable sector development. For example, the ring fencing of financial flows for programmes described below may be applied to medium- and long-term interventions, particularly through carbon credits and national payment for ecosystem services.

GEM governance considerations

It would be important for the GEM to be located and positioned in a transparent, fair and equitable manner, which promotes speed and ease of access. The GEM will require a

Green Programme Secretariat and Green Resource Facility that are accessible to a wide array of stakeholders without creating an unfair market advantage for any one stakeholder. The implementation of the green programmes will require bold government action and support mechanisms to absorb the additional risk from the time-based urgencies of mitigating and adapting to climate change. The latter issue is critical as it directly affects South Africa's global competitiveness owing to the high carbon intensity of the existing economic structure. The monitoring and verification of the growth of the green economy (job creation and enterprise development) and related greenhouse gas inventories are essential elements of the governance landscape of the GEM.

The GEM will not duplicate any existing functionality or cannibalise existing funding and delivery mechanisms and processes. The litmus test for successful involvement of the GEM must be that the delivery is speedier, more robust and replicable. A review of government-led funds should be considered and, in principle, any new institutional structure should support the effectiveness of existing channels, such as the Neighbourhood Development Fund.

Section E: Way forward and conclusions

Phase 1 of the process to identify green economy programmes to support the transformation of the South African economy into a green economy has culminated in this report. The prioritised green economy programmes herein clearly provide 'win-win-win' opportunities. Furthermore, these opportunities are within the country's grasp and ready to be implemented immediately if it were to 'act now'.

Beyond the programme-specific proposals, several broader findings emerge with respect to the implementation of the green economy programme.

Green Economy Mechanism

A wide range of stakeholders support the proposal of a Green Economy Mechanism (GEM) as a means of overcoming certain of the coordination and information asymmetries in the financing of green economy programmes, from inception to implementation. It is proposed that the GEM requires a Green Programme Secretariat and Green Resource Facility to be accessible to a wide array of stakeholders, while removing potentially unfair market advantage for any one stakeholder. Alignment to the Cancun Agreement to set up a climate change fund highlights the need for speedy implementation of this initiative.

Coordination and scaling up of existing initiatives and pilots

The identification of programmes found a high degree of resonance with existing policies and initiatives (see Appendix 1). However, while existing initiatives show that the skeleton

of a green economy approach exists within the government's policy and practice, implementation remains fragmented and piecemeal. There is a dire need for improved coordination and greater prioritisation of green economy initiatives. There are opportunities for a better alignment of existing government incentives and other support programmes, in pursuit of greening the economy.

The programmes identified in this document highlight specific constraints, which are regulatory, institutional or financial, or relate to a lack of political prioritisation. The many pilots and nascent projects serve to provide proof of concept and offer lessons for consideration as the process moves into its second phase.

As alluded to above, the question of synchronisation and coordination is a primary constraint in massifying green economy initiatives. An important component of transforming these high-level programme descriptors into implementation plans is the need to improve synchronisation, coordination and leadership to drive successful and massified implementation.

Further development and refinement of the programmes

It is envisaged that Phase 2 of the process will involve the development of implementation plans for the programmes identified here, with an emphasis on the short-, medium- and long-term opportunities. The resource mobilisation component of the work will be further developed through the establishment of the virtual Green Economy Mechanism. Certain of the programmes identified herein may be prioritised above others, based on the further research and development undertaken in Phase 2. Phase 3 will entail the implementation of programmes.

The Seventeenth Conference of the Parties (COP 17) to be held in South Africa at the end of November 2011 provides, as did the World Cup, an opportunity to showcase the country. The successful launch of green economy programmes as envisaged in this process will illustrate the intention conveyed in President Zuma's closing remarks at the UNFCCC COP 16 Summit that 'We must prove that faster economic growth can be achieved alongside the sustainable management of our natural resources'.

Appendix 1

All of the programmes identified in this report are aligned to the government's Priority Outcomes:

- The solar water heater programme aligns with the Medium-Term Strategic Framework 2010-13 programme on industrial development and the IPAP 2010, where solar water heaters are mentioned as a sector for development.
- The solar water heater and renewables programmes will facilitate the achievement of the Outcome 6 targets of 10 000 GWh of renewable energy by 2013 and 10% of energy produced by independent power producers.
- The off-grid programme responds specifically to the Green Paper on the National Climate Change Response. The sector offers major opportunities for the emergence of new manufacturing industries, as well as installation, operations and maintenance.
- The waste management programme aligns with the Waste Act 2008, the National Waste Management Strategy 2010 (published for comments), the Green Paper and the achievement of Outcome 10, targeting waste collection and recycling.
- In terms of the water programmes, they are aligned with and build on a range of current and emerging government initiatives, including the Department of Water Affairs' Water for Growth and Development strategy and the Green Paper. These programmes highlight the importance of decent employment (Outcome 4) through inclusive growth, and take forward the achievement of Outcome 10 objectives around the protection and enhancement of environmental assets and natural resources. More specifically, the rainwater-harvesting programme responds directly to the Green Paper. The water conservation/water demand management programme builds on and goes beyond the current Medium-Term Strategic Framework 2010 and IPAP 2010, which target water efficiency for buildings.
- The programmes on natural resources and agriculture align with the Green Paper and Output 4 of Outcome 10, which highlight the requirement to place a value on ecosystem services. In terms of agriculture, the programme responds to the emphasis of the Medium-Term Strategic Framework and IPAP 2010 on the development of organic agriculture and the support to the agro-processing industry, an important sector for job creation. It also aligns with the Green Paper response to climate change for agriculture adaptation, and with the New Growth Path, where rural and agricultural development is a primary objective. It supports Outcome 10, which puts forward the protection of high-potential agricultural land as an output, Outcome 4 objectives on employment in agriculture, including the upgrading of farm worker conditions, and Outcome 7 on food security and rural development.
- The sustainable transport programme aligns with the Public Transport Strategy and Action Plan, the IPAP 2, which supports the manufacturing of buses and trains for better public transport, and the Green Paper, which supports public transport and

city planning. These programmes contribute to the Outcome 10 target of reducing by 9% the energy used for transport by 2015, and the creation of manufacturing of transport equipment, and ties into the aspirations of the New Growth Path to reduce the social wage.

- Spatial programmes align with the Medium-Term Strategic Framework 2010 regarding the development and implementation of building standards for water and energy efficiency, the Green Paper on reducing the emissions from buildings, and the New Growth Path. They support the implementation of the South Africa National Standard on energy efficiency for building (SANS 204) and new building standards (SANS 10400).

Appendix 2

The initial list of 'no implementation constraints' programmes

Energy	
Energy efficiency and demand-side management	
	<i>Energy efficiency: Buildings (new and retrofit): Residential, commercial and/or government buildings</i>
1	Ligthing (compact fluorescent lights, LEDs, including street lights retrofitting)
2	Insulation (wall/roof/window)
	<i>Energy efficiency: Other</i>
3	Power storage system
4	Smart grids, including smart metering, smart energy storage and communication
5	Improved cooking stove
Generation	
	<i>Energy generation: Coal</i>
6	Green coal
7	<i>Energy generation: Gas</i>
	<i>Energy from waste</i>
8	Electricity from landfill gas
9	Energy from manure
10	Power plant biomass
11	Biogas (including household biogas digesters)
	Hydro
12	Small hydro
13	Wave technology/power
	Solar
14	Concentrated solar power
15	Solar photovoltaic modules
16	Solar water heaters
17	Solar lighting

18	<i>Geothermal</i>
19	<i>Nuclear</i>
20	<i>Wind: Low and high penetration</i>
21	<i>Pyrolysis</i>
22	<i>Cogeneration</i>
23	<i>Carbon capture and storage</i>

Sustainable consumption and production	
	<i>Industry-specific production methods</i>
1	Appliances (including air conditioning, heating, electronics, etc.)
2	Cleaner production centres
3	Packaging (new biodegradable materials, reduce packaging)
4	Industrial production technology changes
	Cement
	Pulp and paper
	Chemicals
	Coal to liquid or gas to liquid
	Other sectors
	<i>Biodiversity-based or nature-based businesses</i>
5	Production of organic fertilisers
6	Parks green infrastructure upgrading
7	Ecotourism
8	Bioprospecting

Transport	
	<i>Transport modes</i>
1	Urban mass transportation system: BRT (passenger)
2	Passenger rail (including high-speed trains)
3	Mass transportation system applications in freight (road or rail)

<i>Cleaner vehicles</i>	
4	Cars: Hybrid or electric
5	Hybrid buses
6	Electric bikes
7	Bus retrofitting (gas)
8	Motor/vehicle efficiency
<i>Alternative fuels</i>	
9	Gas fuel technology
10	Biodiesel
11	Hydrogen fuel cell
12	Solar production of hydrogen for rail and public transport
13	Biofuel
<i>Roads construction</i>	
14	Roads upgrading programme using environmentally responsible technologies (green roads)

Agriculture, food production, fisheries and forestry	
<i>Farming methods</i>	
1	Reduced slash-and-burn agricultural conversion
2	Conservation agriculture (including conservation tillage)
3	Afforestation
4	Cropland nutrient management, reduced intensive agricultural conversion, low external inputs, organic agriculture
5	Agroforestry
6	Sustainable forest management
7	Sustainable agriculture
8	Sustainable fisheries
9	Aquaculture

Restoration	
10	Degraded forest reforestation
11	Degraded land restoration, soil stabilisation, organic soil restoration
12	Grassland management
13	Biodiversity management and planting of indigenous trees
14	Climate adaptation in drylands
Urban greening and food security	
15	Urban agriculture: Household and community gardens
16	Urban forestry and parks

Waste management	
	Remediation of pollution
1	Remediation of contaminated soil
2	Soil and mine reclamation through the planting of trees (phytoremediation)
3	Biotechnology for waste management
4	Mine sites rehabilitation and solid waste disposal using phytoremediation
5	Recycling
	Steel recycling (scrap)
	Recovery and reprocessing of slag (steel)
	Scrap-based production of aluminium
	Paper recycling
	Non-wood pulp and paper production
	Aluminium can recycling
	Electronics recycling
	Glass recycling
	Compact fluorescent light recycling
	Plastic recycling
	Metal recycling

Water	
	<i>Water conservation, demand-side management</i>
1	Water loss improvements at water distribution systems
2	Smart metering in water
3	Kits for water efficiency/water-saving technologies
	<i>Water resource development/rehabilitation</i>
4	Water desalination strategy
5	Wetland rehabilitation, catchment management initiatives across South Africa, water and river management systems, river restoration
6	Dam rehabilitation
7	Water harvesting
8	Operations and maintenance programme for municipal water services infrastructure management
9	Integrated water management (canal lining and micro-irrigation)
10	Storm water planning
	<i>Pollution</i>
11	Wastewater treatment
12	Addressing water pollution – acid mine water, etc.
13	Rolling out sanitation infrastructure
14	Upgrading and rehabilitation of wastewater treatment works