

Inclusive Green Growth in South Africa: Selected case studies



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Acronyms and abbreviations

AfDB	African Development Bank
BUSA	Business Unity South Africa
CDM	Clean Development Mechanism
DAFF	Department of Agriculture, Forestry and Fisheries
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
DED	Department of Economic Development
DFID	Department for International Development (United Kingdom)
DOE	Department of Energy
DoRA	Division of Revenue Act
DSM	Demand Side Management
dti	Department of Trade and Industry
DWA	Department of Water Affairs
ECA	Economic Commission for Africa
EEDSM	Municipal Energy Efficiency and Demand Side Management
EEP	Energy and Environment Partnership programme
EMS	Energy Management Standards
EPI	Environmental Performance Index
EPWP	Expanded Public Works Programme
GDP	Gross Domestic Product
GE	Genetic engineering
GEA	Green Economy Accord
GHG	Greenhouse gas emission
GIS	Geographical Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH (German Society for International Cooperation, Ltd)
GoSA	Government of South Africa
IEA	International Energy Agency
IEE	Industrial Energy Efficiency
IEM	Industrial Energy Management
IGG	Inclusive Green Growth
JPOI	Johannesburg Plan of Implementation
M and V	Measurement and Verification
MoA	Memorandum of Agreement

MTEF	Medium-Term Expenditure Framework
NBI	National Business Initiative
NCPC-SA	National Cleaner Production Centre of South Africa
NDP	National Development Plan
NFSD	National Framework for Sustainable Development
NGP	New Growth Path
NPC	National Planning Commission
NSEE	National Strategy for Energy Efficiency
NSSD	National Strategy for Sustainable Development
NSWHP	National Solar Water Heater Programme
OECD	Organization for Economic Co-operation and Development
PES	Payment for Ecosystem Services
SADC	Southern African Development Community
SANBI	South African National Biodiversity Institute
SD	Sustainable Development
SDC	Swiss Agency for Development and Cooperation
SDRA-V	Fifth Issue of the Sustainable Development Report on Africa
SECO	Swiss Secretariat for Economic Affairs
SWH(s)	solar water heater(s)
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
WfWet	Working for Wetlands
WSSD	World Summit on Sustainable Development
ZAR	South African Rand

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¹ Presently with the European Commission, Joint Research Centre, Institute for Energy and Transport.

Executive summary

A. Background and introduction

The concept of green economy (GE) and inclusive green growth (IGG) gained prominence in the run up to and during the United Nations Conference on Sustainable Development (Rio+20) conference. The IGG concept is expected to enable countries to adopt a phased approach and learn lessons to inform the design and implementation of green economy policies and strategies. The focus is on harnessing opportunities for inclusive green growth in selected sectors of the economy. It is expected that targeted investments, with accompanying enabling measures in selected sectors of the economy could stimulate inclusive green growth that would provide the desired economic, social and environmental outcomes.

The present report documents good practices and lessons learned in selected inclusive green growth case study in South Africa. The report contributed to informing the preparation of the Fifth Issue of the Sustainable Development Report on Africa (SDRA-V), whose theme was “Achieving sustainable development in Africa through inclusive green growth.”

On the basis of selected South African case studies and sectors the report provides an assessment of the country’s experience in implementing inclusive green growth interventions, in the context of the overall policy framework and mechanisms promoting IGG in South Africa. The analyses of selected case studies document good practices, key successes, challenges and lessons learned. The results of the analyses informed the report’s recommendations on efforts aimed at advancing IGG in South Africa. The following cross-cutting issues were addressed in the report - gender, climate change, employment (particularly for young people) and science and technology. The report is based on information gathered from literature and consultations with relevant sector departments and contacts.

B. Overview of macroeconomic environment

Despite considerable macroeconomic growth over the past 19 years, South Africa is failing to fully achieve its considerable potential. The main reasons include high unemployment and inequality, poor and highly uneven educational outcomes and growing frustration with the failure of the public service to deliver positive outcomes, as well as more sluggish output growth than in other comparable middle-income economies. Furthermore, the sustainability of economic growth is threatened by environmental challenges such as climate change and water scarcity. Moreover, the South African economy is highly energy-intensive; its per capita carbon emissions rank among the highest in the world, as is also the case with a number of developed countries. These challenges also present opportunities for an inclusive green growth path and the transition to a green economy. The opportunities presented by such a transition need to ensure that the resultant development path addresses immediate and pressing development concerns.

C. Green economy and inclusive green growth in the context of South Africa

South Africa defines the green economy as “a sustainable development path based on addressing the interdependence between economic growth, social protection and natural ecosystem” with the following two inter-linked developmental outcomes for the South African economy: growing economic activity (leading to investment, jobs and competitiveness) in the green industry sector; and a shift in the economy as a whole towards cleaner industries and sectors with a low environmental impact when compared to their socio-economic impact. The South African Government’s approach to the green economy has focused on the ambitious plan to transition to a low-carbon and greener economy while also addressing developmen-

tal challenges, especially job creation, poverty and inequality. The Government recognises the need for the economy to be “decoupled” from environmental degradation, severing the ties between economic activity, environmental degradation and carbon-intensive energy consumption.

D. South African policy framework, position and mechanisms to promote inclusive green growth

The South African Government embraces the urgent need to implement inclusive sustainable development initiatives that address national challenges such as poverty, inequality and unemployment. To achieve the structural transformation required for a more equitable and inclusive economy, the South African Government considers the greening of the economy to be of decisive importance. It recognises the need to ‘decouple’ the economy from environmental degradation by severing the ties between economic activity, environmental degradation and carbon-intensive energy consumption. The desired decoupling necessitates a move away from past unjust exploitation of resources that excluded many communities from economic opportunities and benefits while also degrading the environment. Since 1994, South Africa has adopted various initiatives aimed at promoting sustainable development such as the Millennium Declaration, the Johannesburg Plan of Implementation and the South African Outcomes Based Approach adopted by Cabinet in January 2010. To ensure the transition to a more inclusive green growth economy recent national policies and plans stress the need to transform the South African economy to embrace equity and sustainable development. Examples include: the South African framework for responding to economic crisis, the Global Green New Deal of the United Nations Environment Programme (UNEP), the National Development Plan Vision 2030, the New Growth Path, the Green Economy Accord and the National Strategy for Sustainable Development. A number of key programmes and interventions are being implemented in various sectors such as energy and the environment. The National Development Plan Vision 2030 adopted by Government at the end of 2012 provides an overarching policy framework for driving IGG principles in South Africa while also addressing the developmental challenges facing the country (poverty, unemployment, inequality and environmental issues).

E. Case studies of good inclusive green growth practices in South Africa

- (1) *National Solar Water Heater Programme (NSWHP)*: The programme was launched in April 2010 by the President of South Africa, Jacob Zuma. Through its Department of Energy (DOE) the South African Government announced a national target of installing 1 million solar water heaters (SWHs) over the five-year period ending in April 2015. The Government allocated ZAR4.7 billion for the implementation of this programme through the medium-term expenditure framework. The programme participants include both Government and non-governmental actors. The three key players are the Department of Energy, for funding, Eskom, for implementation (programme procurement), and the municipalities as the beneficiaries. The implementation of the programme is supported by the Inter-departmental NSWHP Steering Committee. The non-governmental actors involved include project management companies, locally based SWH manufacturers and installation and maintenance enterprises. The programme’s design and implementation integrate the three dimensions of sustainable development (economic, social and environmental). The implementation of the NSWHP supports national programmes addressing current developmental challenges and environmental sustainability as spelled out in the National Development Plan Vision 2030, and in other national planning documents mentioned above.

- (2) *Municipal Energy Efficiency and Demand Side Management (EEDSM) programme*: the municipal EEDSM programme is one of the energy efficiency improvement programmes that have been implemented in addition to the Public Building Energy Efficiency Programme, the Industrial Energy Efficiency Programme and other private sector initiatives. The programme has three main partners: the Department of Energy, the National Treasury and the German Society for International Cooperation, Ltd (GIZ). Other key stakeholders involved in implementing the project include: municipalities, South African local government, the city energy support unit and the South African cities networks. Stakeholder engagement for the project is through a series of technical workshops, seminars and meetings. The expected outcomes of the programme are to assist municipalities to reduce their electricity bills by optimizing energy use, improving the delivery of services, reducing greenhouse gas emissions, and retrofitting existing facilities such as street lighting, traffic signals, municipal buildings, water pumping and waste water treatment. In addition to contributing to reducing greenhouse gas emissions, the programme contributes to service delivery in the country's municipalities by providing an important platform for implementing various national recommendations outlined in key planning documents such as the NDP 2030, the NSSD, and the IRP 2010.
- (3) *The Green Fund*: through the Department of Environmental Affairs the Government of South Africa has made available ZAR 1.1 billion over three years (from 2013) to initiate a Green Fund which aims to facilitate investment in green initiatives to transition South Africa to a greener economy and to support socioeconomic development. This will facilitate the implementation of various IGG initiatives recommended in the national green economy 2010 and the green economy accord reports, as well as in programmes outlined in the NDP Vision 2030 and other national documents. The Green Fund is a collaboration between the Development Bank of Southern Africa as the implementing agent of the Green Fund, and the Department of Environmental Affairs. In terms of supporting inclusive green growth in the country, the Green Fund is designed to:
 - (i) Deliver positive environmental, economic and social returns;
 - (ii) Promote innovative and high impact green programmes through catalytic finance that enables them to scale up and eventually be replicated elsewhere in the country;
 - (iii) Strengthen capacity to mainstream green and climate issues into South African economy and society;
 - (iv) Build an evidence base of projects to inform future green programmes; and
 - (v) Attract additional resources by leveraging and blending financial and other resources.

Overall, the Green Fund is an important vehicle enabling South Africa to showcase various IGG initiatives that can be assessed in terms of their contributions to addressing both national development challenges and environmental sustainability issues such as a reduction in greenhouse gases.

- (4) *Industrial Energy Efficiency improvement (IEE) project*: the project was established in 2010 by UNIDO as a collaborative initiative between the South African Government through the Department of Trade and Industry and the Department of Energy, the Swiss Secretariat for Economic Affairs (SECO) and the United Kingdom Department for International Development (DFID). The project is hosted by the National Cleaner Production Centre of South Africa, and is being implemented together with the United Nations Industrial Development Organisation (UNIDO). The design of the project involves strong partnership between Government, business and international organisations. The project aims to contribute to the sustainable transformation of industrial energy usage practices in South Africa and possibly in the Southern African region by "putting the system of Energy Management Standards (EMS) in place and

facilitating its use by industries in the agro-processing, chemical and liquid fuels, mechanical engineering, automotive and mining sectors". The project aims to stimulate demand for energy efficient services by:

- (i) Formulating and implementing an enabling policy framework, including a financial mechanism supporting energy efficiency;
- (ii) The creation of institutional capacity to implement the EMS;
- (iii) Awareness-raising;
- (iv) Energy audits; and
- (v) Local demonstration projects.

Five key industries have been identified as the primary initial focus of the IEE project on the basis of their potential to bring significant reductions in overall energy consumption in South Africa: agro-processing; chemicals and liquid fuels; metals processing and engineering; the automotive industry; and mining. The project aims to contribute to the national energy demand reduction targets of 15 per cent by the year 2015 for mining and industry, and 12 per cent for the country as a whole. It will contribute to the achievement of national targets and recommendations on energy efficiency and also to reductions in greenhouse gas emissions in accordance with the national strategy for energy efficiency.

Energy and Environment Partnership programme: the EEP programme in southern and eastern Africa started in 2010. It supports projects demonstrating high innovation in delivering energy services, facilitating technology transfer and encouraging cooperation and local stakeholders' participation, while also providing sustainable energy services to the poor and combating climate change. The overall objective of the programme is increased access to modern, affordable and reliable energy services through the increased use of renewable energy technologies. The partnership, hosted by the Development Bank of Southern Africa in South Africa, is jointly funded by the Governments of Finland and Austria, which were recently joined by the Department for International Development of the United Kingdom. The programme focuses on supporting the participation of all private, public sector and civil society stakeholders to promote partnerships between all local, regional and international stakeholders. National focal points in the relevant Government departments in the partner countries (Botswana, Kenya, Mozambique, Namibia, South Africa, Swaziland, Tanzania and Zambia) facilitate the practical engagement and participation of all stakeholders. The programme mainly uses periodic calls for proposals (at least two annually), which are open to public and private entities, research institutions, universities, and civil society organisations. The programme provides seed funding for innovative projects, in addition to the proponents' own contributions. The calls for proposals mainly focus on feasibility and pre-feasibility studies and pilot and demonstration projects.

Through supporting renewable energy technologies, the more efficient use of traditional energy sources and the adoption of innovative business models for the provision of energy services, the programme contributes to creating local employment opportunities and clean energy-based economic growth. The productive use of renewable energy services contributes to economic development and poverty reduction, especially in rural areas. Moreover, the programme contributes to addressing regional energy, poverty and security challenges. Through promoting access to sustainable, reliable and affordable energy service solutions from renewable energy the programme contributes to poverty reduction while also reducing the cost of energy and the operation of social services such as health, education and communications. As noted above, improved local economic development from the productive use of renewable energy sources contributes to poverty reduction and to the improved welfare of the poor. Overall, improved access to modern energy sources contributes to improvements in service delivery in poor communities. Furthermore, the programme promotes renewable energies and energy efficiency with the purpose of contributing to

sustainable development and the mitigation of global climate change, land degradation/ desertification, indoor and outdoor air pollution, as well as to biodiversity, the protection of wetlands and rivers and the preservation of forest. The evaluation criteria for projects for funding also consider their environmental impacts. Moreover, the promotion of renewable energy technologies, the more efficient use of traditional energy sources and the adoption of innovative business models for the provision of energy services help prevent negative environmental manifestations of the energy system such as greenhouse gas emissions and local environmental impacts.

- (5) *Working for Wetlands programme*: Working for Wetlands (WfWet) is a joint initiative of the Departments of Environmental Affairs, Agriculture, Forestry and Fisheries and Water Affairs. The programme is housed within the South African National Biodiversity Institute. The WfWet programme is based on the following key interlinked concepts that ensure effective and sustainable wetland rehabilitation:
- (i) Wetland protection, wise use and rehabilitation;
 - (ii) Skills and capacity development;
 - (iii) Cooperative governance and partnerships;
 - (iv) Research and knowledge-sharing; and
 - (v) Communications, education and public awareness.

The WfWet is designed to create employment opportunities for unemployed people, equipping them to generate income while rehabilitating and protecting wetlands. As part of its capacity-building, the WfWet programme provides vocational skills and life skills such as literacy, primary health, personal finance and HIV/Aids awareness. Field visits with decisionmakers and the distribution of resource materials are some of the methods used to influence the programme's diverse stakeholders. Although aimed at rehabilitating wetlands, the WfWet programmes address key developmental challenges such as local economic development and employment creation contributing to supporting national priorities.

F. Lessons learned, challenges and opportunities in promoting inclusive green growth in South Africa

General lessons learned

The general lessons learned from the selected case studies include the following:

The involvement of local manufacturers of green technologies such as solar heaters and component parts is critical for the promotion of local technology development and manufacturing. Through involving local actors such as businesses and civil society opportunities are created to stimulate local innovations in various IGG interventions such as solar water heaters. The spinoffs from this include an improved contribution to economic output and job creation, as well as enhanced environmental benefits for the country from the production and use of green technologies. This is also important for the sustainability of the IGG agenda.

The targeting and involvement of women and other vulnerable groups is important for IGG interventions. This is to ensure that these interventions lead to inclusive green growth it is necessary to target the involvement of vulnerable population groups benefiting from the development of whole green technology and the manufacturing value chain. For example, such beneficiaries can include women and young local start-up manufacturers who create jobs targeting vulnerable women and young people.

There is a need to institute built-in monitoring, evaluation and accountability systems. IGG interventions require the design and implementation of monitoring, evaluation and accountability systems. Systems need to be put in place to gather data that can be used to measure and evaluate the impacts of IGG interventions against defined targets. Monitoring and evaluation systems should be set up from the very beginning, together with ongoing data collection in relation to defined indicators and variables, to measure the impact of the programmes.

There is a need for increased support for capacity-building, including skills development training. Given that the lack of skills for the specialised activities required for inclusive green growth interventions is one of the factors limiting the involvement of disadvantaged groups, it is necessary to invest in capacity-building. The involvement of targeted groups in inclusive green interventions would require increased support for capacity-building targeting beneficiaries such as women, young people and their stakeholder groups.

More resources are required if South Africa is going to achieve its ambitious target of steering the economy into an inclusive green growth path. International and private sector support is critical to supplement Government resources in implementing the flagship inclusive green growth interventions recommended in governmental policy documents.

The sustainability of inclusive green growth interventions is important and needs to be built into the planning and design of IGG programmes and projects. The design and implementation of IGG programmes and projects should consider the sustainability of interventions after the initial seed funding has been spent. Demonstrating that flagship projects can sustain themselves beyond initial funding levels is key to scaling up IGG interventions and rolling out new ones across the various sectors of the economy.

Although the policies present opportunities for the country to achieve inclusive green growth, it is too early to evaluate their performance in addressing this overall objective. Furthermore, some of the commitments, especially those related to greenhouse gas emissions, are predicated on the assumption that the country will receive international support in terms of resources and technical capacity.

Green growth interventions require local communities, as final beneficiaries, to be equipped with the entrepreneurial skills necessary for the productive use of green growth technologies in income-generating activities. As local communities start to realise financial returns from using green growth technologies, they can be encouraged to save small amounts for the continuing purchase of more green growth products and services.

Pro-poor credit facilities need to be set up. When such facilities demonstrate their economic viability, financial institutions should be encouraged to provide widespread support to poor rural and marginalised urban communities which would need to access and use green growth technologies.

Challenges

The challenges that South Africa faces in advancing the inclusive green economy agenda include:

The coordination of multiple inclusive green growth interventions remains a challenge. Promoting inclusive green growth and building a green economy for South Africa requires coordinated activity to achieve the envisaged economic shifts for the transition, with the ultimate objective of a carbon-neutral economy by 2050. Interventions in various Government departments need to be coordinated to avoid duplications and to encourage synergy.

More evidence-based research about IGG opportunities is required. Evidence-based research is required to contribute to a deeper understanding of inclusive in-country green growth policy and practice. Such evidence is also required about the potential developmental and environmental impacts and challenges from IGG activities.

High unemployment and inequality, poor and highly uneven educational outcomes, and growing frustration with public service delivery failures, corruption and sluggish output growth compared to most other middle-income economies are significant concerns. The opportunities presented by IGG and the transition to an inclusive green economy need to ensure that the resultant development path addresses these immediate and pressing development concerns.

An uncertain investment climate resulting from prolonged labour conflicts, especially in the mining sector, is another concern. The risks of ongoing labour conflicts in South Africa, especially in the mining sector, negatively affect both domestic and foreign investment in the country. IGG investments could also be affected by this.

South Africa is an energy-intensive economy following an unsustainable economic development path based primarily on maximising economic growth as measured in terms of GDP, particularly through mining, manufacturing and agricultural activities. In the context of climate change, the challenge for South Africa is to develop and implement robust mitigation and adaptation measures to steer the country into an internationally competitive economic trajectory.

Efforts to promote IGG technologies in local industry face competition from other countries. Some IGG interventions being promoted in South Africa such as SWHs have a very strong local component resulting from efforts to promote the development of local industry. However, such development faces stiff competition from other countries which might have a comparative advantage in producing these interventions.

High upfront capital costs may impede the pace of adoption of some green growth initiatives. Some inclusive green growth initiatives have high upfront capital costs which are a major constraint for many poor households and small businesses with limited incomes or funding. The provision of sources of funding from Government, the private sector and donors is critical in ensuring the widespread uptake and use of inclusive green growth interventions.

Skills shortages hamper efforts to absorb the unemployed. The implementation of some IGG interventions will require new skills and competencies. However, like most other developing countries South Africa is lagging behind in identifying and nurturing these competencies and skills. This has a negative impact on the drive to create employment and to transition to an inclusive green growth agenda.

Competition for financial resources between IGG interventions and development issues facing the country is a challenge. The funding for IGG interventions is competing for limited financial resources with current developmental challenges such as service delivery. It is therefore of crucial importance for IGG interventions to significantly address these developmental challenges. A critical challenge for South Africa is to implement the various green growth recommendations from governmental policies and plans in a cost-effective manner and to ensure that greenhouse gas emission reduction targets are met, while also achieving inclusive greener growth in the country. Given global economic challenges and dwindling international donor support, the international community's failure to come forward with offers of assistance poses a threat to meeting the commitments made by South Africa.

Inclusive green growth is costly for the poor. The aggressive policies and programmes put in place by the South African Government, especially in the energy sector, present opportunities for significantly reducing the country's carbon footprint while also addressing its development challenges. However, although global demand for green growth technologies such as renewable energy technologies is increasing, these technologies are mostly still expensive for ordinary poor people in South Africa. Affordability for many poor South Africans is accordingly a critical impediment to the widespread use and adoption of some of the green growth technologies that are being promoted. It is therefore critical to ensure that affordable and cost-effective technologies are promoted, while also ensuring that a majority of the poor are able to access them.

Opportunities

Despite the challenges highlighted above, there are many opportunities for promoting IGG interventions in South Africa including:

Developmental and environmental challenges facing South Africa offer opportunities for promoting inclusive green growth and transitioning to a green economy. In order to address these challenges, the South African Government recognises the need to move away from the past unjust exploitation of resources, which excluded many communities from economic opportunities and benefits while degrading the environment, towards a more inclusive sustainable development path. There is great potential for IGG interventions to contribute significantly to addressing the country's short-term poverty alleviation and employment creation objectives while also creating a long-term, resource efficient, inclusive, low-carbon, climate-resilient and ecologically viable development pathway for the country.

The Government of South Africa is committed to contributing actively to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner. South Africa has in recent years prepared and is now implementing climate change mitigation and green economy policies and programmes as part of its efforts to steer the economy towards lowcarbon development and green economy. The country has identified key flagship mitigation programmes and has started promoting and implementing clean energy resources the Solar Water Heating Programme, the Energy Efficiency and Demand Management programme. The country has also established and the Green Fund.

Recent green economy and national development plans and policies provide the overarching national framework and enabling environment for advancing the concept of IGG in South Africa. To promote inclusive green growth and facilitate the transition to a green economy, recent national policies and plans stress the need to transform the South African economy in a way that embraces equity and sustainable development. Examples include the South African framework for responding to economic crisis, the Global Green New Deal of the United Nations Environment Programme (UNEP), the National Development Plan Vision 2030, the New Growth Path, the Green Economy Accord, and the National Strategy for Sustainable Development.

Analysis of South Africa's policy frameworks in relation to the green economy highlights broader commitment from the Government to steer the economy towards a more inclusive green growth path. Policy developments have generally witnessed an emerging trend in South Africa's national policy discourse calling for the more responsible use of natural resources and the need to 'act now' on the inclusive green growth agenda. This provides opportunities for IGG interventions to contribute to a lowcarbon and green growth trajectory and building an inclusive green economy. Given the South African Government's overall commitment to steer the economy into a low-carbon trajectory while at the same time addressing national socioeconomic development challenges, there is great potential for the programme to be replicated in other countries.

Energy efficiency is widely considered to be the most cost-effective, least polluting and readily available energy resource and the most fundamental short-term requirement for rapid, ambitious and cost-effective climate change mitigation, resource efficient and clean development. For example, energy efficiency enhances both the competitiveness of economies and poverty reduction as more energy becomes available. Moreover, productivity gains from energy efficiency are expected to reduce the cost to the economy, thus providing the opportunity to enhance the security of supply and to reduce the need to develop new sources of energy supply to serve those without access to modern energy services for health and educational enhancement, among other things.

The funding and implementation of key flagship programmes helps to demonstrate the potential and benefits of IGG. The Government, the private sector and international donors have provided funds and have started implementing key flagship IGG interventions. These projects provide practical evidence of the potential

of such interventions. Success stories about their implementation provide opportunities for scaling up their implementation while also funding new interventions.

Recommendations

Based on the case study findings, the following are recommended:

- (i) The implementation of in-country IGG interventions should be coordinated, to avoid duplication and encourage synergy.
- (ii) Government, business and other development partners should increase their support for research institutions and universities, to provide evidence-based recommendations on the developmental, economic, social and environmental impacts of IGG for South Africa.
- (iii) The implementation of IGG interventions by Government, business and other partners should address immediate and pressing developmental concerns facing the country such as unemployment, poverty and inequality.
- (iv) Government, business and labour organisations need to address labour conflicts to ensure an investment environment conducive to IGG interventions.
- (v) The implementation of IGG recommendations concerning the NDP and other strategic planning documents requires strong political commitment from Government.
- (vi) Support for key flagship programmes and projects that promote IGG and the transition to a green economy must be strengthened.
- (vii) Support for local industries should be enhanced, to strengthen competitiveness in the IGG technology market.
- (viii) Support and measures to identify and nurture the new competencies and skills required for a positive impact on job creation should be strengthened.
- (ix) Government, business and civil society organisations need to work together to promote the use and adoption of inclusive green growth interventions.
- (x) Government, business and civil society organisations should provide the majority of the poor with the means to access and build capacity for the productivity of IGG interventions.
- (xi) The dissemination and sharing of information about the successes and lessons learned from pilot IGG interventions by Government, business and civil society organisations should publicise those achievements that encourage other development partners to provide additional resources for further investments in, and replication of IGG interventions.

1. Introduction

1.1 Background

A green economy can be defined as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011). In the simplest terms, a green economy is one that combines economic and environmental outcomes or co-benefits. It is an economy whose growth in income and jobs is driven by investments that reduce carbon emissions and pollution, enhance energy and resource efficiency and prevent the loss of biodiversity and ecosystem services (UNEP, 2011). The Rio+20 outcomes identified the green economy as one of several approaches, visions, models and tools available to countries aiming to achieve sustainable development. In this regard the green economy is expected to “contribute to eradicating poverty, as well as sustained economic growth, enhancing social inclusion, improving human welfare, and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth’s ecosystem” (The Future we Want¹).

Green economy and green growth are considered twin concepts, but more and more, the development discourse has been more explicit on the “inclusive” aspects in order to highlight the equally important social dimension. Inclusive green growth is being promoted by several development agencies including the Organization for Economic Co-operation and Development, the African Development Bank and, more recently, the Economic Commission for Africa. Inclusive green growth could provide countries with an opportunity to adopt a phased approach and learn lessons to inform the design and implementation of inclusive green economy policies and strategies. The focus is on harnessing the opportunities for inclusive green growth in selected sectors of the economy facilitated by targeted investments with accompanying enabling measures. It is similar to the sectoral approach being promoted by UNEP.

“Green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our wellbeing relies” (OECD, 2011). Green growth addresses three main requirements: the inclusive economic growth needed to reduce poverty and wellbeing; improved environmental management to address resource scarcities and climate change; and equity and inclusion (OECD, 2012; World Bank, 2011). The transition to a green growth path represents a critically important means of bringing about the structural transformation needed for a more equitable and inclusive economy in South Africa (DBSA, 2011). However, the process would require activity coordinated to achieve the envisaged economic shifts to transition the country to an inclusive green growth path, with the ultimate objective of a carbon-neutral economy by 2050. This fulfils the need for evidence-based research which contributes to deepening an understanding of inclusive green growth policy and practice in South Africa.

1.2 Purpose and scope of the report

The main objective of the present report is to document good practices and lessons learned on inclusive green growth from selected case studies in South Africa. The report contributed to informing the Fifth Issue of the Sustainable Development Report on Africa (SDRA-V) produced under the theme “Achieving sustainable development in Africa through inclusive green growth.”

¹ <http://sustainabledevelopment.un.org/futurewewant.html>.

It provides an assessment of the country's experience in implementing inclusive green growth interventions. It discusses the overall policy framework and mechanisms for promoting IGG in South Africa. It also analyses selected case studies document good practices, key successes, challenges and lessons learned. The results of the analyses inform the recommendations aimed at advancing the IGG agenda in South Africa.

1.3 Methodology

The preparation of the report involved close engagements with the South African Department of Environmental Affairs. Initial engagements with the sustainable development focal point for South Africa helped identify some key sectors and interventions that were relevant for the report. The data required for the sectors under consideration were gathered through extensive literature searches and consultation with designated contacts in the relevant sectors, as well as with the Department of Environmental Affairs.

The cross-cutting issues considered in preparing the report were gender, climate change, employment (particularly for young people), and science and technology. The approach explored the sectoral linkages with climate change - both in terms of opportunities for improving South Africa's adaptive capacity and for mitigating existing and future emissions of greenhouse gases. Gender issues were considered taking into account the critical role of women in driving sustainable development in South Africa. Furthermore, the sectoral discussions took into account social issues such as equity, poverty reduction and employment generation.

1.4 Organization of the report

The report is organized as follows: Following this introductory chapter, Chapter 2 provides an overview of the macroeconomic environment, social and environmental situation and green economy in South Africa. Chapter 3 discusses policy framework to promote inclusive green growth and presents good practices in selected sectors. Chapter 4 presents general lessons learned, discusses challenges and opportunities and presents recommendations on the basis of the findings.

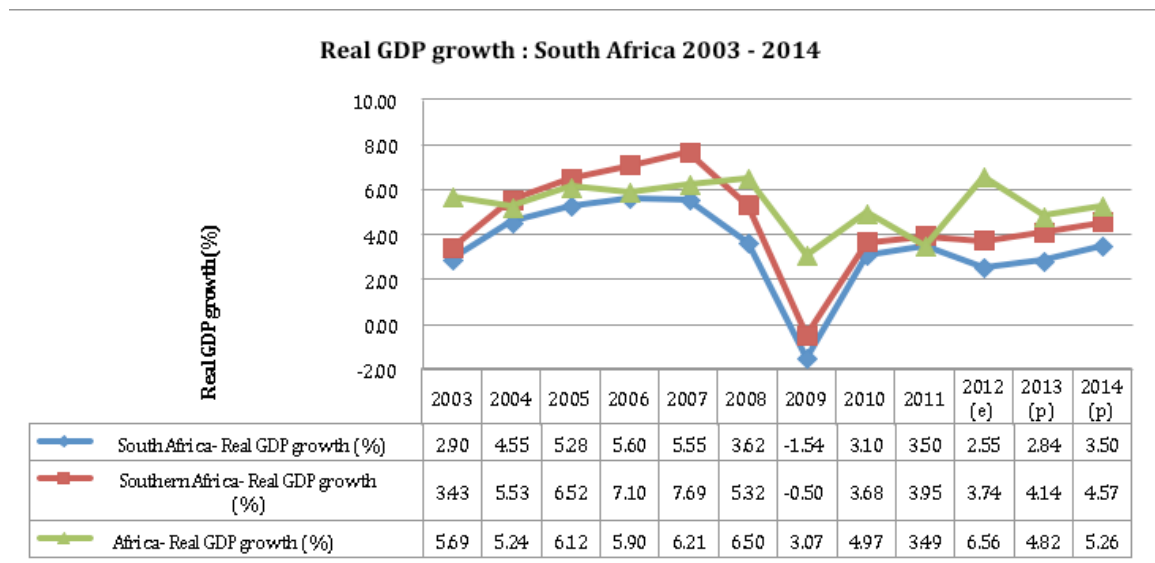
2. Macroeconomic environment, social and environmental development imperatives and green economy in South Africa

2.1 Overview of macroeconomic environment

The 2013 Economic Survey for South Africa of the Organisation for Economic Co-operation and Development argues that, despite considerable macroeconomic growth, South Africa is failing to fully achieve its considerable potential. The main reasons include high unemployment and inequality, poor and highly uneven educational outcomes, public service delivery failures, and sluggish output growth when compared to most other middle-income economies. The sustainability of economic growth is also threatened by environmental challenges such as climate change and water scarcity. Moreover, the South African economy is highly energy-intensive and its per capita carbon emissions rank among the highest in the world, comparable to those of a number of developed countries.² However, these challenges also represent opportunities for fostering IGG and building a green economy. The transition need to ensure that the resultant development path addresses immediate and pressing development concerns. It also has to meet the country's short-term poverty reduction objectives while promoting an inclusive, resource efficient, low-carbon, climate-resilient and ecologically resilient development pathway for the country.

Figure 1 and table 1 present macroeconomic indicators for South Africa. The trends show a slight increase in GDP growth from 2.9 per cent in 2003 to a peak of 5.6 per cent in 2006, dropping to a bottom low of 1.5 per cent in 2009, worsened by the 2008-2009 global economic and financial crises (figure 1). Although real GDP growth rates have increased since 2010 to a peak of 3.5 per cent in 2011, South Africa's real growth rates have remained lower than regional and continental real growth rates. Social and labour unrest, especially in the mining industry, and the euro crises negatively affected economic growth in 2012. Economic growth was expected to increase moderately to 2.8 per cent and 3.5 per cent in 2013 and 2014 due to improved global demand and macroeconomic policies (African Economic Outlook, 2013) How-

Figure 1 South Africa: real GDP growth (2003 - 2014)



Source: AfDB (2013), Statistics Department AEO. Estimates (e); projections (p).

² South Africa is ranked as the forty-second largest emitter per capita and is likely to face globally imposed emissions constraints in the near future (NPC, 2012).

Table 1 Macroeconomic indicators

Indicator	2011	2012	2013	2014
Real GDP growth	3.5	2.5	2.8	3.5
Real GDP per capita growth	2.8	2	2.3	3.1
CPI inflation	5	5.6	5.7	5.5
Budget balance as % of GDP	-4.2	-4.7	-4.5	-4
Current account as % of GDP	-3.4	-5.9	-5.6	-5.3

Source: African Economic Outlook, 2013 - OECD 2013.

ever, domestic and foreign investment in the same periods is expected to be negatively affected by risks of prolonged labour conflicts in mining and agriculture (African Economic Outlook, 2013). Inflation stayed within the 3-6 per cent target range of the South African Reserve Bank (SARB), although it briefly surpassed the upper limit (see Table 1).

Economic growth in South Africa is mainly driven by services (67 per cent in 2011) and industry (31 per cent in 2011). Agriculture constitutes less than 3 per cent of the country's GDP (table 2). Labour uncertainty in the mining industry is expected to affect this sector's contribution to national GDP.

Table 2 Socioeconomic context and characteristics of growth

Indicator	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
Real GDP, Index 1990 = 100	100.0	104.4	119.8	144.5	152.6	161.1	167.0	164.4	169.5	175.3
Agriculture, % of GDP	4.6	3.9	3.3	2.7	2.9	3.4	3.2	3.0	2.5	2.4
Industry, % of GDP	40.1	34.8	31.8	31.2	31.2	31.2	32.8	31.3	30.8	30.6
Services, % of GDP	55.3	61.3	64.9	66.2	66.0	65.4	64.0	65.7	66.7	67.0

Source: OECD: Country statistical profile - South Africa 2013.

South Africa faces triple challenges of chronic high unemployment (reported to be above 25 per cent at the end of 2012), and poverty and inequality in the face of a slow and volatile global economic environment (African Economic Outlook, 2013). The unemployment rate has been increasing in recent years (about 25 per cent in 2011) (see Table 3) with recent estimates from Statistics South Africa indicating that it has already surpassed the 25 per cent mark. National planning documents such as the National Development Plan Vision 2030 and the National Growth Path provide the roadmap to address structural bottlenecks to job creation in the country. Strong political commitment will be required to implement the recommendations of the NDP and other strategic national planning documents.

Table 3 Unemployment in South Africa

Unemployment		2004	2005	2006	2007	2008	2009	2010	2011
Unemployment rate: total labour force	%	23.00	23.50	22.10	21.00	22.93	23.93	24.90	24.90
Unemployment rate, men: male labour force	%	19.90	19.70	17.80	18.20	20.00	22.08	22.80	22.43
Unemployment rate, women: female labour force	%	26.60	27.80	27.00	24.30	26.33	26.13	27.45	27.85
Long-term unemployment: total unemployed	%	65.14	63.67	59.46	57.71	49.47	49.28	56.07	58.77

Source: OECD: Country statistical profile - South Africa 2013

Environmental situation

Based on Yale University's 2012 Environmental Performance Index (EPI) and Pilot Trend EPI that ranks 132 countries on 22 performance indicators in ten policy categories measuring environmental health and ecosystem vitality, South Africa's performance has not been very good on ecosystem vitality, although there have been signs of improvement in environmental health. South Africa is ranked among the worst performers based on EPI rank (128 out of 132 countries). Moreover, South Africa is also ranked among those whose performance is declining most in terms of Pilot Trend EPI (where it is ranked 124 out of 132 - a decline of 2.65 per cent). According to Emerson et al (2012), the worst performers in EPI rankings are countries that are water scarce and face significant sustainability challenges. Further assessment of the 2012 EPI and Pilot Trend EPI results show that, for the environmental health measure, despite an overall worse than average performance, South Africa has significantly improved its ratings since 2000 (see Figure 2) - an indication of positive policy responses.

Figure 2 South Africa: Environmental Performance Index and Pilot Trend EPI

Level of Aggregation	Performance		Performance Score with Trend Shading			Pilot Trend Results	
	Score	Rank	0	50	100	Score (-50 to 50)	Rank
Environmental Performance Index	34.5	128				-2.6	124
Environmental Health	42.5	103				7.8	94
Air (Effects on Human Health)	62.8	78				3.0	48
Environmental Burden of Disease	34.0	113				4.7	111
Water (Effects on Human Health)	39.3	86				18.9	32
Ecosystem Vitality	31.1	121				-11.2	123
Agriculture	37.0	101				-33.3	126
Air (Ecosystem Effects)	12.0	121				2.1	96
Biodiversity and Habitat	50.2	86				4.3	54
Climate Change	21.0	114				-9.6	93
Fisheries	17.5	90				-7.4	69
Forests	69.4	88				-15.3	88
Water Resources (Ecosystem Effects)	11.9	109				-44.0	109

Source: Emerson et al (2012).

South Africa has an energy-intensive economy on an unsustainable economic development path based primarily on maximising economic growth as measured in relation to GDP, particularly through mining, manufacturing and agricultural activities (DEA, 2011). The country is a major emitter of CO₂, accounting for about 65 per cent of Africa's total emissions (AUC, ECA, AfDB and UNDP, 2012). In terms of total CO₂ emissions South Africa's emissions have been increasing, from 258.4 metric tons in 1994 to 298.2 in 2000, to 330.3 in 2005, before reaching 369.4 metric tons in 2009 (see Figure 3). Most of South Africa's emissions have their source in the energy sector, mainly from liquid fuels and electricity, as well as from industry, transport and liquid fuels. In the context of climate change, the challenge for South Africa is to develop and implement robust mitigation and adaptation measures that could steer the country into an internationally competitive economic trajectory. Unfortunately, empirical evidence shows that, despite being recognised as a relatively significant contributor to global climate change, South Africa, along with other developing countries, is extremely vulnerable and exposed to the impacts of climate change and variability due to its socioeconomic and environmental context (GoSA, 2011). The adverse impacts of climate change threaten to have severe impacts on South Africa's economy, natural environment and people, and to derail development gains (Marquard, Trollip and Winkler, 2011).

The South African Government regards climate change as one of the greatest threats to sustainable development and believes that climate change, if unmitigated, has the potential to undermine or undo many of the positive advances made in meeting its own development goals. South Africa has in recent years

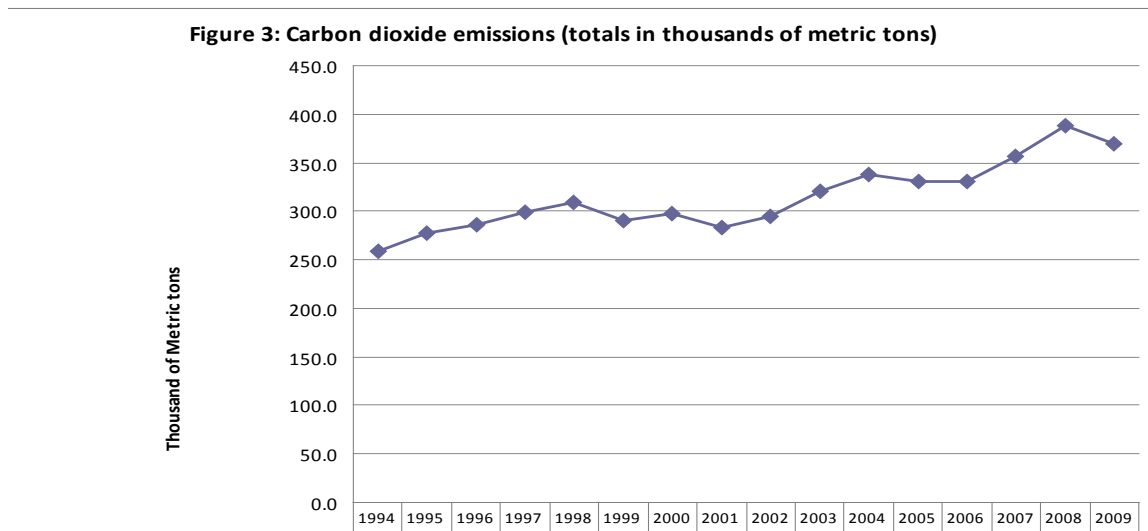
prepared and is now implementing green economy policies and programmes as part of its efforts to steer the economy into a low-carbon transition. The country has identified key flagship mitigation programmes and has started promoting and implementing clean energy resources such as the following renewable energy and energy efficient initiatives: the Solar Water Heating Programme, the Energy Efficiency and Demand Management programme, and the Green Fund.

2.2 Green economy and inclusive green growth in the context of South Africa

South Africa defines the green economy as “a sustainable development path based on addressing the interdependence between economic growth, social protection and natural ecosystem” with two inter-linked developmental outcomes for the South African economy: growing economic activity (which leads to investment, jobs and competitiveness) in the green industry sector; and a shift in the economy as a whole towards cleaner industries and sectors with a low environmental impact compared to their socioeconomic impact (Green Economy Summit Report, 2010). Moreover, on the basis of the Green Economy Accord³ signed in November 2011 by the South African Government, the business community, the trade union movement and community organisations, the green economy is considered to involve new economic opportunities and to be an important entry-point for “broad-based black economic empowerment, addressing the needs of women and youth entrepreneurs and offering opportunities for enterprises in the social economy” (DED, 2011, p. 8). The Green Economy Accord argues that promoting the green economy has the potential to create jobs on a scale estimating that, by 2020, at least 300,000 jobs can be created in the green economy and activities that green the economy.

In recent years the South African Government’s approach to the green economy and inclusive green growth has focused on the ambitious plan to transition to a low-carbon and greener economy while also addressing developmental challenges, especially job creation, poverty and inequality. The Government recognises the need to “decouple” resource depletion and environmental impacts from economic growth, severing the ties between economic activity, environmental degradation and carbon-intensive energy con-

Figure 3 Carbon dioxide emissions (totals in thousands of metric tons)



Source: IEA data.

³ The Green Economy Accord was an outcome of social dialogue on the New Growth Path between the South African Government, the business community, the trade union movement and community organisations.

sumption (NPC, 2012). Furthermore, South Africa recognises that it is a contributor to greenhouse gas emissions and is also vulnerable to the effects of climate change on health, livelihoods, water and food, with a disproportionate impact on the poor, particularly women and children (NPC, 2012; DEA, 2011). In response to these challenges, South Africa urges industries and households to reduce their negative impact on the environment (NPC, 2012). To support the development of a more sustainable society and the transition to a low-carbon economy the NDP Vision 2030 emphasises the need to invest in skills, technology and institutional capacity while developing environmentally sustainable green products and services, including renewable energy technologies, that will contribute to the creation of jobs in niche markets where South Africa has developed or can develop a competitive advantage (NPC, 2012). The aim of the NDP Vision 2030 is for the country to transition to an environmentally sustainable, climate change resilient, low-carbon economy and just society.

South Africa views a green economy as a sustainable development path based on addressing the interdependence between economic growth, social protection and the natural ecosystem (DEA, 2011). Since attaining democracy in 1994, South Africa has implemented various programmes and policies focussed on harnessing opportunities for environmental sustainability and sustainable development that also included principles of IGG in selected sectors of the economy. Furthermore, to ensure the transition to more inclusive green growth recent national policies and plans stress the need to transform the South African economy in ways that embrace equity and sustainable development. For example, the South African framework for responding to economic crisis and the Global Green New Deal of the United Nations Environment Programme (UNEP) recognise “the opportunities in the development of industries that combat the negative effects of climate change and urges South Africa to develop strong capacity in green technologies and industries” (DEA, 2010). The framework, together with many other national policy documents and plans such as the National Development Plan Vision 2030, the New Growth Path, the Green Economy Accord and the National Strategy for Sustainable Development, emphasises the need to implement pro-employment programmes promoting sustainable and inclusive growth.

The transformation of businesses and the adoption of sustainable consumption and production processes are expected to ensure growth in green sectors and more green and decent jobs, as well as reduced energy and material intensities in production processes, less waste and pollution and significantly reduced greenhouse gas emissions (DEA, 2010). Overall, the South African Government’s approach to inclusive green growth has focused on the ambitious plan to transition to a greener economy while addressing developmental challenges, especially job creation, poverty and inequality. Although there are no current statistics on the extent to which the concepts of IGG and sustainable development are understood and applied across South Africa, Government departments are being encouraged to work together in developing and implementing recommendations from national planning documents.

Furthermore, provincial and local municipalities are also being encouraged to align their programmes with national planning documents and priorities. For example, the implementation of the case studies featured in this report includes a number of departments collaborating with other stakeholders to implement selected IGG initiatives such as the IEE project and the NSWHP. Generally, the alignment of Government programmes from national departments with those of local municipalities is of central importance for the widespread understanding and implementation of IGG initiatives and policies. The critical issue is to demonstrate the potential contribution of IGG initiatives to addressing the above-mentioned pressing national developmental challenges. Further research is required in this area to clearly demonstrate both the potential of IGG initiatives in this respect and how resource allocations can be effectively used in implementing IGG initiatives addressing pressing service delivery issues.

It is important to note that, although provincial and local municipalities are expected to align their programmes with national planning documents, this implies that they will be aware of these programmes and plans as they are communicated to them. However, it should not be assumed from this that key concepts such as IGG and SD are understood and operationalized across all levels of Government. Efforts will be required to train responsible officials about these concepts and how they should be applied in a way which maximises their impact on the economic, social and environmental sectors.

3. South African policy framework and inclusive green growth case studies

3.1 Policy framework

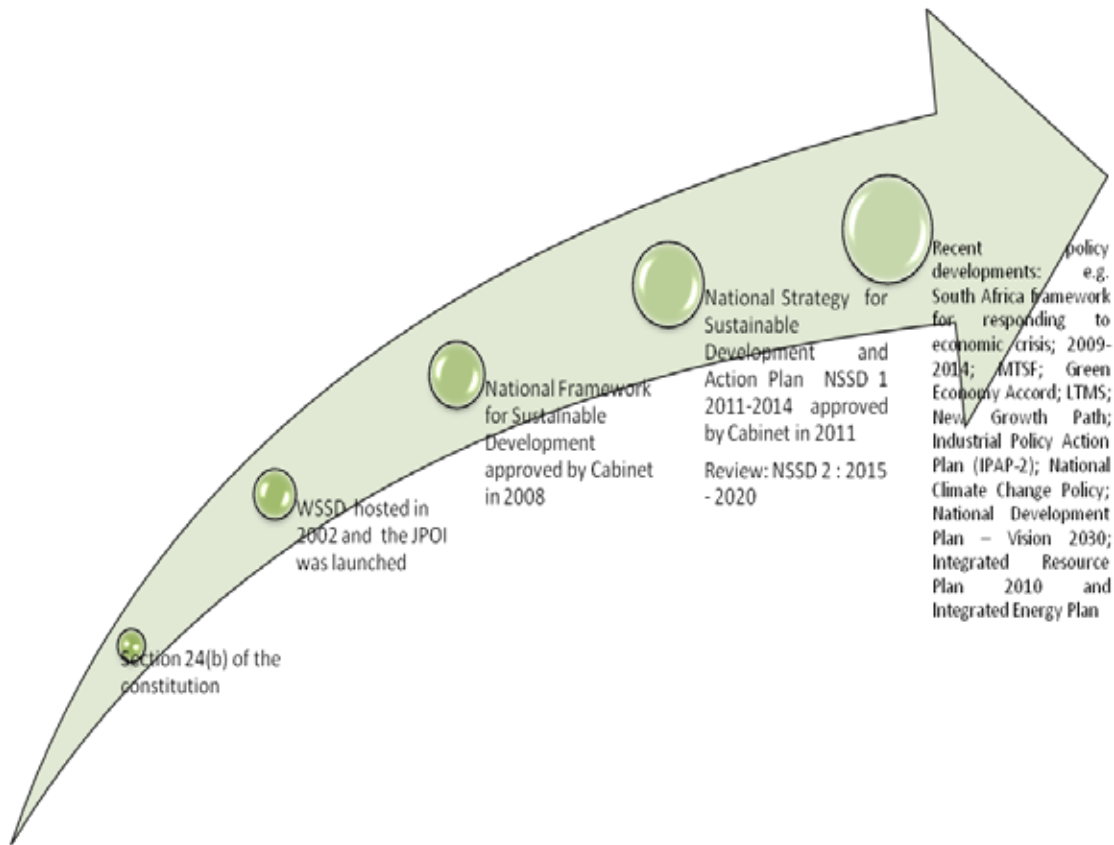
Ensuring environmental sustainability is the cornerstone of efforts to achieve sustainable development and poverty reduction. Failure to achieve stable biodiversity undermines social and economic development efforts (ECA/AUC/AfDB/UNDP-RBA, 2010, 2011; AUC, ECA, AfDB and UNDP, 2012). The South African Government embraces the urgent need to implement sustainable development initiatives addressing national challenges such as poverty, inequality and unemployment (DBSA, 2011). South Africa has adopted various initiatives aimed at promoting sustainable development. These initiatives include the Millennium Declaration, the Johannesburg Plan of Implementation and the South African Outcomes Based Approach adopted by Cabinet in January 2010 (DEA, 2011a), the National Development Plan Vision 2030, the New Growth Path, the Green Economy Accord and the National Strategy for Sustainable Development.

Figure 4 depicts the broad background to sustainability policy development for South Africa. Section 24(b) of South Africa's new constitution commits the state to "secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development". Paragraph 162 of the 2002 Johannesburg Plan of Implementation of the World Summit on Sustainable Development commits countries to "...take steps to make progress in the formulation and elaboration of national strategies for sustainable development..." (WSSD, 2003, p. 59). The Johannesburg Plan of Implementation identifies sustainability effects and outcomes in the form of implementation plans which promote the integration of the three components of sustainable development - economic and social development and environmental protection. Plans relevant to the South African context include:

- (1) Poverty reduction
- (2) Changing unsustainable patterns of consumption and production
- (3) Protecting and managing the natural resources base of economic and social development
- (4) Sustainable development in a globalizing world
- (5) Health and sustainable development
- (6) Sustainable development in Africa
- (7) Means of implementation
- (8) Institutional framework for sustainable development

To achieve the structural transformation required for a more equitable and inclusive economy, the greening of the economy is considered as a critical factor by the South African Government (DBSA, 2011). The Government recognises the need to "decouple" resource use and environmental impacts from economic growth, severing the ties between economic activity, environmental degradation and carbon-intensive energy consumption (NPC, 2012). This is seen as necessitating a move away from the past unjust exploitation of resources which excluded many communities from economic opportunities and benefits while degrading the environment.

Figure 4 Background to sustainable development in South Africa



Source: Adapted from DEA (2011b).

The Green Economy Summit held in May 2010 summarized South Africa’s understanding of the green economy as a sustainable development path based on addressing the interdependence between economic growth, social protection and natural ecosystems. To steer the economy into a green growth path in order to achieve sustainable development, South Africa has adopted a systems approach to sustainability (DEA, 2010). This approach (see Figure 5) views the economy, morality, and sociopolitical and ecosystem services as embedded within each other. They are integrated through the governance system that holds all the other systems together within a legitimate regulatory framework (DEA, 2011b). There also seems to be an understanding that addressing the tradeoffs associated with the transition to greener growth and a more environmentally sustainable economy requires the careful design and sequencing of decisions, to ensure that the decline of legacy sectors such as the generation of coalfired electricity is balanced by concurrent growth in sectors of the green economy (NPC, 2012).

Further analysis of South Africa’s policy frameworks in relation to the green economy highlights a broader commitment from Government to steer the economy into a more inclusive green growth path. For example, the country’s sustainable development vision as outlined in the National Strategy for Sustainable Development (DEA, 2011b) states that “South Africa aspires to be a sustainable, economically prosperous and self-reliant nation state that safeguards its democracy by meeting the fundamental human needs of its people, by managing its limited ecological resources responsibly for current and future generations, and by advancing efficient and effective integrated planning and governance through national, regional and global collaboration” (DEA, 2011b, p. 2). Furthermore, one of the main objectives of the NSSD focuses on the just transition towards a resource efficient and proemployment growth path.

Figure 5 South Africa's systems approach to sustainability



Source: DEA, 2011b.

Generally, policy developments have witnessed an emerging trend in South Africa's national policy discourse calling for the more responsible use of natural resources. At the United Nations Framework Convention on Climate Change (UNFCCC) COP 16 Summit, on 9 December 2010, the President of South Africa, Jacob Zuma, conditionally presented the country's position on climate change: "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". This provides opportunities for green climate change mitigation and adaptation response strategies to contribute to the transition of the economy into a green growth trajectory. Some of the motivations for South Africa to 'act now' on the inclusive green growth agenda include: pressures on key resources such as energy, water and biodiversity; the "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 (dti, 2011); and the need to decouple growth from the use of natural resources (DBSA, 2011).

3.2 Good practices in the selected sectors

For the purpose of the present report, good practices in promoting inclusive green growth in the selected sectors could be related to processes and activities conceived and implemented in a manner that has led to the expected results being achieved. Generally, good practices would include any intervention that has resulted in promoting the achievements of inclusive green growth. For the purpose of this exercise, the working definition of inclusive green growth is: *economic growth that is inclusive, creates jobs, improves human welfare (including poverty reduction), is resource efficient, enhances environmental assets, thus contributing to sustainable development*. As discussed above, the South African Government's approach to inclusive

green growth has focused on the ambitious plan to transition to a low-carbon and greener economy while addressing developmental challenges, especially job creation, poverty and inequality. Interventions to be considered could include, for instance, policies, plans, programmes and activities developed and implemented to achieve inclusive green growth; and the processes, methods, and systems adopted to develop and implement them. Another consideration could be the degree of innovation represented by the process or activity.

The six selected case studies are summarized in Table 4 and are assessed in detail in the following sections.

Table 4 Summary of selected case studies

Sector	Case Studies	Department/ Ownership	Remarks
Energy	Mass roll out of solar water heating systems	Department of Energy, Economic Development Department	Interdepartmental /Government led
	Municipal Energy Efficiency and Demand Side Management (EEDSM) programme	Department of Energy/ Eskom	Public/private partnership
	Energy and Environment Partnership Programme	Development Bank of Southern Africa	Private sector led/owned
Ecosystems goods and services	Working for Wetlands programme	Department of Environmental Affairs	Purely ecosystem/important role of wetlands
Industry and Trade	Industrial Energy Efficiency Improvement (IEE) project	National Cleaner Production Centre of South Africa	Highlights Industrial aspect
Other	The Green Fund	Department of Environmental Affairs; Development Bank of Southern Africa	Financing mechanism/enabling environment

Case 1: National Solar Water Heater Programme

Design and implementation strategy

The South African Government announced through the Department of Energy a national target of installing 1 million solar water heaters over a period of five years, by April 2015. The NSWHP was launched in April 2010 by the President of South Africa, Jacob Zuma (DOE, 2013). Under the Memorandum of Agreement signed with DOE, Eskom is the designated implementation agent and the SWH systems procurer. The National Solar Water Heater Programme (NSWHP) was allocated ZAR 4.7 billion by Government for implementation in the context of the medium-term expenditure framework.

The NSWHP participants include Government and non-governmental actors. The key players are the DOE as the funder, Eskom as the implementing agent (programme procurer) and the municipalities as the beneficiaries. The implementation of the NSWHP is supported by the Inter-departmental NSWHP Steering Committee. The non-governmental actors involved in the programme include: project management companies, locally based SWH manufacturers, and installation and maintenance enterprises (DOE, 2013). The involvement of locally based SWH manufacturers was in line with the objective of promoting local SWH technology development nationwide. Figure 6 shows an example of the SWH system.

Table 5 Medium-Term Expenditure Framework allocations 2012/13 – 2014/2015

2012	2013	2014
ZAR 1 billion	ZAR 1.7 billion	ZAR 2 billion

Source: DOE, 2013.

Figure 6 Example of solar water heating in Kuyasa low-cost housing project in Cape Town's Khayelitshatownship



Source: Department of Energy (2009)⁴.

The low-pressure SWH rebate programme has been discontinued with effect from December 2012, and has been replaced with a new SWH contracting model. This new model aims to promote local manufacturing (increasing production by about 70 per cent), and is facilitated through the Department of Trade and Industry SWH industry designation. Moreover, the new contracting model separates the supply of SWHs from their installation, thus creating an opportunity for small energy services companies to participate in the installation of SWHs (DOE, 2013). The design and implementation of the NSWHP integrate the three dimensions of sustainable development (economic, social and environmental) discussed below under economic, social and environmental impacts.

The involvement of local manufacturers of green technologies such as solar heaters and component parts is of central importance for the promotion of local technology development and manufacturing. However, the necessary policy and support structures need to be put in place to ensure that local manufacturing develops into a competitive industry. The spinoffs from this range from contributing to economic output and job creation, and contributing to national environmental benefits from the production and use of green technologies. To ensure that these interventions lead to inclusive green growth it is necessary to target the involvement of vulnerable population groups as beneficiaries in the development of whole green technology and in manufacturing value chain benefits. Such beneficiaries include women and young people who are local manufacturers; while the benefits include jobs targeted at vulnerable women and young people.

⁴ “The Kuyasa low-cost housing project in Cape Town’s Khayelitsha Township was the first project in Africa to be registered under the Clean Development Mechanism. Homes have been fitted with solar water heaters, ceiling insulation and compact fluorescent lights. Carbon credits earned by the project will be used to defray costs of the energy efficient development” (Department of Energy, 2009, p. 28).

Expected/realized outcomes and impacts

Table 6 presents a summary of expected objectives and outcomes of the NSWHP.

Table 6 Objectives and expected outcomes of the National Solar Water Heater programme

	Objective	Activities/ Interventions	Potential ¹	Outcome ²
1	Reducing electricity demand by transferring the water heating load from the grid to a renewable solar source	Facilitation of switching from electric geysers to SWHs in a high consumption domestic market	5 million high income households converted to SWHs	Reduced electricity demand in the residential segment defers power station investment
2	Mitigation of adverse climate change through an environmentally benign technology for water heating	Installation of SWHs in the low- and high-income domestic segments	9.6 million low income households who use electricity for water heating	Increased uptake of clean energy for water heating purposes
3	Cushioning the poor against rising electricity tariffs	Universal access in the domestic low income segment	4.6 million low income households who use electricity for water heating	Reduction in domestic electricity bills due to water heating being provided by SWHs
4	Facilitating the creation of a competitive and sustainable local SWH system and component manufacturing industry	Set minimum thresholds for local content through designation of the SWH industry	100% local content on tanks 100% ancillary components	SWH technology localised and imports phased out
5	Harness jobs across the SWH value chain	Localize fabrication of the SWH technology	30% manufacturing jobs; 60% installation jobs; 10% maintenance jobs	Unemployment marginally reduced in relation to the 5 million target set within the New Growth Path

Source: DOE, 2013.

According to the DOE (2013b), as of the end of January 2013 about 8,000 jobs had been created from the installation of the NSWHP. Moreover, about 33 per cent of SWHs had been installed by 31 March 2013, with the Government expecting to install about 58 per cent of the 1 million SWHs by 31 March 2014. Table 7 summarises installation and expenditure to date on the NSWHP. The target is to install 1 million SWHs by 31 March 2015.

Table 7 Status of solar water heating installations in 2012

	Quarter to Mar 2012	Quarter to June 2012	Quarter to Sep 2012	Quarter to Dec 2012
Units for quarter	28 200	34 519	17 927	23 143
Units to date	251 546	286 065	303 992	330 929
Quarterly Expenditure	ZAR129m	ZAR159m	ZAR71m	ZAR83.2m
Totals spent to date	ZAR1.2bn	ZAR1.36bn	ZAR1.44bn	ZAR1.523bn

Source: DOE (2013b).

Economic impacts

The rollout of the NSWHP has the potential to contribute in a number of ways to positive economic impacts. For example, increased demand for SWHs from high and low income households would increase their production, thus contributing to increased national output in the energy and manufacturing sectors. The programme has the potential to contribute to value addition and sectoral growth through the creation of a competitive and sustainable local SWH system and components manufacturing industry. This can also be a source of export revenue through exports to the Southern African region and other parts of the world. Increased demand in both South Africa and the Southern African region has the potential for clean energy sectoral growth and linkages with other sectors such as the components manufacturing industry and engineering enterprises. The localisation of SWH technology and the phasing out of imports are expected to contribute to improved local production and national output.

Social impacts

The positive social impacts of the programme include harnessing jobs across the SWH value chain and cushioning the poor against rising electricity tariffs. The NSWHP is expected to achieve universal access in the domestic low income segment, contributing to reducing domestic electricity bills because water heating is being provided by SWHs. This provides the poor and vulnerable with improved access to energy resources, and contributes to increasing their disposable incomes through income savings from SWHs.

Environmental impacts

The NSWHP is expected to contribute to environmental benefits for the country. South Africa has undertaken to contribute to reducing greenhouse gas emissions. The implementation of the programme is one of the interventions contributing to that goal. For example, the NSWHP is expected to reduce electricity demand by transferring the water heating load from the grid to a renewable solar source. The reduced demand for electricity in the residential segment defers investment in power stations. Moreover, the programme contributes to the national aim of mitigating adverse climate change through an environmentally benign technology for water heating.⁵

Enabling measures

Financial resources have been provided by Government through the SWH rebate programme managed by Eskom to roll out the NSWHP. Moreover, an SWH programme funded by Treasury through a Division of Revenue Act allocation is currently being rolled out in various municipalities (for example, in the city of Tshwane and the municipalities of Sol Plaatje and Naledi, South Africa). The private sector, in the form of commercial banks, insurance companies and donors, is complementing Government efforts to create a robust and self-supporting national SWH industry by supporting and driving SWH initiatives in various parts of the country (DOE, 2013). To address the high upfront capital costs of SWH systems, the DoE in 2013 announced a standard offer incentive scheme that would fund all Energy Efficiency and Demand Side Management interventions including SWH technologies.

Cross-cutting issues

Science and technology

The NSWHP encourages the use of local resources and technologies facilitated by the DOE through the Memorandum of Agreement with Eskom and the new contracting model for the programme. The new contracting model includes product specifications and local content (taking its cue from its SWH industry designation status under the provisions of the Preferential Procurement Policy Framework Act,

⁵ “Installation of 1 million SWHs would result in avoiding carbon emissions of 20 tons of CO₂ per unit over a 10 year period, with all the units saving 20 million tons. Based on an average selling price of R100 per ton of CO₂, this would yield a total foreign currency inflow of R2 billion over 10 years. The total emissions reduction of 20 million tons is equivalent to 5% of South Africa’s annual emissions. The programme would therefore contribute to meeting South Africa’s emissions reductions and renewable energy targets” (Department of Energy, 2009, p. 28).

2000 (Act No. 05 of 2000)). The new contracting model aims to facilitate the local production of SWH technology (thus reducing overdependence on imports) (DOE, 2013) and facilitating the creation of a competitive and sustainable local SWH system and components manufacturing industry. Moreover, the programme's new contracting model integrates the skills development aspects of the programme. Chronic skills shortages in various fields and the SWH industry are acknowledged, with measures having been put in place to address this challenge. For example, the Department of Public Enterprises, Eskom, the Development Bank of South Africa, the Swiss Agency for Development and Cooperation, and others have invested in increasing the workforce of qualified and solar competent plumbers and hot water installers (National Qualifications Framework, levels 2 and 4 respectively) (DOE, 2013a). The skills development aspects are designed as an opportunity to train and certify more people, particularly within beneficiary communities, improving the skills base and employability of young men and women South Africans who are currently unemployed (DOE, 2013a).

Climate change

The NSWHP integrates the mitigation of adverse climate change through environmentally benign solar technology for water heating. The programme supports the increased uptake of clean energy for water heating purposes, clearly contributing to a number of initiatives being implemented by the South African Government and various partners to support South Africa's commitment to transition to a low-carbon economy. According to the Department of Energy in 2013 the programme has the potential to reach the 9.6 million low income households which use electricity for water heating. However, the amount of energy savings still needs to be monitored and verified to provide concrete conclusions on the contributions of the programme. As indicated earlier, this can provide important information for carbon trading in carbon markets.

Gender

The NSWHP programme aims to cushion the poor against rising electricity tariffs (about 4.6 million low income households use electricity for water heating). This forms part of Government efforts to address the poverty and inequality that are critical challenges facing the country. Although no relevant data has been gathered for this report, the programme prioritises poor households, including those headed by women, as beneficiaries of the programme. Moreover, young men and women South Africans who are currently unemployed are targeted for the programme's skills development activities. However, data from the programme would be a precondition for a clear assessment of women's involvement.

Sustainability and replicability

Despite current low levels of achievement in implementing the NSWHP, the recent national policy changes elaborated on above provide a national framework for the transition to environmentally friendly resources such as solar energy. These policy frameworks, together with awareness and educational campaigns and capacity-building activities on solar energy, provide the framework for supporting the programme's sustainability beyond the initial implementation phase. Recent evidence shows that many households outside the programme are already opting for solar water heating systems to reduce increasing energy costs. Support for the creation of a competitive and sustainable local SWH system and components manufacturing industry will also contribute to the sustainability of the programme beyond its initial funding.

Given the potential socioeconomic and environmental benefits from the use of solar water heating programmes, there is potential for other countries, especially in Southern Africa, to adopt the programme. For example, given the energy challenges in most countries of the region, the solar water heating programme provides most households with alternative energy outside the grid. However, there is a need to support the poor who cannot afford to buy energy at market prices to access the required technology, while also providing incentive schemes promoting widespread uptake. Implementing built-in monitoring and evaluation systems is important for the provision of ongoing data on the socioeconomic and environmental attainments of such initiatives.

Lessons learned

The implementation rate of the NSWHP has been slower than expected. Although Government remains optimistic about achieving the targets for the NSWHP, the programme's rate of implementation has been very slow, posing some questions about its design and implementation. Experiences of the programme show that issues such as financing, including affordability and the acceptance of technology among the poor households targeted by the programme require in-depth consideration at the design stage.

The mobilisation and allocation of adequate and sustainable finance is important. The implementation of the programme has experienced financing challenges threatening the achievement of the Government's target of installing 1 million SWHs in five years (DOE, 2013). Despite financing challenges, the South African Government has remained committed to the NSWHP, with the Minister of Finance announcing during the 2012 budget speech that: "The levy on electricity generated from non-renewable sources will increase by 1c/kWh as from 1 July 2012 and will replace the current funding mechanism for energy efficiency initiatives such as the solar water geyser programme. An additional R4.7 billion is allocated to complete the installation of one million solar water geysers." Furthermore, to address the financing challenges, the South African Government intervened with some policy measures. For example, funding for the NSWHP was later enabled through Schedule 2 of the Appropriation Act, 2012 (Act No. 7 of 2012). Moreover, the DOE and Eskom signed a Memorandum of Agreement (MoA) in November 2011, to facilitate funding for the implementation of the national SWH rollout. Through the MoA, the Government allocated a conditional grant of ZAR4.7 billion to Eskom for completing the installation of one million solar water heaters. From this experience, an important lesson is that sufficient financial resources must be available to ensure the successful implementation of inclusive green growth technologies and interventions.

The involvement of local manufacturers of green technologies such as solar heaters and component parts is critical to promoting local technology development and manufacturing. The involvement of locally based SWH manufacturers is vital for the promotion of local SWH technology development nationwide. A thriving locally based SWH industry will also help create more local jobs, while providing support services for SWH systems beneficiaries. Through involving local actors such as businesses and civil society opportunities are created to stimulate local innovations in various IGG interventions such as SWHs. The spinoffs include their contribution to national economic output, job creation and environmental benefits through the production and use of green technologies. This is also important for the sustainability of the IGG agenda.

Need to establish built-in monitoring, evaluation and accountability systems. In providing evidence to the Auditor General, Parliamentary Committees, and other agencies the DOE has not been able to verify the number of reported installations posing serious problems (DOE, 2013). To address this challenge, the DOE plans to institute a standardised programme monitoring approach. For example, the DOE is considering reconfiguring all of the programme's minimum reporting requirements to require geographical mapping through geographical information system coordinates and a photographic record of each installed system (DOE, 2013). Despite commitments made by Government, a functioning NSWHP monitoring and evaluation system was not in place from the very beginning. Systems are now being put in place to gather data that can be used to measure and evaluate the impact of the programme from the points of view of the electricity supply system and its socioeconomic impact. The measurement and evaluation systems should have been set up from the very beginning. Ongoing collection of data about the programme should have been in place at that initial stage.

Furthermore, savings in terms of energy and other environmental benefits are still to be fully implemented to provide measurement and verification data from the programme. Currently there is no measurement and verification of energy savings from the NSWHP. Proposals are in place to have the programme measured and verified in accordance with SANS 50010 by an independent M and V professional in order to increase the independence and credibility of the M and V function. Moreover, M and V data can be used to sell carbon credits under the clean development mechanism. However, this process requires proof of carbon savings methodologies that go beyond concepts of saving perceived as simple by a very large population of participating carbon-based energy users (DOE, 2013).

It is important to carry out widespread awareness-raising campaigns on the need and importance of solar water heating systems to fulfil the socioeconomic needs of households and to provide environmental benefits. Such campaigns are vital in promoting the widespread adoption of the technology by Government beyond the initial phase of the programme. For example, energy efficiency and demand side management projects such as the SWH programme help achieve energy consumption and energy demand savings by users. Eskom and the Department of Energy have these campaigns in place; these efforts need to be maintained to ensure the sustainability of the programme when Government funding is no longer available.

Experience of the NSWHP shows that ensuring a supportive policy environment and creating a competitive and sustainable local SWH system and components manufacturing industry will contribute to the sustainability of the programme beyond its initial funding. Moreover, educational and capacity-building activities are critical for increasing technical capacity in providing SWH system services for small businesses and for the widespread updating and use of SWH systems beyond the targeted communities. This could be taken up beyond South Africa, in the Southern African region and in other parts of Africa.

Lessons learned

- (i) There is a need for collaboration among various stakeholders to bring resources together for investments in inclusive green growth interventions;
- (ii) Built-in monitoring, evaluation and accountability systems need to be designed within inclusive green growth interventions, to ensure that contributions to economic, social and environmental benefits and costs are monitored and evaluated against defined objectives;
- (iii) Capacity-building and awareness-raising are critical to support local manufacturing, as is improving knowledge and awareness of the need and importance of inclusive green growth technologies such as solar water heating systems; and
- (iv) Since most green growth technologies might not be accessible to many of the vulnerable groups, especially the poor, due to affordability and other factors, it is critical to ensure that the implementation of these interventions targets these vulnerable groups throughout the whole value chain of the technologies.

Case 2: Municipal Energy Efficiency and Demand Side Management programme

Design and implementation strategy

Energy efficiency is widely considered as the most cost-effective, least polluting and readily available energy resource and the most fundamental short-term requirement for rapid, ambitious and cost-effective climate change mitigation (DOE, 2012a). In 2005 the South African Government published the National Energy Efficiency Strategy that set a target of 12 per cent energy demand reduction by 2015 - based on sectoral targets for the residential sector (10 per cent), industrial and mining sectors (15 per cent), commercial and public buildings (15 per cent), power generation (15 per cent) and transport (9 per cent). Furthermore, the DOE's approved 2012 strategic plan for the three-year period ending in 2015 requires national energy savings of 20 TWh from implemented EEDSM measures across all sectors, including the public sector.

Against this background, the South African Government, through the Department of Energy, has embarked on a process of developing and implementing the national energy efficiency strategy, energy efficiency tax incentive schemes, energy management systems and standards, and the energy efficiency monitoring system (DOE, 2012a). The municipal Energy Efficiency and Demand Side Management (EEDSM) programme is one of the energy efficiency improvement programmes that have been implemented in addition to the public building energy efficiency programme, the industrial energy efficiency programme, and other private sector initiatives.

The programme is supported by three main partners: the DOE, the National Treasury and the German Society for International Cooperation, Ltd (GIZ). Other key stakeholders involved in the implementation of the programme include: municipalities, South African local government, the city energy support unit and the South African cities networks. Stakeholder engagement for the programme is through a series of technical workshops, seminars and meetings (DOE, 2012). The programme partners meet regularly, at least monthly, to make decisions, to oversee programme implementation and monitoring, to discuss its strategic direction and to ensure that work is managed in a manner that will achieve the intended outcomes and will be consistent with the contract signed between the DOE and the municipalities. The programme management team reports to the Chief Director of Clean Energy, and consists of representatives of the DOE, the German Society for International Cooperation, Ltd (GIZ), the city energy support unit, South African cities networks, and SALGA's Deputy Director of Energy Efficiency, as programme manager (DOE, 2012).

The EEDSM programme has been allocated ZAR600 million in the MTEF (ZAR200 million for each financial year from 2012/13 to 2014/15).

Table 8 Roles and responsibilities of government partners involved in Energy Efficiency and Demand Side Management programme

No.	Organisation		
	Municipality	Department of Energy	National Treasury
1	Prepare an energy efficiency project plan based on the findings of the energy audits	Development of EEDSM framework	Confirmation of EEDSM funds
2	Implementation of energy efficiency measures	Selection of municipalities to participate in the EEDSM programme	Approval of the payment schedule
3	Promotion of energy efficiency and demand side measures	Allocation and transfer of funds to participating municipalities based on the approved energy efficiency projects	Approval of the monthly, quarterly and annual performance reports from the Department of Energy
4	Measurement and verification of energy savings	Monitoring and evaluation of implementation progress	
5	Monthly, quarterly and annual reporting of the energy savings and expenditure to the Department of Energy and the National Treasury	Approval of reports from municipalities and reporting of overall project expenditure to the National Treasury	

Table 9 summarises energy efficiency project activities by municipalities under the EEDSM programme.

Table 9 Summary of Energy Efficiency and Demand Side Management projects

No.	Project	Activities
1	Retrofits of street lights	Mapping of existing street light infrastructure
		Conduct of technical energy audits to determine basic energy usage
		Determine current and projected electricity consumption
		Compiling an inventory of public street lighting infrastructure and lighting types
		Monitoring of electricity consumption post-retrofitting
2	Traffic signals	Mapping of existing traffic signals and intersections
		Conduct of technical energy audits
		Determine current and projected electricity consumption of traffic signals
		Compilation of an inventory for traffic signals
		Monitoring of electricity consumption post-retrofitting
3	Municipal buildings	Conducting of technical energy audits
		Determine electricity consumption
		Compilation of inventory for building lights
		Monitoring of electricity consumption post-retrofitting
4	Water pumping and waste water treatment	Mapping of water pumping and waste water treatment
		Conducting of technical energy audits
		Determine electricity consumption
		Monitoring of electricity consumption post-retrofitting
5	Capacity-building and training	Develop capacity-building and training plan for local technicians
		Create a database of trained technicians or participants
6	Energy efficiency awareness	Develop a municipal energy efficiency awareness plan
		Design and print energy efficiency messages in local/regional newspapers, municipal newsletters, electricity bills
		Conduct workshops/seminars on energy efficiency and demand side management
		Conduct live energy efficiency discussions in local/regional newspapers
7	Monitoring, reporting and verification of the retrofits and energy savings	Determination of electricity consumption post-retrofits to be conducted by municipalities
		Quantification of energy savings by municipalities
		Compilation of monthly, quarterly and annual performance reports to report implementation progress
		Quality control and assurance through routine inspections by the Department

Figure 7 is a map featuring the 28 municipalities participating in the EEDSM programme.

Figure 7 Map featuring the 28 municipalities participating in Energy Efficiency and Demand Side Management programme



Source:DOE (2012).

Expected/realized outcomes and impacts

The expected outcomes of the EEDSM programme are to assist municipalities to reduce their electricity bills by optimizing energy use, improving delivery of services, reducing greenhouse gas emissions, and by undertaking the retrofitting of existing facilities such as street lighting, traffic signals, municipal buildings, water pumping and waste water treatment. This is based on factors impacting decisively on effective municipal administration such as rising energy prices, increase in population, increased energy consumption, increased greenhouse gas emissions and increased demand for water supply (DOE, 2012). Table 10 summarizes the achievements of the EEDSM programme.

As indicated in table 5, the EEDSM programme is expected to deliver economic, social and environmental benefits for the country. For example, investments in the programme would contribute to economic output in a number of sectors such as water and waste, building and construction and energy. Targeted job creation for men, women and young people (see Table 10) would also ensure that all segments of society are engaged in and benefit from the programme. Overall, the programme is expected to contribute to power savings and emissions reductions. This forms part of the energy efficiency programmes being implemented by South Africa to address its high energy intensive use.

Table 10 Energy Efficiency and Demand Side Management 2012/2013 - programme summary project sheet

Participating municipalities	
Number of participating municipalities	28
Participating metropolitan municipalities (population of 500,000 and more)	9
Participating secondary municipalities	14
Participating primary municipalities (population less than 100,000)	5
Provinces covered by EEDSM 2012/2013	9 out of 9
Population covered by EEDSM 2012/2013	18 612 434
Average size of participating municipalities (in terms of population)	664 730
Project managers appointed	28
Budgets and contracts	
Total (original) budget in ZAR	226 000 000
Total (reallocated) budget in ZAR	193 999 800
Average (reallocated) budget per municipality in ZAR	6 928 564
Average (reallocated) budget per inhabitant in ZAR	10.42
Contracts sent to municipalities	31
Contracts signed	28
Power savings and emissions	
Planned savings in MWh/a	31 349
Planned savings in MW	6.83598
Planned emissions avoided in tons of CO ₂ per annum	4 231
Planned jobs for men created by programme	393
Planned jobs for women created by programme	284
Planned jobs for young people created by programme	1 186
Energy savings	
Total planned total energy cost savings in ZAR per annum	36 700 748
MW savings planned per million ZAR investment costs	0.055
MWh/a savings planned per million ZAR investment costs	277.9
Planned jobs to be created per million ZAR investment costs	5.80
Planned simple payback period in years (average)	4.0

Source: DOE (2012).

Economic impacts

The economic impacts of energy efficiency include the enhanced competitiveness of economies and poverty reduction as more energy becomes available. Moreover, productivity gains from energy efficiency are expected to reduce the cost to the economy, while enhancing supply security and reducing the need to develop new sources of energy supply to serve those without access to modern energy services for health and educational enhancement, among other things. Furthermore, attractive green jobs and businesses can be created from accelerated energy efficiency programmes (DOE, 2012a). The EESDM programme also contributes to maintaining the international competitiveness of local industries through the uptake of efficient technologies. According to Eskom (2010) demand side management (DSM) is often the least cost-efficient method of creating an additional energy supply, that is, the cost of building new capacity to generate 1Mwh can greatly exceed the cost of funding DSM programmes to conserve the same amount of energy. Effective DSM measures can generally reduce the overall cost of electricity supply.

Social impacts

The positive social impacts of the EEDSM programme include enhanced access to modern energy services for the poor who might otherwise not have access and who can benefit from increased supply as a result of improved efficiency. Improved energy access is expected to contribute to social benefits that include enhanced health and education for local communities. Moreover, employment opportunities are positive spin-offs from implementing energy efficiency interventions.

Environmental impacts

By promoting energy efficiency, the EEDSM programme contributes to meeting the country's environmental goals in relation to climate change and the reduction of carbon emissions. Reduced demand for more new energy through improved energy efficiency would also help prolong the life of finite non-renewable energy resources. Energy savings are expected to contribute to emissions reductions for the country.

Enabling measures

Through the DOE the Government has published supporting policy and strategies to facilitate the implementation of energy efficiency programmes such as the 2005 national energy efficiency strategy and the 2012 Department of Energy Strategic Plan. To support these policy frameworks, Government departments, Eskom, the private sector and donors are providing resources aimed at supporting energy efficiency projects that will contribute to the attainment of energy efficiency targets.

Cross-cutting issues

Science and technology

The EEDSM programme promotes the development of energy efficient technologies that will contribute to the development of the science and technology sector, to support growing demand. Moreover, increasing demand also leads to growth in science and technology training in energy efficiency.

Climate change

By helping municipalities to retrofit existing facilities such as street lighting, traffic signals, municipal buildings, water pumping and waste water treatment, the EEDSM programme integrates improved energy use and contributes to GHG emissions reduction. By promoting improved energy efficiency the programme contributes to reduced demand for additional energy supply. This contributes to South Africa's drive to reduce emissions.

Gender

Gender issues in the EEDSM programme are addressed through stakeholder engagements and the targeted employment of women and young people, as discussed above. The involvement of local government and stakeholders in targeting these groups ensures that the programme includes disadvantaged groups in the community.

Sustainability and replicability

The EEDSM programme is improving the delivery of services such as street lighting, traffic signals, municipal buildings, water pumping and waste water treatment, and provides an excellent opportunity for sustainability beyond initial funding by the programme. Although it is too early to be sure of outcomes, demonstrated success will be important in providing a framework for the sustained use and adoption of the programme's principles. Moreover, the policy framework for South Africa on improving energy efficiency and contributing to emissions reductions provides a basis for continuing investments in the programme in other parts of the country. The multiple benefits of the programme, including improved energy use and service delivery, and its contribution to GHG emissions reduction, are key drivers promoting the replication of the programme, not only in South Africa, but also in other countries.

Lessons learned

Energy efficiency saves resources and improves service delivery. Municipal energy efficiency provides an important way of saving energy and resources and also ensures improved access to electricity, water, heat and air conditioning for local populations (DOE, 2012). Through the energy efficiency programme municipalities are able to save substantial amounts of resources that are currently used to purchase energy for providing local public services such as street lighting, traffic signals, office building lighting, water pumping and waste water treatment facilities.

Guidelines on monitoring, reporting, measurement and verification should be an integral part of the programme. The programme includes a plan for monitoring, reporting, measuring and verifying options defined in the South African Standard (SANS 50010) for the measurement and verification of energy savings (DOE, 2012). Ensuring that a monitoring, reporting, measurement and verification plan is in place is very important for the programme.

The monitoring and quantification of energy savings remains a challenge. According to the DOE (2013a), although various energy efficiency measures have been implemented since 2005, the monitoring and quantification of energy savings has been a challenge. An important lesson for the programme is to ensure that monitoring and verification processes are implemented to address these challenges and build a database of energy savings, among other benefits.

Involvement of international organisations in design, implementation, monitoring and evaluation plays an important role in the success of the programme. In accordance with article 4.7 of the United Nations Framework Convention on Climate Change, the extent to which this outcome can be achieved depends on the extent to which developed countries meet their commitment to provide financial, capacitybuilding, technology development and transfer support to developing countries. Therefore, collaboration with international partners such as the German Society for International Cooperation, Ltd in this case provides South Africa with that critical financial capacity-building, technology development and transfer support.

Capacity-building is needed. The involvement of targeted groups in inclusive green interventions such as the EEDSM programme requires capacity-building for targeted beneficiaries such as women, young people and their stakeholder groups. Because the lack of skills for specialised activities required for inclusive green growth interventions is a limiting factor for the involvement of disadvantaged groups, it is necessary to invest in capacity-building.

EEDSM offers the least costly method of creating an additional energy supply. Effective DSM measures help reduce the demand for additional energy supply, thus contributing to improving energy reserves and supply. According to Eskom (2010) energy efficiency measures are a more cost-effective and reliable means of supply than renewable energy technologies.

Energy efficiency contributes to reducing emissions and attaining other environmental goals. Promoting energy efficiency contributes to long-term plans for meeting emission reductions and addressing climate change in South Africa. Reduced demand for more new energy through improved energy efficiency would also help to reduce demand for coal-based energy for the country, while also prolonging the life of finite non-renewable energy resources.

Behavioural change is important for the widespread use and adoption of the EEDSM. Mobilising consumers and businesses to adopt an energy culture would contribute to the sustainable use of available energy and also to widespread commitment to energy savings through the adoption of energy efficient technologies and EEDSM in general. This will contribute to addressing complex energy demand issues for a sustainable future for South Africa.

Case 3: The Green Fund

Design and implementation strategy

The Government of South Africa, through the Department of Environmental Affairs, has made available ZAR 1.1 billion over three years to initiate a Green Fund. The fund aims to facilitate investment in green initiatives to transition South Africa to a greener economy and to support socioeconomic development. The Green Fund is a collaboration between the Development Bank of Southern Africa, as the implementing agent of the Green Fund, and the Department of Environmental Affairs (DEA, 2013).

The management of and decisions on applications made to the Green Fund are made by the Green Fund Management Committee consisting of representatives of the DEA, the DBSA and the National Treasury. The Green Fund is designed to support innovative initiatives which would not have been implemented without its support. Moreover, the Green Fund provides additional resources to complement existing Treasury allocations designed to facilitate the South African economy's transition to a low-carbon, resource efficient and climate-resilient growth path (Green Fund, 2013; DEA and DBSA, 2012). Legal and policy documents supporting South Africa's transition to a green economy include: the National Climate Change Response White Paper; the National Development Plan Vision for 2030; the National Planning Commission's Diagnostic Report; South Africa New Growth Path Framework; the South Africa Integrated Resource Plan 2010-30; and South Africa's Industrial Policy Action Plan 2012/13.

In terms of supporting inclusive green growth in the country, the Green Fund is designed to:

- (i) Deliver positive environmental, economic and social returns;
- (ii) Promote innovative and high impact green programmes through catalytic finance that enables them to scale up and eventually be replicated elsewhere in the country;
- (iii) Strengthen capacity to mainstream green and climate issues into the South African economy and society;
- (iv) Build an evidence base of projects to inform future green programmes; and
- (v) Attract additional resources through leveraging and blending financial and other resources (DEA and DBSA, 2012).

The Green Fund has identified three thematic funding windows which will contribute to the transition to green economy (see Table 11).

Table 11 Thematic funding windows of the Green Fund

Thematic funding window	Description and vision	Focus area
Green cities and towns	The vision of the green cities and towns window is to strive for well-run, compact and efficient cities and towns that deliver essential services to their residents, utilising available natural resources efficiently and sustainably.	Sustainable transport Sustainable waste management and recycling Renewable energy, including off grid and mini grid Sustainable water management Energy efficiency and demand side management Sustainable human settlements, built environment and green buildings Ecosystem services
Low-carbon economy	<p>The decoupling of economic growth from its impact on natural resources will be driven by private sector efforts to lower environmental impact and resource consumption. This can be achieved through clean production methods and other climate change mitigation and adaptation measures. These include interventions targeting industrial efficiency and the carbon intensity of the economy including energy efficiency, reducing pollution from industrial processes, waste management and reuse of by-products.</p> <p>The vision of the low-carbon economy window is to strive towards a lowcarbon growth trajectory in line with national climate change policy principles.</p>	Energy efficiency Renewable energy (solar, wind, biogas, biomass, landfill gas, mini / small hydro), excluding the renewable energy independent power producer procurement programme under the Department of Energy Rural energy including off grid and mini grid Biofuels Sustainable transport Industrial cleaner production and consumption projects
Environmental and natural resource management	<p>The protection of biodiversity and securing the sustainable delivery of ecosystem services are the primary focuses of this funding window. These include interventions targeting ecosystem-based adaptation to climate change that could drive rural development models. Managing and reducing the impact of agriculture and land use changes through demand management and resource conservation will be supported.</p> <p>The vision of the environmental and natural resource management window is to strive for protected and conserved resources for sustained ecosystem services to support South Africa's development path.</p>	Payment for ecosystem services projects Biodiversity benefiting businesses, including sustainable farming Sustainable land use management and models Rural adaptation projects and plans

Sources: DEA and DBSA, (2012).Green Fund Application Guidelines, DEA, Pretoria, South Africa.

Expected/realized outcomes and impacts

The Green Fund aims to provide catalytic finance to facilitate investment in green initiatives supporting poverty reduction and job creation. The Green Fund is designed as an additional resource to complement existing Treasury allocations supporting the transitioning of the South African economy to a low-carbon, resource efficient and climateresilient growth path. Moreover, the Green Fund is designed to respond to market weaknesses that are currently hampering South Africa's transition to a green economy by:

- (i) Promoting innovative and high impact green programmes and projects;
- (ii) Reinforcing climate policy objectives through green interventions;
- (iii) Building an evidence base for the expansion of the green economy; and
- (iv) Attracting additional resources to support South Africa's development of a green economy.

As of 2013, the Green Fund has issued two requests for proposals: the first request for proposals considered applications centred on project development and implementation; the second request for proposals, which closed in March 2013, focused on applications aimed at conducting research on topics advancing the green economy in South Africa (Green Fund, 2013). In response to its first call for applications for funding the Green Fund received a total of 590 proposals totalling ZAR10.9 billion. The proposals came from non-profit organisations, the private sector and Government departments across all provinces of South Africa.

Economic impacts

Through providing funding for the implementation of innovative green growth interventions the Green Fund contributes to economic growth, job creation and reducing carbon dioxide emissions. The Green Fund forms part of the implementation process of green growth recommendations from various Government plans such as the Green Accord, the NGP, the NDP and the NSSD. The implementation of the various projects supported by the Green Fund would contribute to improved economic output and productivity for South Africa.

Social impacts

Through funding green growth interventions the Green Fund contributes to the Government goal of creating green jobs while at the same time steering the economy into a green growth path. Furthermore, the projects supported by the Green Fund contribute to addressing energy access challenges, especially among the poor. Therefore, through improved access to and the productive use of new clean energy sources, Green Fund projects enhance the health, education and social wellbeing of poor communities and of the country at large.

Environmental impacts

Providing the resources and an enabling environment for the implementation of green growth interventions is critical for achieving Government targets of addressing environmental challenges such as climate change, while at the same time reducing developmental challenges facing the country such as poverty and unemployment. IGG intervention supported by the Green Fund contributes to the attainment of environmental targets for the country, including reducing emissions.

Enabling measures

The Green Fund is supported by a very strong institutional and policy framework aimed at promoting green growth nationwide. Examples of the policies and programmes include: the Green Accord, the NGP, the NDP and the NSSD. Through the Department of Environmental Affairs the Government has made available ZAR1.1 billion over three years to initiate the fund.

Cross-cutting issues

Science and technology

As a national fund, the Green Fund only accepts applications for South African-based projects and therefore largely supports the use and valorisation of local resources and technologies. The Green Fund is designed to provide both support and an enabling environment facilitating investments in green initiatives supporting South Africa's transition to a green growth path through catalytic finance enabling such investments to scale up and eventually be replicated elsewhere in the country. This provides opportunities for implementing adaptation and mitigation actions contributing to the delivery of high impact economic, environmental and social benefits for the country.

Climate change

One of the thematic funding windows of the Green Fund is focused on the low-carbon economy. This is in line with the national climate change policy principles for South Africa. Projects supported by the Green Fund under this window contribute directly to national objectives of reducing emissions and steering the country towards a low-carbon economy. Moreover, the other funding windows (green cities and towns, and environmental and natural resource management – see Table 8) contribute to promoting environmental goals for the country which also support the drive to reduce emissions.

Gender

The Green Fund beneficiaries of research and development grants include research institutes, universities, private companies, Government-affiliated institutions and entities and non-profit organisations. Although these institutions have preferential employment equity plans, it is critical that projects applying for funding highlight disadvantaged groups such as women and young people, to ensure their involvement.

Sustainability and replicability

The Green Fund is designed to support recommendations from legal and policy documents supporting South Africa's transition to a green economy, including: the national climate change response White Paper; the National Development Plan - vision for 2030; the National Planning Commission's diagnostic report; South Africa new growth path - framework; South Africa integrated resource plan 2; and South Africa's industrial policy action plan 2012/13. This policy framework, together with commitment by Government, implies that more resources will continue to be allocated to funding green initiatives throughout the country beyond the initial funding commitment. Moreover, to support the governmental drive for an environmentally sensitive development path, Government departments will continue to increasingly ensure that their programmes address national priorities for poverty reduction and job creation, as well as environmental concerns. However, the programme has just started to provide meaningful judgements on its sustainability beyond current funding commitments. With the overall commitment by Government to steer the economy into a low-carbon economy, while also addressing socioeconomic development challenges, there is great potential for the programme to be replicated both in South Africa and other countries.

Lessons learned

There is a need to provide an enabling environment to realise the commitment to inclusive green growth policies and programmes The Green Fund has just issued two calls for proposals. The South African Government has adopted various legal and policy documents focused on steering the economy into a low-carbon orientation. The Green Fund provides an opportunity for the Government to practically realise the targets set out in the various policy and planning documents. The funding provided supports the Government's drive to address environmental issues and the development challenges of poverty reduction and job creation, among other things.

More resources are required if South Africa is going to achieve its ambitious targets of steering the economy into a green growth path significantly reducing emissions. International and private sector support is critical to supplement Government resources in implementing the flagship green growth interventions recommended by the policy documents discussed above. It is also important to have structures in place to monitor and measure progress towards defined national goals for each of the funded projects. Although it is too early to assess how the fund has performed, it is important to estimate the sustainability of funding after the first three years of Government funding.

Awareness-raising and capacity-building for prospective applicants is critical to ensure the active involvement of stakeholders, especially women and other disadvantaged groups. Given that the green growth path being promoted by the Government is a newly developing field, it is important to provide structures to build capacity encouraging the involvement of the various stakeholders, especially disadvantaged groups.

The targeting of beneficiaries needs to clearly articulate gender considerations. The Green Fund beneficiaries of research and development grants include research institutes, universities, private companies, Government-affiliated institutions and entities, and non-profit organisations. Although these institutions have preferential employment equity plans, it is critical that projects applying for funding highlight disadvantaged groups such as women and young people, to ensure their involvement. To ensure the involvement of women and other disadvantaged groups it is important for the funding process to target projects elaborating on how women and other disadvantaged groups are to be involved.

The successful implementation of funded Green Fund green growth interventions has the potential to stimulate economic, social and environmental benefits for the whole country. Such interventions can make an enormous contribution to economic growth, job creation and the reduction of carbon dioxide emissions. Increased investment in and sustainability of funded projects has great potential to generate spinoff benefits that could contribute to addressing the developmental challenges and environmental goals facing the country.

Case 4: Industrial Energy Efficiency improvement project

Design and implementation strategy

The Industrial Energy Efficiency (IEE) project is hosted by the National Cleaner Production Centre of South Africa, and is being implemented together with the United Nations Industrial Development Organisation. The project was established by UNIDO in 2010 as a collaborative initiative between the South African Government through the Department of Trade and Industry and the DOE, the Swiss Secretariat for Economic Affairs (SECO) and the Department for International Development of the United Kingdom (DFID) (www.ncpc.csir.co.za; 2005). A project steering committee with representation from the DOE, the DEA, thedti, Business Unity SA (BUSU), the National Business Initiative (NBI), SECO and DFID provides strategic guidance for the project (see Table 12). The design of the project involves strong partnership between various stakeholders: Government, business and international organisations. The involvement of business is important for the uptake and adoption of project principles across the business sector. Government provides the policy framework and resources, while international organisations provide technical capacity and resources. Mutual learning, capacity-building and provision of resources among the various stakeholders are important precedents for inclusive green growth initiatives.

The IEE project aims to contribute to the sustainable transformation of industrial energy usage practices in South Africa and possibly in the Southern African region by “putting the system of Energy Management Standards (EMS) in place and facilitating its use by industries in the agro-processing, chemical and liquid fuels, mechanical engineering, automotive and mining sectors” (<http://www.iee-sa.co.za/>).

The IEE project is designed to stimulate demand for energy efficient services through:

- (i) formulating and implementing an enabling policy framework, including a supportive financial mechanism for energy efficiency;
- (ii) Creating institutional capacity to implement the EMS;
- (iii) Awareness-raising;
- (iv) Energy audits; and
- (v) Local demonstration projects.

The project also supports the supply of energy efficient services through building institutional capacities to accredit and certify EMS compliance, and by training local trainers and consultants in EMS implementation and energy system optimisation (<http://www.iee-sa.co.za/>).

Expected/realized outcomes and impacts

The expected outcomes of the IEE project are to “contribute to the sustainable transformation of industrial energy usage practice in SA, reduce carbon-dioxide emissions, and demonstrate the impact of energy efficiency practices as a means of increasing sustainability” (www.ncpc.csir.co.za, 2005). The following five key industries have been identified as the primary initial focus of the IEE project on the basis of their potential to bring about significant reductions in overall energy consumption of the country: agro-processing; chemicals and liquid fuels; metals processing and engineering; the automotive sector; and mining. The project aims to contribute to the national energy demand reduction target of 15 per cent by the year 2015 for mining and industry, and 12 per cent for the country as a whole (www.ncpc.csir.co.za, 2005).

The IEE project was established in response to the growing need to improve energy efficiency in South Africa and to contribute to the global drive for greater energy efficiency (<http://www.iee-sa.co.za/>). According to the NCPC-SA, case studies of participating companies show considerable energy and financial savings through the implementation of energy efficiency recommendations and interventions. The IEE project clearly plays a critical role in improving production efficiency and output in the targeted industries.

Economic impacts

Through promoting industrial energy efficiency, energy management systems, energy standards development training and system optimisation for small and medium enterprises, the IEE project supports national energy security, promotes job creation, improved production efficiency, improved productivity and reduced production costs. These benefits have a positive spin off for national economic growth and performance. The project contributes to improving the competitiveness and capacity of businesses adopting energy management systems. Furthermore, cleaner production processes produce more competitive products on the markets, as consumers are increasingly environmentally sensitive to the goods and services they consume. The widespread adoption of IEE project principles accordingly has the potential to increase the competitiveness of South African products for both domestic and export markets. This would increase both the companies’ profits and national output and income.

The IEE project showcases Toyota South Africa as one example of companies that are demonstrating significant energy performance improvements through their interaction with the project. The company signed up for the project as the host plant of an IEE project in August 2010. Through IEE training courses, Toyota South Africa implemented energy management systems optimizing specific industrial systems, resulting in a considerable reduction in electricity usage. Through collaboration with the IEE project, Toyota South Africa managed to save 8.15GWh, translating into cost-savings of more than ZAR4.8 million over the two-year period 2010-2011.

Social impacts

Improved production performance in targeted industries would lead to increased employment there. This could be replicated in other industries.

Environmental impacts

The IEE project supports and complements initiatives driven by the Department of Energy which are focused on ensuring sustainable energy supply, security and efficiency. The project is one of the pillars of the Department of Energy's energy efficiency campaign. The use and adoption of industrial energy efficiency and energy management systems contributes to the national aim of reducing carbon dioxide emissions.

Enabling measures

The Department of Energy has reviewed its National Energy Efficiency Strategy with a view to ensuring an enabling policy framework supporting energy efficiency in the country. The collaboration of national and international partners in the project has been beneficial in many respects, for example, national Government departments provide policy frameworks, guidance and resources, while international partners contribute expertise and financial resources thus facilitating the practical implementation of IEE principles.

Table 12 Industrial Energy Efficiency project partners and responsibilities

Partners	Main roles and responsibilities
Department of Energy	Mandated to promote energy efficiency and energy planning in South Africa. Led the initiative to request assistance from UNIDO in the development of a special project to promote industrial energy efficiency. Responsible for preparing and implementing relevant policies and regulations supportive of the implementation of the project. Provides local funds for the project.
Department of Trade and Industry	Mandated to ensure a healthy work environment for the growth of a productive industrial sector. Building capacity to formulate and manage effective best practice support structures and incentives that encourage the use of industrial energy management. Facilitates investment support for industry and the removal of communication and trade barriers. Provides local funds for the project.
United Nations Industrial Development Organisation	Entrusted by the South African Government with the implementation of the project by providing all required services. Main service provider and is responsible for the proper and timely implementation of the project.
Swiss State Secretariat for Economic Affairs (SECO) and the United Kingdom Department of International Development (DFID)	Provide international funding, which is channelled to the project through UNIDO.
National Cleaner Production Centre of South Africa (NCPC-SA)	Currently hosted by the project. Facilitates resource efficiency and cleaner production assessments in industry, specifically in the areas of energy, water and materials. The project will be integrated with the NCPC-SA to ensure the sustainability and legacy of the initiative after its four-year life span.
CSIR	Provides the infrastructure and the legal framework within which the NCPC-SA and the IEE project operate.

Source: <http://www.iee-sa.co.za/>.

Cross-cutting issues

Science and technology

The IEE project is primarily focused on addressing energy efficiency in South Africa, although it is expected to have a regional influence as well. Through its focus the project contributes to the use and valorisation of local resources and technologies by putting the system of energy management standards in place and by facilitating its use by industries in the agro-processing, chemical, liquid fuels, mechanical engineering, automotive and mining sectors.

Climate change

The IEE project integrates dimensions of climate change through its focus on demonstrating the positive impact of energy management as a means of reducing carbon-dioxide emissions, while also demonstrating the effectiveness and financial impact of in-plant energy management. Reduced energy demand from the adoption of IEE principles contributes to reducing carbon dioxide emissions and supports the national objective of reducing greenhouse gas emissions.

Gender

The focus on companies in South Africa encourages the local use of resources such as labour and capital. However, it is not clear to what extent women and other disadvantaged groups are involved in the project. In line with inclusive green growth principles, it is essential to ensure the involvement of women and other disadvantaged groups.

Sustainability and replicability

South Africa launched its first National Strategy for Energy Efficiency (NSEE) in 2005, in response to climate change issues and as a way of addressing the looming energy crisis facing the country. The National Strategy for Energy Efficiency sets a target of improving energy efficiency by 2015, by 12 per cent for the entire economy, and by 15 per cent for industry. However, this was a voluntary undertaking, with limited resources being allocated for its implementation. Engagements between DME and UNIDO led to the establishment of the IEE project (<http://www.iee-sa.co.za/>). It is very probable that the project's key concepts will be sustained by participating companies motivated by the considerable energy and financial savings arising from their implementation of its energy efficiency recommendations and interventions. The IEE project is designed to be integrated with the NCPC-SA, to ensure the sustainability and legacy of the initiative after its four year life span.

The NSEE and the Government policy and planning documents discussed above provide the policy framework for the sustainability of the IEE project. As indicated earlier, Government policy and planning documents are focused on steering the economy from a resource-intensive development path to a low-carbon and green economy. The activities of the IEE project would be further supported by Government programmes contributing to the national drive addressing developmental challenges such as access to productive energy and energy efficiency, while also addressing environmental concerns such as climate change. This is an excellent opportunity to replicate the successes of the IEE project.

Lessons learned

Collaboration between national and international partners can facilitate the implementation of IEE project principles. The project brings together national and international partners sharing resources and expertise to facilitate its implementation. For example, Government departments help to ensure an enabling policy environment as well as resources and international partners contributing resources and expertise. Other key players such as the NCPC-SA ensure the practical implementation of the project and build the national capacity to enhance the use and adoption of industrial energy efficiency nationwide.

The sustainability of inclusive green growth interventions is important, and needs to be built-in to the planning and design of programmes and projects. The IEE project has been planned to be continued with the NPC after the four-year funding period is finished. Ensuring the sustainability of such initiatives also ensures that lessons learned from the initial funding period are integrated in the scaling up of the intervention as it reaches wider sectors and industries.

Effective energy management practices can contribute to cost savings and competitiveness improvement. Through promoting industrial energy efficiency and energy management systems, the IEE project helps companies reduce production costs and improve their competitiveness. The example of Toyota South Africa shows that companies which adopt energy efficiency and management systems can significantly reduce production costs while also improving their competitiveness.

Cost reduction, improved productivity and competitiveness can help promote the sustainability of industrial energy efficiency and management systems. The reduced costs and improved productivity and competitiveness resulting from the adoption of industrial energy efficiency and management systems are key to the sustainability of IEE project principles. Companies that realise these benefits after adopting the IEE principles have positive incentives to continue improving their energy efficiency. Such companies also provide examples for others to follow. This can help promote IEE principles across the spectrum of South African industry. The considerable energy and financial savings resulting from the implementation of energy efficiency recommendations and interventions are key to the sustainability of the IEE project. The real savings from participating companies provide practical evidence of the success of the IEE project, and stimulate and encourage the widespread adoption of its concepts.

Industrial energy efficiency can significantly contribute to carbon dioxide emissions reduction. As the South African industrial sector⁶ is one of the major users of energy in the country, improved energy efficiency in the sector offers great opportunities to contribute to reducing demand for energy. IEE project principles contribute to the sustainable transformation of industrial energy usage in South Africa, by reducing CO₂ emissions and demonstrating the positive impact of energy management as a means of increasing profitability. This has contributed significantly to the attainment of national targets on carbon dioxide emissions reduction. Moreover, national energy security and sustainability are improved through the industrial use of energy efficient management systems.

IEE principles can significantly cut national energy use and can improve energy security. Promoting improvements in the energy efficiency of industrial facilities through energy management and use and the adoption of energy-efficient industrial technologies can significantly reduce the demand for energy. This can contribute to improving national energy efficiency and security for the country.

Case 5: Energy and Environment Partnership programme

Design and implementation strategy

The Energy and Environment Partnership (EEP) programme in southern and eastern Africa started in 2010. The EEP supports projects that demonstrate high innovation in delivering energy services, facilitating technology transfer and encouraging cooperation and local stakeholders' participation, while also providing sustainable energy services for the poor and combating climate change (<http://www.eepafrica.org/>). The overall objective of the EEP Southern and East Africa is to increase access to modern, affordable and reliable energy services through the increased use of renewable energy technologies. The overall objective is expected to be reached by achieving the following result areas (FCG, 2012):

- Market understanding, institutional support and knowledge management
- Opportunities for public and private financing for project and business development
- Financing the implementation of national or regional pilot and demonstration projects

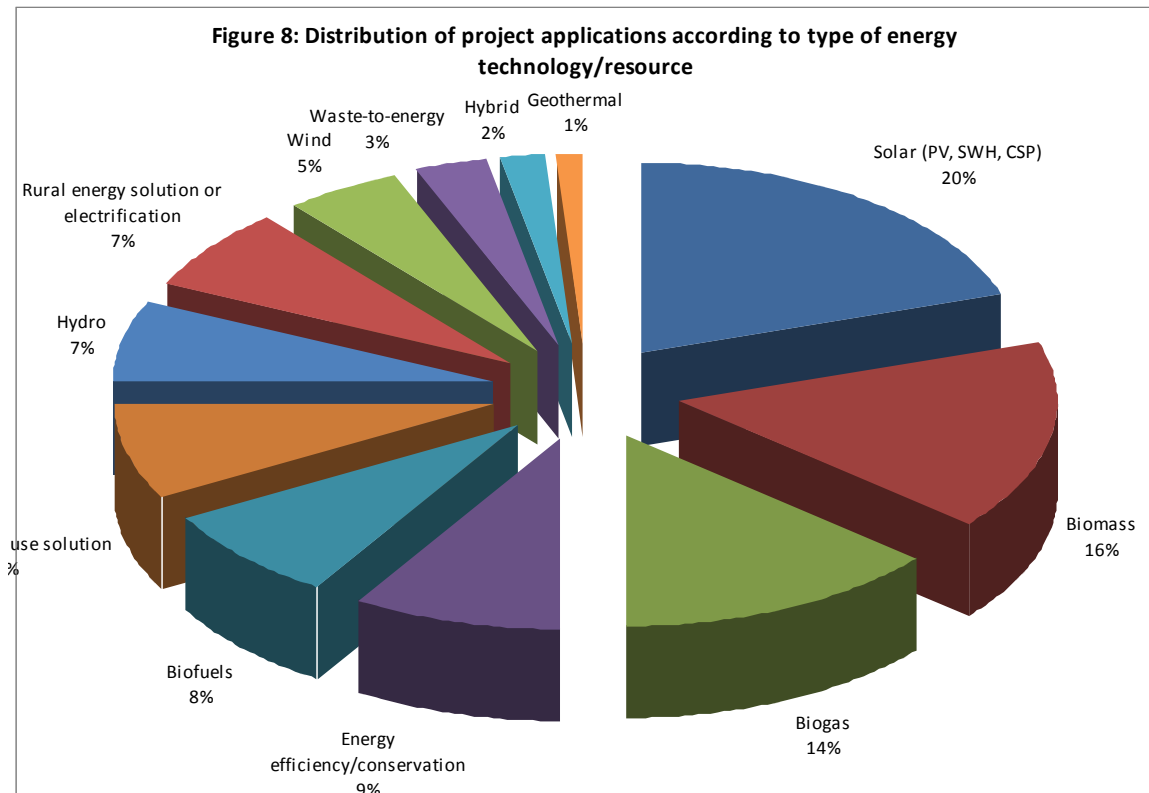
⁶ The project initially focused on the following sectors: agro-processing, chemicals and liquid fuels, metal-processing and engineering, the automotive industry, and mining.

The partnership hosted by the Development Bank of Southern Africa in South Africa is jointly funded by the Governments of Finland and Austria and was recently joined by the Department for International Development of the United Kingdom. The programme focuses on supporting the participation of all stakeholders (private, public sector and civil society) to promote partnerships between all stakeholders (local, regional or international) (<http://www.energy.gov.za/>; <http://www.eepafrica.org/>). National focal points in the relevant Government departments in the partner countries - Botswana, Kenya, Mozambique, Namibia, South Africa, Swaziland, Tanzania and Zambia - facilitate the practical engagement and participation of all stakeholders. The coordination of the participation of all stakeholders is led by the Regional Coordination Office (RCO) of the DBSA.

This partnership approach is practically facilitated through national focal points in the relevant Government departments in the partner countries - Botswana, Kenya, Mozambique, Namibia, South Africa, Swaziland, Tanzania and Zambia. For example, the national focal point for South Africa is the Renewable Energy Directorate in the Department of Energy. A Regional Coordination Office (RCO), which is established at the DBSA, coordinates the participation of all stakeholders from the partner countries (<http://www.energy.gov.za/>).

The EEP programme mainly uses periodic calls for proposals (at least two annually), open to public and private entities, research institutions, universities, and civil society organisations. The programme provides seed funding for innovative projects in addition to the proponents' own contributions. The calls for proposals mainly focus on feasibility and pre-feasibility studies and pilot and demonstration projects (<http://www.energy.gov.za/>). Figure 8 shows the distribution of project applications responding to the second call for proposals for the EEP programme. The figure depicts a broad spectrum of the energy technologies and resources considered in the programme.

Figure 8 Distribution of project applications according to type of energy technology/resource



Source: (EEP, 2011).

Table 13 Energy and Environment Partnership programme projects in South Africa

Project Code	Project name	Type of Technology/ Energy resource	Organization/ Company	Duration [Months]	Type	Total Budget [€]	EEP Budget Financing[€]	Status
SA18	University of KZN Biogas Pilot Plant, South Africa	Biomass-biogas digesters	Karebo Power Projects Pty Ltd	24	Feasibility	921,960	100,000	On going
SA2052	Automatic Meter Reading (AMR) electricity consumption meters and energy management programme in administrative buildings owned by City of Cape Town	Automatic meter reading, energy efficiency	City of Cape Town (metropolitan) municipality	24	Demonstration	310,000	100,000	On going
SA2059	Utilising a biomass-to-energy solution as an instrument to stimulate economic development, community enhancement and wealth creation in the Nkomazi district of Mpumalanga	Biomass for electricity generation	Mpumalanga Cane Growers' Association	6	Feasibility	409,227	100,000	On going
SA2070	Mkhomazi run-of-river hydro-electric feasibility study	Hydro-power	uMgungundlovu municipality, KZN	12	Feasibility	101,756	82,684	On going
SA21	Comprehensive community solar energy development project	Solar PV-home and street lighting	ZRW Mechanika	6	Demonstration	251,881	180,000	Completed
SA2116	Solar water heater mass rollout businesses in Cape Town and Ekurhuleni	Solar water heaters	Sustainable energy Africa (SEA)	23	Demonstration	768,421	189,474	On going
SA304	Renewable Energy Solutions clean cook stoves	Renewable Energy Solutions	Renewable Energy Solutions	12	Demonstration	61,200	28,000	On going
SA332	Biomass gasification for combined heat and power (CHP) generation for MERU eco-campus, Mpumalanga/Gauteng, South Africa	community individual and development association	community individual and development association	9	Demonstration	300,000	200,000	On going
SA334	Pre-feasibility: ethanol production from sweet sorghum to support the comprehensive rural development programme in South Africa	Cence collaborative (Association Incorporated under Section 21)	Cence collaborative (Association Incorporated under Section 21)	12	Pre-feasibility	200,000	180,000	On going
SA50	Goodwood correctional facility waste treatment and biogas pilot project feasibility	Biogas-waste water management	AGAMA Energy	6	Feasibility	79,372	74,000	Completed
SA59	Waste to energy biogas plant	Biogas-waste management	Bio 2 Watt (Pty) Ltd	6	Feasibility	235,340	50,000	Completed
SA9	Arid areas biodigestion demonstration plant, South Africa (pilot project)	Biomass-biogas digesters	Elemental Africa	6	Feasibility	45,773	35,000	Completed

Source: (<http://www.eepafrica.org/>).

Expected/realized outcomes and impacts

The expected outcomes of the Energy and Environment Partnership programme (EEP) with Southern and Eastern Africa are to provide sustainable energy services for the poor while simultaneously combating climate change through promoting renewable energy, energy efficiency, and clean technology investments in selected partner countries (<http://www.energy.gov.za/>; <http://www.eepafrica.org/>). The EEP programme is currently supporting 52 projects in eight countries: Botswana, Kenya, Mozambique, Namibia, South Africa, Swaziland, Tanzania and Zambia. The EEP programme has recently been launched in Burundi, Lesotho, Rwanda, Seychelles, and Uganda. Table 13 summarises EEP programme projects in South Africa.

The EEP programme has managed to promote the participation of the following stakeholders: the private sector, the public sector and civil society. According to the midterm review of the programme, participating Governments and the Southern Africa Development Community are supporting the programme and want it replicated in other countries (Finnish Consulting Group, 2012). Although the EEP programme has planned for national level activities to monitor the funded projects, project impacts are at present difficult to assess, as the implementation of individual projects has just started.

Economic impacts

Through supporting renewable energy technologies, the more efficient use of traditional energy sources and the adoption of innovative business models for the provision of energy services, the EEP programme contributes to the creation of local employment opportunities and clean energy-based economic growth. Productive use of renewable energy services contributes to economic development and poverty reduction, especially in rural areas.

Social impacts

The EEP programme contributes to addressing energy, poverty and security challenges in the region. Through promoting access to sustainable, reliable and affordable energy service solutions from renewable energy it contributes to poverty reduction in reducing the cost of energy and social services operations such as health, education and communications (EEP, 2011). As noted above, improved local economic development from the productive use of renewable energy sources contributes to poverty reduction, while also improving the welfare of the poor. Overall, improved access to modern energy sources contributes to improvements in service delivery in poor communities.

Environmental impacts

The EEP programme promotes renewable energies and energy efficiency with the purpose of contributing to the sustainable development and mitigation of global climate change, land degradation/ desertification and indoor and outdoor air pollution, as well as of biodiversity, the protection of wetlands and rivers and the preservation of forests (EEP, 2011). The evaluation criteria for projects applying for funding also consider their environmental impacts. In addition, the promotion of renewable energy technologies, the more efficient use of traditional energy sources, and the adoption of innovative business models for the provision of energy services help prevent negative environmental manifestations of the energy system such as GHG emissions and local environmental impacts⁷.

Enabling measures

The energy division of the SADC's protocol on energy supports regional cooperation on energy. Although the protocol established a favourable political environment for renewable energy and energy efficiency, limited resources hinder its full implementation (FCG, 2012). The funding for the EEP programme is an important tool for the practical implementation of its projects. This partnership approach is practically facilitated through national focal points at the relevant Government departments in the partner countries which coordinate national stakeholders participating in the programme. The regional coordinating office also facilitates the coordination of participating stakeholders from partner countries.

⁷ <http://www.eepafrica.org/index.php/about-the-partnership/49>.

Cross-cutting issues

Science and technology

The EEP programme's contribution to the use and valorisation of local resources and technologies is supported by encouraging cooperation and local stakeholders' participation in projects, while also providing sustainable energy services for the poor and combating climate change. The national focal points in relevant Government departments of partner countries such as the Renewable Energy Directorate in the Department of Energy in South Africa facilitate the participation of the following local stakeholders: the private sector, the public sector and civil society.

Climate change

In addition to providing sustainable energy services for the poor, the EEP programme is designed to simultaneously contribute to combating climate change through promoting renewable energy, energy efficiency, and clean technology investments in selected partner countries. The overall objective of the programme is to increase access to sustainable energy services derived from renewable energy sources (solar, hydro, wind, bioenergy and geothermal) and the reduced growth rate of greenhouse gas emissions due to energy services. This clearly addresses climate change issues, especially the reduction of GHG emissions from the energy sector. For South Africa, supported projects provide a broad base of green interventions that contribute to transitioning the country into a low-carbon economy while also addressing developmental challenges and climate change. However, because most projects funded through the programme have just started, considerable effort would be required to measure and verify contributions to energy savings and reductions in future emissions and greenhouse gases.

Gender

The EEP programme's approach to gender is to promote energy solutions which cater for different energy needs of men and women given their different roles and responsibilities in the household and in society. The introduction of new forms of energy may have positive effects on men and women, thus they must be assessed thoroughly during evaluation for consideration for financial support (EEP, 2011, p. 22).

Sustainability and replicability

The EEP programme is designed to provide seed funding "to cover part of the project costs which are necessary to start and develop a business (such as pilot and demonstration activities) or which can create something in value so that it is worthy of investment (such as pre-feasibility and bankable feasibility studies). Funding at this stage helps the businesses to sustain themselves for a period of development until they reach a state when they are able to secure investment to continue funding themselves" (<http://www.eepafrica.org/>). Although it is difficult to arrive at conclusions about the sustainability of the funded projects because most of them have just started, their co-funding structure involving project proponents is important to ensure their sustainability. Moreover, EEP programme funding is designed to provide crucial initial support for businesses, ensuring their sustainability to a point when they are creditworthy and able to continue funding themselves. This would help ensure that the projects continue beyond the initial implementation phase. However, the projects will still need to be evaluated, to determine which proportion has managed to continue after initial support from the EEP programme lapses. The programme has a lot of potential for replication within South Africa and other countries. As noted above, the EEP programme is being extended to other countries in the region, and has recently been launched in Burundi, Lesotho, Rwanda, Seychelles, and Uganda.

Lessons learned

The EEP programme contributes to addressing both socioeconomic and environmental challenges in the region. The design and implementation of the programme shows how sustainable energy can be provided for the poor, while simultaneously addressing climate change issues. However, it is important to establish mechanisms showing clearly how the poor will benefit from reducing emissions and greenhouse gas emissions through such interventions.

The EEP programme offers a regional approach to address challenges affecting the region. The engagement of regional partners including various local stakeholders (private sector, public sector and civil society) in the programme encouraged through national focal points at the relevant Government departments in the partner countries to offer opportunities for a regional approach to addressing regional challenges such as energy and poverty. This embraces the need for collaboration among these stakeholders in addressing challenges facing the poor, while addressing global environmental issues such as climate change.

The EEP programme's regional approach promotes and strengthens intraregional relations between national authorities involved in the energy sector and renewable energies. The regional partnership coordinated at the national level by national focal points has been hailed in the midterm review of the programme as instrumental in the establishment of more sustainable relationships between key actors in the field of regional renewable energy development, enhancing the willingness of all to work towards common goals.

The regional partnership approach provides an important platform for the widespread sharing and exchange of knowledge and experiences. The EEP programme's regional approach has the potential to enrich the sharing of information and knowledge about the implementation of projects among the participating countries. This is important in extending good practices and experiences beyond specific project areas while also contributing to regional goals of addressing energy challenges. The EEP programme projects are required to actively promote participation by stakeholders and end-users in the planning, implementation and management of energy solutions, taking into consideration the local knowledge and traditions and involvement of local communities and end-users, especially women, in the development of the sector (EEP, 2011).

Supporting demand-driven energy solutions and activities tailored to the context of the country-specific energy system contributes to the sustainability of EEP initiatives. The EEP programme, through providing seed funding to support demand-driven solutions, may be an important factor in facilitating the sustainability of funded projects. Moreover, support for initiatives that are context-specific and that address local problems encourages those who are involved in other projects to learn and benefit from their successes.

The EEP programme enhances local socioeconomic development by supporting demand-driven solutions and activities. The local demand for renewable energy technologies, the more efficient use of traditional energy sources and innovative business models for the provision of energy services, offer great opportunities for stimulating local socioeconomic development. For example, economic activities enhanced by the programme contribute among other things to improving local production and creating local employment opportunities. This contributes to efforts to address developmental challenges facing the region such as economic growth, poverty and unemployment.

Case 6: Working for Wetlands programme

Design and implementation strategy

The Wetlands programme provides valuable ecosystems services such as the following (WRC, 2009):

- (i) Supports a range of specialised plant, insect, bird and mammal life while also supplying wild food, grazing, building and craft materials for the local population;
- (ii) South African wetlands are important sites for small-scale subsistence agriculture;
- (iii) Absorbs flood waters, improves water quality and regulates stream flow, helping to maintain downstream ecosystem functioning; and
- (iv) Provides many culturally and economically important species, including wild food, craft and medicinal plants that are important for rural communities.

In spite of the important services provided by the Wetlands programme, South Africa's wetlands resources have been significantly degraded in recent years. Figure 9 depicts the ecosystem threat status of terrestrial, river, wetland, estuarine, coastal, inshore and offshore environments. It has been established that wetlands are the most threatened of all South Africa's ecosystems, with 48 per cent of wetland ecosystem types criti-

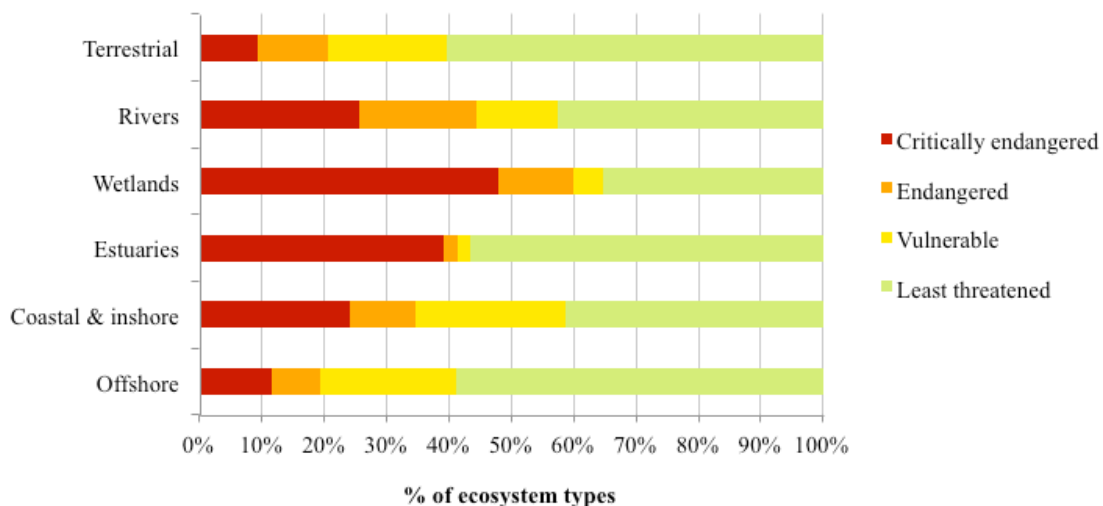
cally endangered. Wetlands make up only 2.4 per cent of the country's total area, with this area representing a high-value ecological infrastructure that provides critical ecosystem services such as water purification and flood regulation. Many of South Africa's wetlands have already been irreversibly lost, which implies that all ecosystem services which they provided have also been lost. In terms of endangered ecosystems, rivers have the highest rate (19 per cent), while terrestrial ecosystems are the most vulnerable (19 per cent). Similarly, terrestrial (60 per cent), estuarine (57 per cent) and marine and coastal habitats (53 per cent) have the least threatened ecosystems.

Working for Wetlands (WfWet) is a joint initiative of the Departments of Environmental Affairs, Agriculture, Forestry and Fisheries and Water Affairs. The programme is housed within the South African National Biodiversity Institute. The WfWet programme is based on the following key interlinked concepts that ensure effective and sustainable wetland rehabilitation (<http://wetlands.sanbi.org/index.php>):

- (i) Wetland protection, wise use and rehabilitation;
- (ii) Skills and capacity development;
- (iii) Cooperative governance and partnerships;
- (iv) Research and knowledge sharing; and
- (v) Communications, education and public awareness.

The WfWet is designed to create employment opportunities for unemployed people, equipping them to generate income while rehabilitating and protecting wetlands. As part of its capacity building, the programme provides vocational skills, as well as life skills such as literacy, primary health, personal finance and HIV/Aids awareness. Field visits with decision makers and the distribution of resource materials are some of the means used to educate the programme's diverse stakeholders (<http://wetlands.sanbi.org/index.php>).

Figure 9 Comparison of ecosystem threat status in terrestrial, river, wetland, estuarine, coastal, inshore and offshore environments



Source: Driver et al. (2012).

Expected/realized outcomes and impacts

Economic impacts

The expected outcome of the Working for Wetlands (WfWet) programme is to rehabilitate and protect wetlands as a vehicle for both poverty reduction and the wise use of wetlands through cooperative government and partnerships between landowners, communities, civil society and the private sector. The WfWet is part of the Expanded Public Works Programme. It seeks to maximise employment creation, to create and support small businesses and to transfer relevant and marketable skills to beneficiaries (<http://wetlands.sanbi.org/index.php>).

Social impacts

The social benefits provided by Working for Wetlands include employment, training, enterprise development and the dignity of decent work. The benefits from rehabilitated wetlands include improved livelihoods, protection of agricultural resources, enhanced biodiversity, cleaner water, reduced impacts from flooding and increased water security. As of 31 December 2013 about 12,848 employment opportunities have been created so far, with 2.2 million person days worked to date. Moreover, the WfWet programme has provided 168,400 days of training in vocational and life skills. Teams are made up of a minimum of 60 per cent women, 20 per cent young people and 1 per cent people with disabilities (<http://wetlands.sanbi.org/index.php>).

Environmental impacts

Over the past 12 years the WfWet programme has invested ZAR530 million (approximately \$60 million) in the rehabilitation of 906 wetlands, improving or securing the health of more than 70,000 hectares of wetland area.

Enabling measures

Through the Department of Environmental Affairs South Africa has developed a range of policy and legislative frameworks, especially in the environment and water sectors. These frameworks that help to protect terrestrial, marine and coastal resources include the following: the National Protected Area Expansion Strategy; Provincial Protected Area Expansion Strategies; the South African National Parks Land Acquisition Plan; National Environmental Management: the Protected Areas Act 2003; the National Protected Areas Database; and the National Biodiversity Framework (DEA, 2012). These national policies and strategies, together with funding for the WfWet programme, facilitate the implementation of measures to rehabilitate and protect South Africa's wetlands.

Cross-cutting issues

Science and technology

The WfWet programme supports the use of local resources in supported projects. The engagement of various stakeholders facilitates research into and sharing of technologies and approaches to wetland rehabilitation, protection and wise use. Moreover, the active involvement of local beneficiaries ensures active demand for science and technology measures from research. Furthermore, improved local economic development resulting from capacity-building activities from the WfWet programme contributes to increased demand for improved goods and services in the local economy.

Climate change

The WfWet programme provides an important form of ecosystem-based adaptation to climate change, as well as mitigation potential from protected wetland ecosystems. The programme can be further promoted to capitalise on opportunities for adaptation and mitigation to climate change among poor communi-

ties. Its two slogans, set by the Ramsar Convention on Wetlands for World Wetlands Day 2010, were “Wetlands, Biodiversity and Climate Change” and “Caring for Wetlands - an answer to Climate Change” (<http://wetlands.sanbi.org/index.php>). This further emphasises the opportunity for healthy wetlands to contribute to climate change adaptation and mitigation strategies.

Gender

Gender concerns are also addressed in the WfWet programme through the involvement of a significant number of women. For example, as indicated above, WfWet teams are made up of a minimum of 60 per cent women, 20 per cent young people and 1 per cent people with disabilities.

Sustainability and replicability

The WfWet programme design involving various partners including landowners, communities, civil society and the private sector provides opportunities for the sustainability of the programme after its initial funding has come to an end. The WfWet programme has been running for more than 12 years. The above-mentioned interlinked concepts followed by the programme contribute to effective and sustainable wetland rehabilitation. For example, skills and capacity development, communication, education and public awareness are important for sustainability beyond the initial funding phase. There is great potential to replicate the programme, which has been expanding for the past 12 years, throughout the country. Other countries can also replicate the WfWet example to help protect wetlands while at the same time addressing poverty challenges. To ensure sustainability, the local participation and capacity development activities of the WfWet programme are important concepts that need to be considered when it is being replicated.

Lessons learned

The WfWet programme uses wetland rehabilitation to address poverty alleviation and promote the wise use of wetlands. Through promoting the rehabilitation and protection of wetlands, the WfWet uses wetlands as a vehicle for both poverty alleviation and the wise use of wetlands. The design structure of the WfWet and its intended outcomes provide an important framework for addressing both socioeconomic challenges such as poverty that are facing communities and environmental concerns.

Wetland rehabilitation helps recover some of the health and values of degraded wetlands. The experiences of the WfWet programme show that wetland rehabilitation offers opportunities to recover the functioning of degraded wetlands. The rehabilitated wetlands are able to recover and offer the various wetland ecosystem services discussed above. The rehabilitation of degraded wetlands complements measures to protect and promote the wise use of wetlands.

The WfWet programme supports the involvement of women. The design of the programme promotes the active engagement of women, with WfWet teams being made up of a minimum of 60 per cent women, 20 per cent young people and 1 per cent people with disabilities.

The involvement of local communities is important for the sustainability of WfWet programme initiatives. The WfWet programme is based in communities where the wetlands are located, and actively engages local landowners and civil society. It is also important to ensure the sustainability of the programme even when external funding is not available.

The WfWet programme promotes employment creation, the creation of small businesses, and the transfer of relevant and marketable skills to beneficiaries. The WfWet is designed to create employment opportunities for unemployed people, equipping them to generate income while rehabilitating and protecting wetlands.

Capacity-building is a key to unlocking socioeconomic benefits in WfWet programme areas. The WfWet programme has very strong capacity-building activities that include vocational skills and life skills such as literacy, primary health, personal finance and HIV/Aids awareness. These diverse skills help beneficiary communities to engage in various socioeconomic activities that contribute to improving their socioeconomic welfare. For example, beneficiaries are able to find employment and to start small business initiatives.

4. General lessons learned, challenges, opportunities and recommendations

4.1 General lessons learned.

The general lessons learned from the selected case studies include the following:

The involvement of local manufacturers of green technologies such as solar heaters and component parts is critical to the promotion of local technology development and manufacturing. Through involving local actors such as businesses and civil society, opportunities are created to stimulate local innovations in IGG interventions such as SWHs. The spinoffs from this include their contribution to economic output and job creation and their contribution to environmental benefits for the country through the production and use of green technologies. This is also important for the sustainability of the IGG and green economy agenda.

The targeted involvement of women and other vulnerable groups is important for IGG interventions. In order to ensure that these interventions lead to inclusive green growth it is necessary to target the involvement of vulnerable groups of the population as beneficiaries of all green technology development and manufacturing value chain achievements. Examples of this would include women and young people who are local manufacturers, and jobs targeting vulnerable women and young people.

Need to institute built-in monitoring, evaluation and accountability systems. IGG interventions require the design and implementation of monitoring, evaluation and accountability systems. Systems need to be put in place to gather data that can be used to measure and evaluate the impacts of the IGG interventions against defined objectives. The measurement and evaluation systems should be set up from the very beginning, with ongoing data collection related to defined indicators and variables, to measure the impact of the programmes.

There is a need for increased support in skills training and capacity building. As the lack of skills for the specialised activities required for inclusive green growth interventions is a limiting factor for the involvement of disadvantaged groups, it is necessary to invest in capacity building. The involvement of targeted groups in inclusive green interventions would require increased support in capacity-building targeting beneficiaries such as women, young people and their stakeholder groups. However, it is important to note that these skills training and capacity-building activities should be specific to each IGG initiative.

More resources will be required if South Africa is to achieve its ambitious target of steering the economy into an inclusive green growth economy path. International and private sector support is critical to supplement Government resources in implementing the flagship inclusive green growth interventions recommended in policy documents.

The sustainability of inclusive green growth interventions is important, and needs to be built into the planning and design of IGG programmes and projects. The design and implementation of IGG programmes and projects should consider the sustainability of interventions beyond the initial phase of seed funding. Demonstrating that flagship projects can sustain themselves beyond this initial phase is a key to scaling up IGG interventions and rolling out new ones across the various sectors of the country.

Although current policies present opportunities for South Africa to achieve inclusive green growth, it is too early to evaluate their performance in addressing this overall objective. Furthermore, some of the commitments, especially those related to greenhouse gas emissions, were predicated on the assumption that the country will receive international support in terms of resources and technical capacity.

Green growth interventions require local communities, as final beneficiaries, to be equipped with entrepreneurial skills enabling them to productively use green growth technologies for income-generating activities. As they start to realise financial returns from the use of green growth technologies, they can be encouraged to save small amounts for the continuing purchase of more green growth products and services.

Pro-poor credit facilities need to be set up. As they demonstrate their economic viability financial institutions should be encouraged to provide widespread support to poor rural and marginalised urban communities who would need to access and use green growth technologies.

4.2 Challenges

The challenges that South Africa faces in advancing the inclusive green economy agenda and in transitioning to a low-carbon economy include:

The coordination of multiple inclusive green growth interventions remains a challenge. South Africa requires coordinated activity to promote IGG and achieve the envisaged economic shifts to transition to an inclusive green economy, with the ultimate objective of a carbon-neutral economy by 2050. For example, interventions in various Government departments need to be coordinated to avoid duplications and encourage synergy.

More evidence-based research into IGG opportunities is required. Evidence-based research is required to contribute to a deeper understanding of inclusive green growth policy and practice in the country. Moreover, research-based evidence is required about the potential developmental and environmental impacts and challenges from IGG activities.

High unemployment and inequality, poor and highly uneven educational outcomes, growing frustration with public service delivery failures and corruption, and sluggish output growth compared to most other middle-income economies are major concerns. The promotion of IGG and the transition to a green economy need to ensure that the resultant development path addresses these immediate and pressing developmental concerns.

The uncertain investment climate due to prolonged labour conflicts, especially in the mining sector, is also a source of concern. Ongoing labour conflicts in South Africa, especially in the mining sector, could negatively affect domestic and foreign investment in the country. This would also impact on any IGG investments.

South Africa has an energy-intensive economy based on an unsustainable economic development path based primarily on maximising economic growth, as measured by GDP, particularly through mining, manufacturing and agricultural activities. In the context of climate change, the challenge for South Africa is to develop and implement robust mitigation and adaptation measures that would steer the country into an internationally competitive economic trajectory.

Efforts to encourage local industry to develop IGG technologies face competition from other countries. Some of the IGG interventions such as SWHs that are being promoted in South Africa include a very strong local component as part of efforts to promote the development of local industry. However, the development of such industries is facing stiff competition from other countries which might have a comparative advantage in producing these interventions.

High upfront capital costs may impede the pace of adoption of some green growth initiatives. Some of the inclusive green growth initiatives have high upfront capital costs which are highly problematical for many poor households and small businesses with limited incomes or funding. In this context funding sourced from Government, the private sector and donors is critical in ensuring the widespread uptake and use of inclusive green growth interventions.

Skills shortages hamper efforts to absorb the unemployed. The implementation of some IGG interventions will require new skills and competencies. However, most developing countries such as South Africa are lagging behind in identifying and nurturing these competencies and skills. This has a negative impact on the drive to create employment, foster IGG and to transition to an inclusive green economy.

Competition for financial resources between IGG interventions and the developmental challenges facing the country is a major issue. The funding for IGG interventions competes for limited financial resources with current developmental challenges such as service delivery. It is therefore critical for IGG interventions to significantly address these challenges. A critical challenge for South Africa is to implement the various green growth recommendations based on its policies and plans in a cost-effective manner ensuring that the aim of reducing greenhouse gas emissions is met, while also achieving inclusive greener growth in the country. Given the current global economic challenges and dwindling international donor support, any failure by the international community to support IGG interventions in South Africa poses a threat to the achievement of commitments made by the Government of South Africa.

IGG is costly for the poor. The aggressive policies and programmes put in place by the South African Government, especially in the energy sector, present opportunities for significantly reducing South Africa's carbon footprint while also addressing its developmental challenges. However, although global demand for green growth technologies such as renewable energy technologies is increasing, these technologies are generally still expensive for ordinary poor people in South Africa. Affordability for many poor South Africans is therefore a critical impediment to the widespread use and adoption of some of the green growth technologies that are being promoted. It is therefore critical to ensure that affordable and cost-effective technologies are promoted and that means to access these technologies are ensured for the majority of the poor.

4.3 Opportunities

Despite the challenges highlighted above, many opportunities exist for promoting IGG interventions in South Africa, including:

The developmental and environmental challenges facing South Africa offer opportunities for fostering IGG and transitioning to an inclusive green economy. In order to address these challenges, the South African Government recognises the need to move away from the past unjust exploitation of resources, which excluded many communities from economic opportunities and benefits while degrading the environment, towards a more inclusive and sustainable development path. There is great potential for IGG interventions to significantly contribute to addressing the country's short-term poverty reduction and employment creation objectives, while also creating an inclusive, resource efficient, low-carbon, climate and ecologically-resilient development pathway for the country.

The South African Government is committed to contributing actively to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner. South Africa has in recent years prepared and is now implementing climate change mitigation and green economy policies and programmes as part of its efforts to steer its economy into a lowcarbon and green economy transition. The country has identified key flagship mitigation programmes and has started promoting and implementing clean energy resources such as the Solar Water Heating Programme and the Energy Efficiency and Demand Management programme. The country has also established a Green Fund.

Recent green economy and national development plans and policies provide the overarching national framework and enabling environment for advancing the concept of IGG in South Africa. To foster IGG and facilitate the transition to an inclusive green economy, recent national policies and plans stress the need to transform the South African economy by embracing both equity and sustainable development. Examples include:

the South African framework for responding to economic crisis and the Global Green New Deal of the United Nations Environment Programme (UNEP), the National Development Plan Vision 2030, the New Growth Path, the Green Economy Accord, and the National Strategy for Sustainable Development.

An analysis of South Africa's policy frameworks focusing on the green economy highlights a broader commitment from Government to steer the economy towards a more inclusive green growth path. Policy developments have generally witnessed an emerging trend in South Africa's national policy discourse calling for the more responsible use of natural resources and the need to 'act now' on the inclusive green economy agenda. This provides opportunities for IGG interventions to contribute to the transition to an inclusive green economy. Given the overall commitment made by Government to steer the economy into a low-carbon economy, while at the same time addressing the socioeconomic development challenges facing the country, there is great potential for the programme to be replicated not only throughout South Africa, but also in other countries.

Energy efficiency is widely considered as the most cost-effective, least polluting and readily available energy resource and the most fundamental short-term requirement for rapid, ambitious and cost-effective climate change mitigation. For example, energy efficiency enhances the competitiveness of economies and poverty reduction as more energy becomes available. Moreover, productivity gains from energy efficiency provide the opportunity to reduce the cost to the economy of inefficient energy use, while also enhancing the security of supply. Productivity gains also reduce the need to develop new sources of energy supply to serve those without access to modern energy services for health and educational enhancement.

The funding and implementation of key flagship programmes helps to demonstrate the potential and benefits of IGG. The Government, the private sector and international donors have funded and begun implementing key flagship IGG interventions. These projects provide practical evidence of the opportunities that IGG interventions provide, with success stories from their implementation playing a key role in scaling up the implementation and funding of new interventions.

4.4 Recommendations

Based on the findings of the case studies, the following are recommended:

- (i) The implementation of IGG interventions in the country should be coordinated, to avoid duplication and encourage synergy where necessary.
- (ii) Government, business and other developmental partners should increase research support for research institutions and universities to provide evidence-based recommendations on the developmental, economic, social and environmental impacts of IGG. There is also a need for further research to demonstrate value for money in terms of return on investment and measuring the value of the investments in the interventions.
- (iii) The implementation of IGG interventions by Government, business and other partners should address immediate and pressing developmental concerns facing the country such as unemployment, poverty and inequality.
- (iv) Government, business and labour organisations need to address labour conflicts to ensure an investment environment that is conducive to IGG interventions.
- (v) The implementation of IGG recommendations included in the NDP and other national strategic planning documents requires strong political commitment from Government.
- (vi) Support for key flagship programmes and projects of the green economy needs to be strengthened.

- (vii) Support for local industries needs to be enhanced, to strengthen their competitiveness in the IGG technology market.
- (viii) Support for and measures to identify and nurture the new competencies and skills required to develop IGG need to be strengthened.
- (ix) Government, business and civil society organisations need to work together to promote the use and adoption of inclusive green growth interventions.
- (x) Government, business and civil society organisations should provide the majority of the poor with the means to access and the capacity-building to productively use IGG interventions.
- (xi) The successes and lessons learned from pilot IGG interventions by Government, business and civil society organisations should be disseminated and publicised with a focus on those achievements that are important and could encourage other developmental partners to provide additional resources for further investments in and replication of IGG interventions.

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