



Industrial Development Corporation

Your partner in development finance

Green Industries & Technology

Presentation to the Select Committee on Economic
Development

Towards a green future ...

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Context

- **SA one of the higher producers of carbon equivalents**
- **SA lagging behind in carbon credits generation – lost opportunities**
- **Leadership role in Copenhagen**
- **Need to lead in implementation – currently behind**
- **Good sun**
- **Some areas of good wind**
- **Single electricity utility – opportunity and constraint**
- **SA developing country – green technologies expensive**
- **Opportunity to develop new industries – because new internationally, SA can catch up and become leaders**
- **Local production opportunities if we become significant buyers**
- **Low cost of local electricity – sometimes makes greening non-viable – but cost growing**

IDC's strategic approach & focus

Objective: Support development of green industries & technologies

Drivers

- Security of energy supply
- Social impact of job creation
- Aligned with government strategies: Copenhagen accord & IPAP 2
- Protect the environment: assure sustainable living conditions
- Eco-protectionism : tariff and non-tariff measures
- Localisation

GREEN INDUSTRIES & TECHNOLOGIES

ENERGY EFFICIENCY

- Solar Water Heaters & Heat pumps
- Retrofitting of buildings
- Industrial Processes (emission reduction)
- Steam augmentation (Eskom)

RENEWABLE ENERGY

- Waste to Energy (Biogas)
- Landfill gas
- Anaerobic digestion
- High temperature conversion of waste
- Co-generation

Solar Photo Voltaic (PV)
Concentrated Solar Power (CSP)

Wind Power & hydro

Biomass to Energy

WASTE MANAGEMENT*

CARBON FRIENDLY TRANSPORT

- Electric vehicles
- Gas powered buses

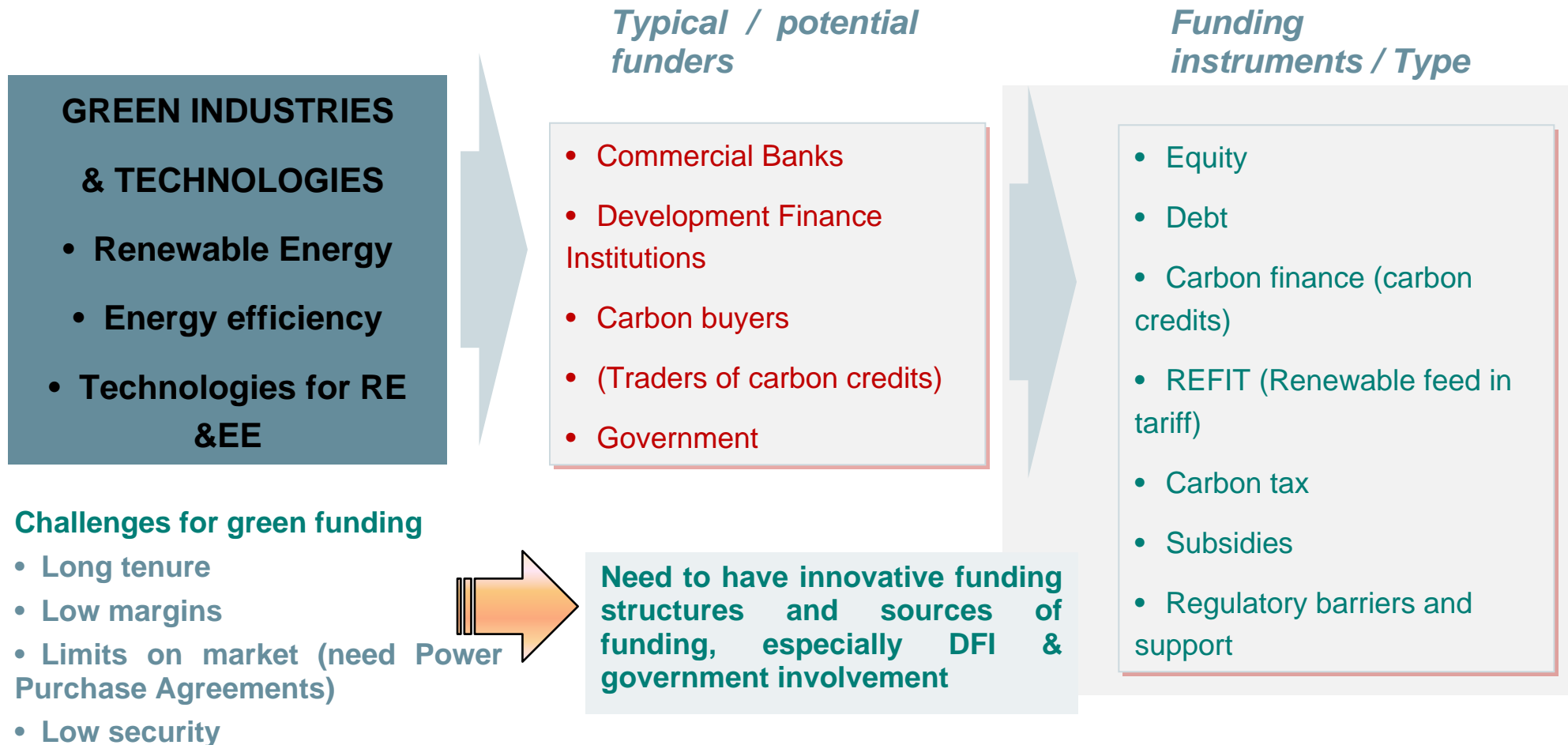
BIOFUELS

LOCAL MANUFACTURING & PROCUREMENT

COORDINATING ROLE OF IDC ACROSS AGENCIES

*Natural resource management (soil & water, biodiversity conservation, recycling)

Funding mechanisms and options for green projects



IDC roles

- **IDC direct funding**
- **Crowding in other funders**
- **Development of new projects in green arena**
- **Demonstrating viability of investments – leading the way**
- **Exploring and accessing international sources of green funding**
- **Development and utilisation of carbon credits – assisting in establishing market**
- **Co-ordinating with other agencies**

Energy Efficiency: Drivers and Barriers

Sector	Main drivers	Main barriers
Solar water heaters (SWH) & heat pumps	<ul style="list-style-type: none"> ➤ Electricity price hikes ➤ Solar potential ➤ Existing incentives and programs ➤ Government commitments 	<ul style="list-style-type: none"> ➤ Lack of local manufacturing capacity ➤ Poor quality of locally manufactured heaters ➤ Slow progress with incentives for heat pumps ➤ Uncertainty on new rebate (Standard Offer Program) by DoE for SWH, placing existing projects on hold ➤ Potential lack of qualified installers (electricians and plumbers) ➤ Limited co-ordination
Improvement in industrial processes EE	<ul style="list-style-type: none"> ➤ Electricity price hikes ➤ Demand side management programs ➤ Power Conservation Program 	<ul style="list-style-type: none"> ➤ “Cheap electricity” ➤ Limited qualified Energy Servicing Companies (ESCOs) ➤ Limited qualified auditors and local technical capacity to identify savings and implement projects
Sustainable buildings	<ul style="list-style-type: none"> ➤ Electricity price hikes ➤ Eskom Standard offer ➤ PR opportunity 	<ul style="list-style-type: none"> ➤ Slow implementation of Measurement and Verification standards ➤ No regulatory requirement to enforce Energy Efficiency ➤ Lack of investment confidence ➤ Perceptions ➤ Limited awareness

Energy Efficiency

Sector	Opportunities	Challenges
Solar water heaters & heat pumps	<ul style="list-style-type: none"> ➤ Eskom DSM program and Standard Offer proposals ➤ Funding through Energy Servicing Companies structure 	<ul style="list-style-type: none"> ➤ Local ESCOs – skills and financial capacity ➤ Lack of reliable information or case studies ➤ Biased benefit accrual between landlord and lessee for buildings
Improvement in industrial processes EE	<ul style="list-style-type: none"> ➤ Clinton Climate Initiative ➤ Well established international EE practices ➤ South African commitment at Copenhagen ➤ Local manufacturing ➤ Can save 5 000 MW by 2016 ➤ Short time frame to implement ➤ Government target of 1 million SWH 	<ul style="list-style-type: none"> ➤ Project financing (ring fence?) ➤ Funding models: security, access to cash flows, non-tenant owners ➤ Industry standards for commercial buildings ➤ Funding of public entities (PFMA, MFMA) ➤ Reliable database of information for RSA conditions
Sustainable buildings	<ul style="list-style-type: none"> ➤ Carbon finance through Voluntary Emission Reduction (VERs) & Certified Emission Reduction (CERs) 	<ul style="list-style-type: none"> ➤ Legislation and tax and other incentives

Energy Efficiency: Some IDC initiatives

- **Commissioned study by E&Y (our partners; AfD and KfW)**
 - Focus on South Africa’s Energy Efficiency and Renewable Energy market
 - The demand study will assist IDC to target its **approach** towards the **EE & RE** sector and to assess **funding requirements** and investment focus areas.
- **Inputs on proposed standard offering**
 - Worked with other financial institutions to propose incentive level on **New Standard Offer** program for SWH.
- **IDC funding approved**
 - Solar Water Heater companies involved in the installation.
 - Funding for local manufacturers.
- **Retrofitting of buildings**
 - Close cooperation with well established **ESCOs and Clinton Foundation** to fast track investments in this field;
- **Accessing funding**
 - Engaging with international Development Finance Institutions on sourcing funds for green investments



Components of an Evacuated Tube Solar Water Heating System

Waste-to-energy

Sector	Main drivers & opportunities	Main barriers
Municipal solid waste	<ul style="list-style-type: none"> ➤ Supply security <ul style="list-style-type: none"> - obligation to reduce - enable expansion 	<ul style="list-style-type: none"> ➤ Municipal procurement process ➤ IDC not mandated to finance municipalities ➤ Slow progress with REFIT implementation ➤ Cost of investment
Municipal Sewage	<ul style="list-style-type: none"> ➤ Escalating tariffs ➤ Environmental pressure/responsibility 	<ul style="list-style-type: none"> ➤ Limited waste availability per site ➤ Long debt tenures required
Municipal and private landfill gas	<ul style="list-style-type: none"> ➤ To develop in-house or by IPPs ➤ Cost of disposal ➤ Renewable Energy Feed-in Tariff (REFIT) 	<ul style="list-style-type: none"> ➤ Not core business for the owner ➤ Projects too small for ring-fencing ➤ Lack of market- Corporate off-take ➤ Constraints on sale of electricity ➤ Low financial viability, capital costs, limited awareness
Animal waste	<ul style="list-style-type: none"> ➤ Clean development mechanism ➤ Produce methane for electricity generation or for compressed natural gas. 	<ul style="list-style-type: none"> ➤ Uncertainty over the contractual framework of Power Purchase Agreement (PPA) ➤ Threshold to qualify for REFIT (1 MW) ➤ PPP framework for the municipalities
Organic waste	<ul style="list-style-type: none"> ➤ Gasification or incineration of residue ➤ CER revenue for methane destruction and fossil fuel replacement ➤ In addition: Organic compost and organic fertiliser 	

Waste to Energy: IDC examples of projects

Project Development:

- Bankable feasibility study for a **Fresh Produce Market** to generate electricity from waste organic material.
- **Compressed Natural Biogas (CNG) pilot plant**, using Wet Fermentation technology, to produce CNG for use as a fuel and/or electricity substitute; with the plant serving the dual purpose of a training facility as well as being a commercial operation.
- Exploring CNG powered trucks and buses fuelled by Biogas plants.
- Opportunity for **municipal solid waste** as a unutilised source of energy,
- Flaring biogas from animal waste and generating Carbon Credits for sale by reducing methane
- Exploration of a **Biogas project** with the option to flare or sell the gas

Recycling and Waste Management

Recycled Products	Main drivers & opportunities	Main barriers
Municipal waste	<ul style="list-style-type: none"> ➤ Saving landfill space ➤ Minimal regulation of the industry ➤ Environmental preservation ➤ Cost of disposal are high ➤ Direct linkages with waste to energy projects may make recycling industry attractive ➤ High consumption areas like taverns, restaurants, hotels, stadiums, shopping centres, etc are a good opportunity for recycling 	<ul style="list-style-type: none"> ➤ High cost of recycled products vs virgin material ➤ Lack of proper regulation to encourage separation at source ➤ Many small applications – difficult to establish and fund ➤ The industry is still considered dirty and hazardous and requires proper skill and training ➤ Returns on investment are very low ➤ Room to improve regulation on imports and exports
Paper		
Cans		
Bottles		
Plastic		
Medical		
Chemical		
Electronic		
Ferrous/non-ferrous scrap		

Biomass to Energy

Category	Opportunities & Challenges	Projects/Partners
Wood Biomass waste	<ul style="list-style-type: none"> ➤ Access & collection of raw material ➤ Optimise wood waste to generate energy ➤ Opportunities for fuel switch projects ➤ Complicated processes wrt programmes (Working for Water and Working for Energy) ➤ Reluctance to upgrade/refurbish production processes under current economic conditions. ➤ Revenue through carbon finance, as well as gold standard classification. 	<ul style="list-style-type: none"> ➤ Working for Water & Energy Programme – Western Cape Biomass project, Robben Island Greening Project ➤ Project develop with boiler manufacturers ➤ Local and International Industry Players – co-generation and gasification projects ➤ First successful fuel switch project with existing IDC client
Wood pelleting	<ul style="list-style-type: none"> ➤ Energy crops to produce fibre for waste to energy or pelleting ➤ Integrated logistics supply model (joint shipping) and marketing opportunities between industry players ➤ Evaluate competitiveness and promote partnerships & knowledge sharing. ➤ Restructuring of current investments and lack of commitment from other shareholders. 	<ul style="list-style-type: none"> ➤ Current IDC investments in 2 pellet producers ➤ Restructuring approach with a strong emphasis on new industry development

Wind Power

Sector	Main drivers	Main barriers
Wind power	<ul style="list-style-type: none"> ➤ REFIT ➤ Wind potential in coastal areas –load factors ➤ Export drive of established International manufacturers 	<ul style="list-style-type: none"> ➤ Requires 6-12 months site specific data correlated to long-term meteorological data ➤ Onerous and lengthy EIA ➤ Little local capacity to manufacture, operate and maintain ➤ Capacity and SABS to develop standards for local manufacturing ➤ Slow progress with REFIT implementation, capacity allocation constraint on REFIT ➤ Slow progress with Integrated Resource Plan 2 (IRP2)

Sector	Opportunities	Projects
Wind power	<ul style="list-style-type: none"> ➤ Through a local turbine manufacturer to develop a generation project ➤ Develop local content in wind turbines ➤ Use local turbines in RSA and Africa ➤ Carbon income (CERs mainly) 	<ul style="list-style-type: none"> ➤ Involved in the development of 13 wind projects at various stages, mainly local projects.

Example : Project A (local manufacturer)

- **IDC wind project pipeline of 1 600MW**
- **>20 global wind turbine manufacturers**
- **Partner is the only RSA manufacturer**
 - Small, easy to construct, lower capital cost
 - Easy to transport to remote locations
 - Advanced design – “Generation IV” without gearbox
 - Higher efficiency due to low wind speeds required
 - Developed in South Africa and 90% local content
 - Manufactured components for 40 turbines = 12MW
- **BUT**
 - Unproven and developers and lenders won't finance
 - No orders yet
- **IDC's role:**
 - Facilitate / finance projects to utilise these turbine
 - External Technical Audit (International Consultant)
 - Co-develop: Luderitz; Lesotho ; Eastern Cape
Namakwaland
 - Participate with DST for up scaling turbine size.



Example of international project in Kenya

- **Project development and implementation funding of caR918 million approved for 300 MW**
- **First wind project approval for IDC**
 - Very attractive load factors
 - Targeting financial close by end of 2010
- **BUT**
 - Project in the Rest of Africa since the regulatory framework for PPAs in SA remains uncertain
- **IDC's role:**
 - Co-fund the project development and implementation phase
 - IDC facilitated the lead arranging role for the SA commercial banks in the project
 - Presented the project to other potential partners
 - Facilitated the introduction of an Independent power producer or Strategic Equity Partner to accelerate the project to financial close



Solar Energy:

Sector	Main drivers	Main barriers
❖ Photovoltaic	<ul style="list-style-type: none"> ➤ Knowledge of thin-film PV technology ➤ Assembly plants in South Africa ➤ Refit tariffs 	<ul style="list-style-type: none"> ➤ Very high investment cost ➤ Need to upgrade grid
❖ Concentrated Solar Power (CSP)	<ul style="list-style-type: none"> ➤ Excellent solar potential ➤ Refit tariffs 	<ul style="list-style-type: none"> ➤ Very high investment cost ➤ Requires large amounts of process water ➤ Lack of technology skills and manufacturing ➤ Need to expand grid connectivity

Opportunities

- Thin film technology development
- Off grid capped projects
- Carbon finance

Challenges: Awaiting NERSA's announcement of the RFP bids, water shortage.

Small Hydro:

Sector	Main drivers	Main barriers	Opportunities/Challenges
❖ Small hydro on existing dams	<ul style="list-style-type: none"> ➢ Water Affairs Department's engagements with National Treasury on PPP framework and bidding process ➢ Renewable Feed-in Tariff 	<ul style="list-style-type: none"> ➢ Exclusive access to the sites 	<ul style="list-style-type: none"> ➢ PPA uncertainty ➢ Off grid capped projects
❖ Other small hydro		<ul style="list-style-type: none"> ➢ Lack of technology skills and manufacturing ➢ Need to expand grid connectivity 	

Biofuels

The biofuels industry has been identified as a green industry that can play a meaningful role in job creation, fuel security, foreign exchange savings , rural development, development of downstream industries, etc.

Current initiatives:

Based on two government strategies: Biofuels Industrial Strategy, 2007 & IPAP II, 2009

IDC's involvement:

Currently supporting the development of the following bio-ethanol projects (around 100 million litres/a per plant):

- Sugar-beet & grain sorghum-to-ethanol project (in Cradock, Eastern Cape) - Project in **pre-implementation**
- Sugar-to-ethanol project in Hoedspruit, Limpopo - Project in **feasibility stage**
- Sugar-to-ethanol project in Makhatini, KZN - Project in **pre-feasibility stage**

Policy challenges:

- Mandatory upliftment (critical regulations required)
- Floor price support mechanism
- Clarity on water licensing issues

IDC approved projects and current pipeline

Approved projects		
Solar projects: Pre-feasibility phase		
Project A	Northern Cape	50MW
Project B	Northern Cape	125MW
Project C	Northern Cape	125MW
Wind: feasibility		
Local project (6 sights)	Western Cape	450MW
International project	Kenya	300MW
Waste to Energy: Pre-feasibility		
Project A	Gauteng	1MW
Project B	KZN	2MW

Energy Efficiency (SWH and vehicles)

- Solar Water Heater manufacturers and installers
- Electric car (Joule)

IDC total funding allocated for next 5 years

- R 11.7bn (Including early stage development funding, participating as equity player & funder in projects)

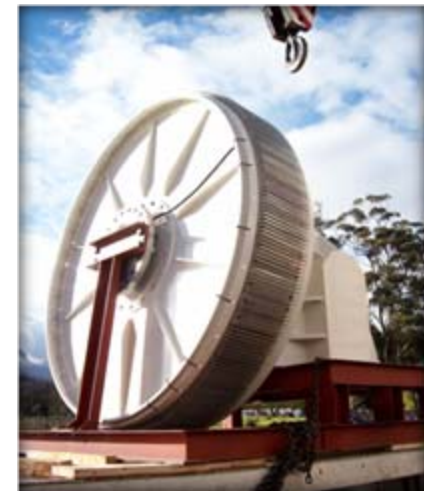
Pipeline	Nr of projects	
Renewable Energy		
Wind	11	1600MW
Solar CSP	3	192MW
Solar PV	4	21MW
Biogas	1	8MW
Hydro	1	4MW
Biomass to Energy	2	8MW
Energy Efficiency		
Co-generation	13	330MW
Retrofitting of buildings	5	
SWH	2	

General: Regulatory, procurement & stakeholders

- **Renewable Energy Feed-in Tariff:**
 - Selection criteria and procurement process
 - Standardised Power Purchase Agreements
- **Co-generation feed in Tariff (COFIT) regime:**
 - To be developed
- **Finalisation of Integrated Resource Plan 2 (IRP2):**
 - To provide power generation mix framework for next 20 years.
- **Standard Offer Programme:**
 - By DoE for Solar Water Heaters
- **Energy Efficiency Demand Side Management rules**
 - Finalisation for Standard Offer Program for Energy Efficiency (including publication of qualifying technologies)
- **Independent Power Producers framework**
 - Development of legislation for the creation of the Independent Systems and Market Operator
- **Implementation of SANS 204**
 - Improving Energy Efficiency in Buildings

Regulatory and procurement

- **Update of South African National Energy Efficiency Strategy**
- **Development of ISO 50001/SANS 50001**
 - Energy Management Systems
- **Clarity on role of Carbon Tax**
- **Tax/subsidy support for green initiatives**
- **Completion of SATS 50010**
 - Measurement and Verification of Energy Savings standard
- **Amendment of South African Income Tax Act**
 - to allow for deductions for Energy Efficiency measures
- **EIA's**
 - Improvement on processes & requirements
- **License application process**
 - Changes to process requires new application process
- **Capacity at local Designated National Authority:**
 - Specifically related to programmatic Clean Development Mechanisms projects
- **Public Finance Management Act and Municipal Finance Management Act constraints**



Need for greater cross-Govt co-ordination/co-operation

• Institutional players:

- IDC
- DBSA
- Khula
- SAMAF
- NEF
- ITAC
- Competition Authorities
- PIC
- SARB

• Energy specific:

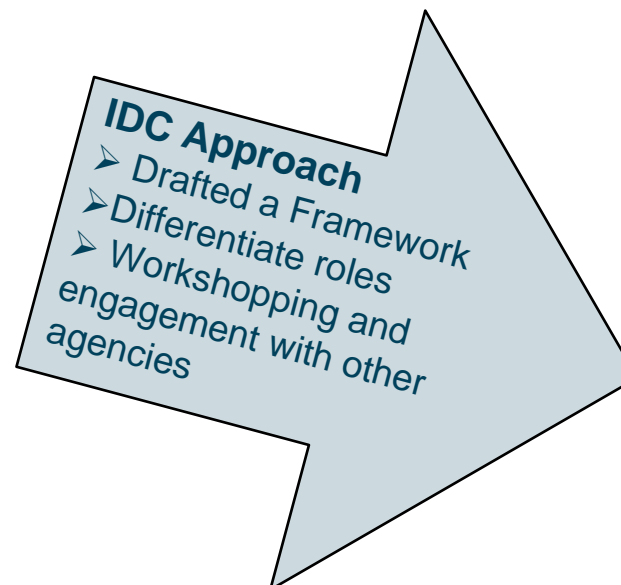
- CEF
- Sanedi
- NERSA
- Eskom

Government dept:

- EDD
- DEAT
- DOE
- DWEA
- DAFF
- DPE
- DST
- DTI

IDC's role in coordinating green initiatives:

- Skills development & priorities
- Lead from the front through example
- Assist in clarifying relationships and roles
- Mobilise funding for green initiatives (eg. other DFIs, foreign Governments, etc, tax)



Challenges

- Green economy is not the focus of all players;
- Expectations;
- Some may have conflicting mandates.



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Thank you

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