


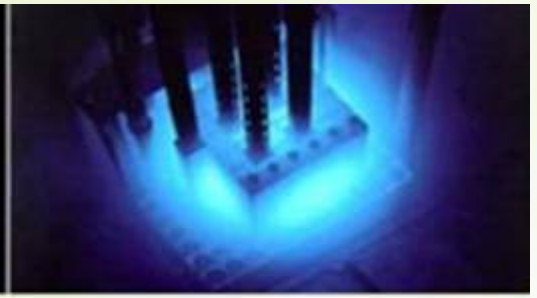


Department of Energy

OUR JOURNEY TOWARDS 2030

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DIRECTOR GENERAL, DOE, RSA

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Outline of presentation

1. Macro-Economic Overview of South Africa
2. Overview of the South African Electricity Industry
3. Summary of the Policy Adjusted IRP
4. Implementation of the IRP2010
5. SAPP Future Energy Outlook

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1. Macro-economic overview of South Africa

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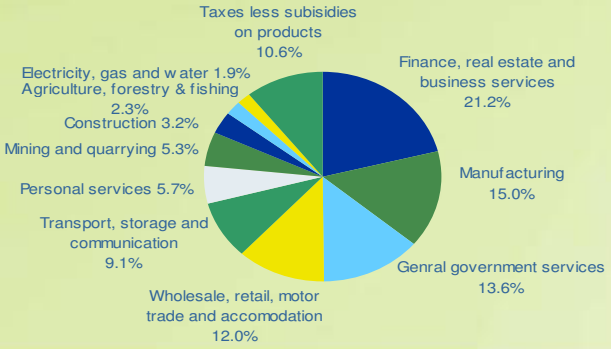
Macro-economic overview of South Africa
Key macro economy indicators

Key facts

- South Africa is Africa's largest economy and the 25th largest economy globally
- Real GDP is expected to grow at 3.7% in 2011
- South Africa's Net Public debt to GDP ratio (33%) is relatively low compared to comparative countries. In addition, the Government expects the fiscal deficit to narrow to 5.4% of GDP in 2010/11, and 4.7% in 2011/12
- The state plans on investing $114.31bn over the next three years on economic and social infrastructure

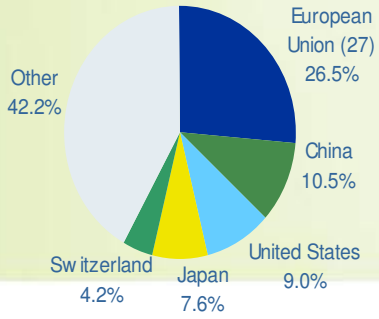
Nominal GDP vs Real GDP growth

GDP contributors

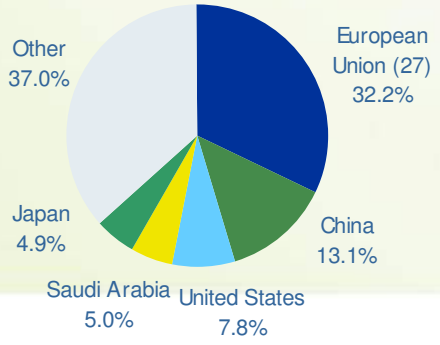


Main trading partners

Main share of exports



Main share of imports



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Macro-economic overview of South Africa
Key macro economy indicators

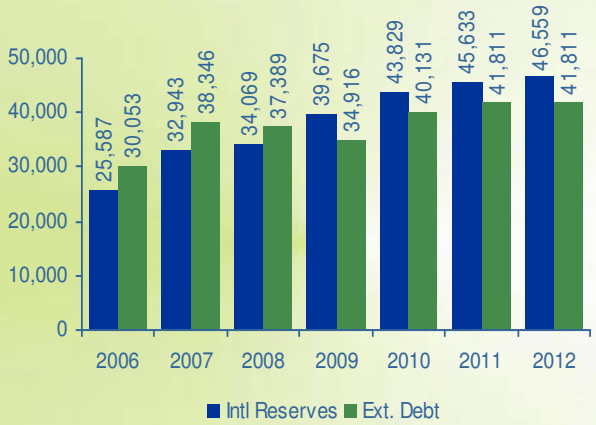
Current account deficit is expected to widen to 5.5% of GDP in 2011 (2010: 3.9%) as exports fail to keep up with imports owing to fragility in OECD markets

Gradual depreciation of the currency is expected during 2011 because of indirect action by the authorities to weaken the Rand (by building foreign-exchange reserves)

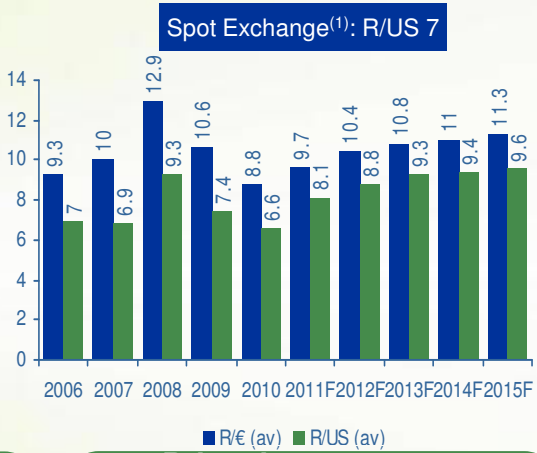
Interest rates are currently at a 35 year low

Outlook of South Africa's economy is rated stable, Fitch cited the smoother than expected recovery from the recession

Reserves and external debt



Exchange rate forecasts

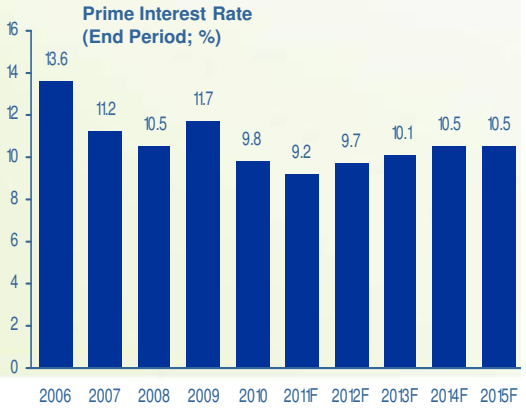


Credit ratings

	Moody's	Standard & Poor's	Fitch Ratings
Foreign Currency Long-Term Debt	A3	BBB+	BBB+
Local Currency Long-Term Debt	A3	A	A
Foreign Currency Short-Term Debt	P-2	A-2	F2
Local Currency Short-Term Debt	NR	A-1	NR

Government net debt (total and as % GDP)

Prime interest rates forecasts



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2. Overview of the South African electricity industry

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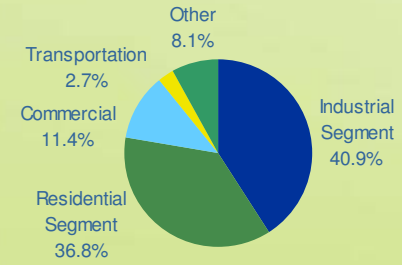
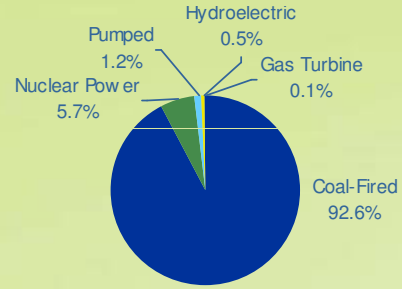
Overview of the South African electricity industry: Sources of power

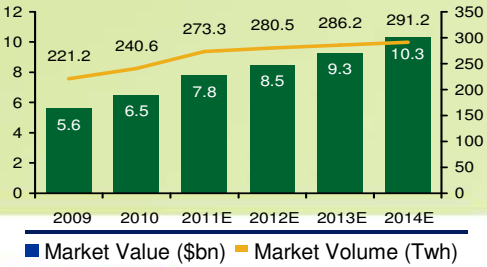
Electricity consumption



Electricity production[1]



Electricity market



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Overview

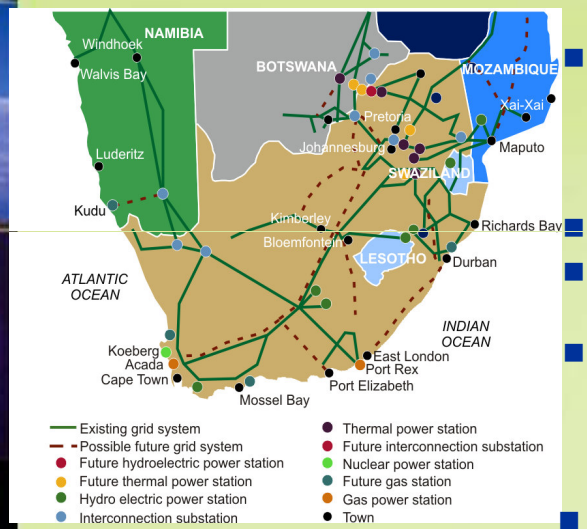
- Electricity market grew by $1.4bn in 2009 to reach $5.6bn
- Electricity generation dominated by state-owned power company Eskom[2], which currently produces over 96.7% of the power used in the country
- Eskom has a current nominal installed capacity of 44,175MW
- Government addressing electricity supply issues with Eskom and Independent Power Producers (“IPPs”)
- South Africa needs over 40,000 MW new generation capacity by 2025
- Eskom is part of Southern African Power Pool, a group of utilities in the region aiming to create a common market for electricity in the region

Transmission and Distribution Overview

- Currently, the transmission of electricity in South Africa is undertaken by Eskom
  - The company has over 28,000km of transmission lines spanning the entire country
- Electricity distribution is the final stage in the delivery of electricity to end users, currently undertaken by Eskom, together with 187 municipalities
  - Municipalities account for c.40% of the total electricity sales and c.60% of the customer base

Overview of the South African electricity industry: Sources of power (cont'd)

Eskom Power Grid[1]



Coal power

- c.93% of power in South Africa is generated from coal fired power stations
- South Africa is the 5th largest coal producing country in the world with coal reserves of 30,408mt (3.68% of world total)
- Coal accounts for 86% of Eskom's nominal current capacity (37,755MW)

Nuclear power

- Only one nuclear power station (Koeberg), a base-load station with a nominal installed capacity of 1,930MW (c.5%)
  - Construction for the plant began in 1976 and full operation in 1985
  - Produced 12,806 GWh electricity in year ended 31 March 2010
- Uses c.30tpa of enriched uranium
- Government authorized contracts in place to supply Koeberg for the next 8 years
- It is intended that nuclear will comprise 17% of South Africa's base load energy mix by 2030

Hydro-electric, Gas fuel and Renewable Projects

- Hydro-electric power stations account for less than 2% of nominal installed capacity, while the gas/liquid fuel turbine accounts for c.6%[2]
- With assistance from the World Bank, plans currently in place for the development of a 100MW Sere wind power project, as well as the Upington concentrating solar thermal power (CSTP) project, covering 4km^2
  - Should the CSTP project prove to be commercially feasible, a larger facility could be constructed

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Overview of the South African electricity industry: Regulatory environment

National Energy Regulator

- National Energy Regulator (NERSA) regulates the South African electricity industry
- NERSA licences electricity generation, transmission, distribution and trading activities in South Africa
- NERSA sets tariffs based on its Multi-Year Price Determination Methodology (MYPD)
  - Annual revenues are set for a three year period currently from 1 April 2010 to 31 March 2013

Electricity Pricing Policy

- In November 2008, the Government approved the Energy Pricing Policy (EPP) which sets the determination of regulated revenues going forward
  - Future regulated revenues will be based on the replacement value of its assets
  - Ensures long-term sustainability of the industry to fund future capacity expansion requirements
- EPP aims to reach cost-reflective tariffs that will reflect the full economic cost of supplying electricity to a customer
  - EPP determines a 5 year transition period that will end in FY2015 to reach cost-reflective tariffs

Department of Energy

- Department of Energy is mainly responsible for electricity generation planning via Integrated Resource Plan (IRP), which determines electricity generation capacity expansion requirements in South Africa
  - Objective is to develop a sustainable electricity generation capacity over the next 20 years
  - Sets capacity requirements by energy source that will be provided by Eskom and other IPPs
  - NERSA can only license a power station that is built in accordance with the IRP

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3. The Integrated Resource Plan 2010

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Overview of the IRP 2010

- The policy objective of the IRP is to determine South Africa's long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost
- the 1st draft of the IRP was the Revised Balanced Scenario (RBS) of energy supply options published by the department in 2009
- The Final IRP2010 is a result of modelling changes to the RBS as a result of extensive public participation processes
- The Final IRP2010 (Policy-Adjusted IRP) represent a trade-off between:
  - Least investment cost and consideration for economic growth
  - Climate change mitigation
  - Diversity and security of supply
  - Job creation
  - Sustainable development

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Objectives of the IRP 2010

- The objective of the IRP is to develop a sustainable electricity investment strategy for South Africa over the next 20 years
- Strategy encompasses both implications from demand-side management and pricing as well as capacity provided by generators
- The intent of the IRP is to:
  - Improve the reliability of electricity generation
  - Ascertain South Africa's capacity investment needs
  - Consider environmental impacts and the effect of renewable energy technologies
  - Provide a framework for the Ministerial determination of new generation capacity

*IRP is **a "living" plan**, which will be updated on an ongoing basis to reflect the changing needs of South Africa and to learn from the inevitable changes in South Africa's economical, social and technological environment*

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Policy-Adjusted IRP South Africa's generation mix

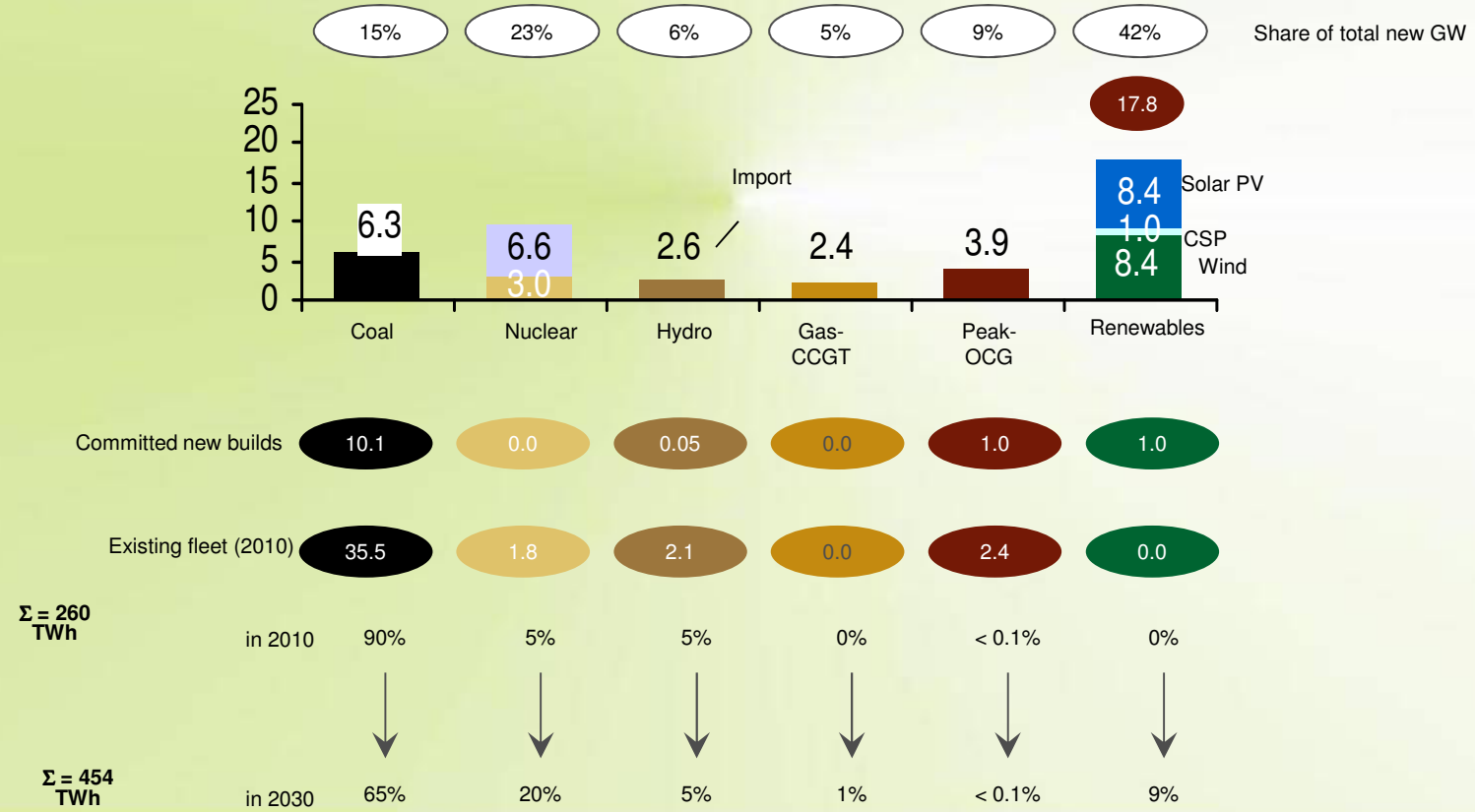
	Committed Build											New Build Options								
	RTS Capacity	Medupi	Kusile	Ingula	DOE OCGT IPP	Cogeneration, Own Build	Wind	CSP	Landfill, Hydro	Sere	Decommissioning	Coal (PF, FBC, Imports, own build)	Gas CCGT	Peak-OCGT	Import Hydro	Wind	Solar PV	CSP	Nuclear Fleet	Total New and Committed Build
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
2010	380	0	0	0	0	260	0	0	0	0	0	0	0	0	0	0	0	0	0	640
2011	679	0	0	0	0	130	200	0	0	0	0	0	0	0	0	0	0	0	0	1,009
2012	303	0	0	0	0	0	200	0	100	100	0	0	0	0	0	0	300	0	0	1,003
2013	101	722	0	333	1,020	0	300	0	25	0	0	0	0	0	0	0	300	0	0	2,801
2014	0	722	0	999	0	0	0	100	0	0	0	500	0	0	0	400	300	0	0	3,021
2015	0	1,444	0	0	0	0	0	100	0	0	(180)	500	0	0	0	400	300	0	0	2,564
~~2016~~	~~0~~	~~722~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~(90)~~	~~0~~	~~0~~	~~0~~	~~0~~	~~400~~	~~300~~	~~100~~	~~0~~	~~1,432~~
2017	0	722	1,446	0	0	0	0	0	0	0	0	0	0	0	0	400	300	100	0	2,968
2018	0	0	723	0	0	0	0	0	0	0	0	0	0	0	0	400	300	100	0	1,523
2019	0	0	1,446	0	0	0	0	0	0	0	0	250	237	0	0	400	300	100	0	2,733
2020	0	0	723	0	0	0	0	0	0	0	0	250	237	0	0	400	300	100	0	2,010
2021	0	0	0	0	0	0	0	0	0	0	(75)	250	237	0	0	400	300	100	0	1,212
2022	0	0	0	0	0	0	0	0	0	0	(1,870)	250	0	805	1,143	400	300	100	0	1,128
2023	0	0	0	0	0	0	0	0	0	0	(2,280)	250	0	805	1,183	400	300	100	1,600	2,358
2024	0	0	0	0	0	0	0	0	0	0	(909)	250	0	0	283	800	300	100	1,600	2,424
2025	0	0	0	0	0	0	0	0	0	0	(1,520)	250	0	805	0	1,600	1,000	100	1,600	3,835
2026	0	0	0	0	0	0	0	0	0	0	0	1,000	0	0	0	400	500	0	1,600	3,500
2027	0	0	0	0	0	0	0	0	0	0	0	250	0	0	0	1,600	500	0	0	2,350
2028	0	0	0	0	0	0	0	0	0	0	(2,850)	1,000	474	690	0	0	500	0	1,600	1,414
2029	0	0	0	0	0	0	0	0	0	0	(1,128)	250	237	805	0	0	1,000	0	1,600	2,764
2030	0	0	0	0	0	0	0	0	0	0	0	1,000	948	0	0	0	1,000	0	0	2,948
	1,463	4,332	4,338	1,332	1,020	390	700	200	125	100	(10,902)	6,250	2,370	3,910	2,609	8,400	8,400	1,000	9,600	**45,637**

Firm commitment necessary now

Firm commitment in IRP 2012

Summary of the IRP: Generation Capacity

Policy-Adjusted IRP: New Build Programme



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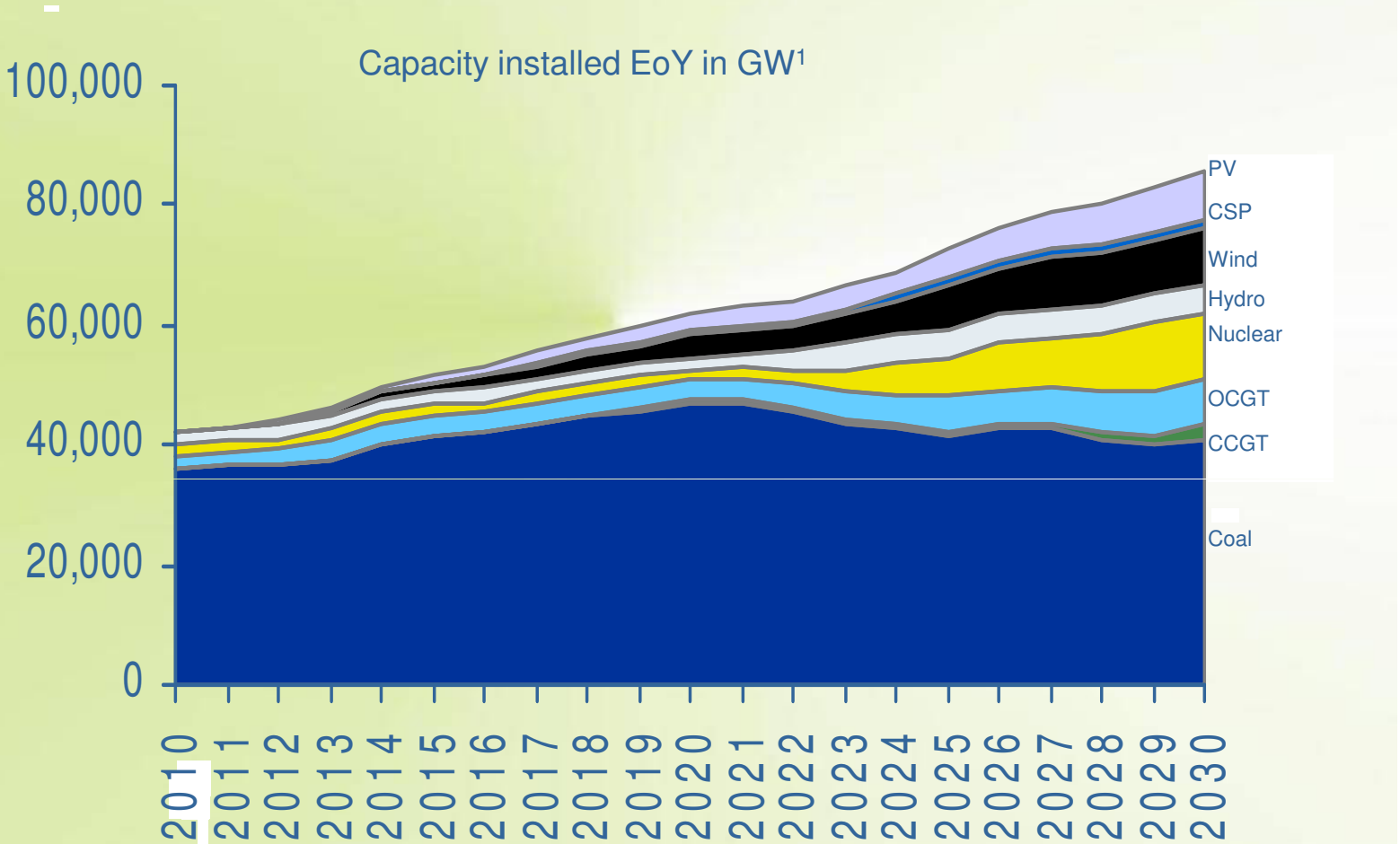
IRP 2010 Generation Mix towards 2030



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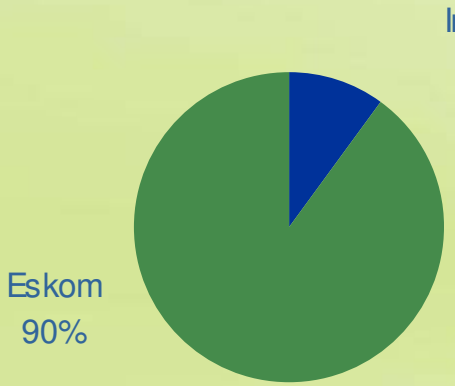
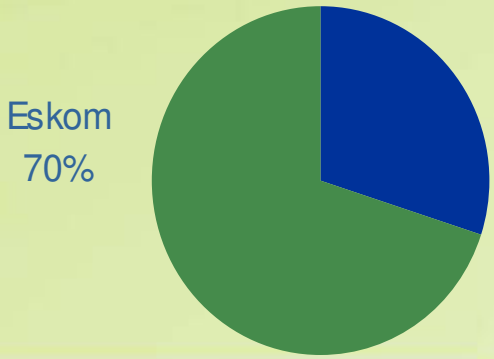
An increased role of IPPs in the power industry

Short – term generation capacity targeted



Long – term generation Capacity targeted



Overview

- Independent power generation in South Africa will play a better role going forward
  - Renewable energy generation
  - Self-generation
  - Cogeneration- the production of power using waste energy from industry processes in electricity generation, either for self-use or for contribution to the grid
  - More conventional forms of generation, such as coal-fired facilities
- Key benefit for IPPs include:
  - The relative speed at which that they can be brought to steam
  - The resource burden on Eskom is alleviated (Eskom is not responsible for either financing or building the facilities)
  - Large part of the IPP programme is intended to facilitate the introduction of “green” power which will improve South Africa’s renewable energy profile

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4. IMPLENTATION OF THE IRP 2010

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Independent System and Market Operator Bill

Establishment & Objectives

- The ISMO will be an operator of the National Electricity Transmission System who buys electricity from generators and sells it to customers at a wholesale level
- Objectives:
  - Leverage private capital and spread the risk appropriately amongst all parties
  - Create a fair, transparent and non discriminatory trading environment between IPPs and Eskom where a credible and non-conflicted buyer handles the transactions
  - Renewables to be combined with gas, coal or nuclear, though with less firmly committed nuclear new builds from first IRP (9.6GW → 3.0GW)
  - Mitigate a security of supply risk
  - Facilitate non-discriminatory access to the Transmission Grid by all generators and distributors and ensure a fair environment for scheduling and dispatching of power from all generators
  - IPP's
    - Create a platform to bring IPPs onto market as soon as possible
    - Streamline the IPP procurement process
    - Attract IPP's to complement Eskom's generation and address perceptions about conflicted role of Eskom as a simultaneous generator and buyer of electricity

Approach to Implementation

- Phase 1 (Drafting of the Bill) - March 2011 to December 2011
  - The Draft Bill has been approved by Cabinet. The Bill closed for public comments on the 13 June 2011
  - The Bill should be introduced to the parliamentary process before the end of the year, 2011
- Phase 2 (Making ISMO Operational) – July 2013
  - Includes the transfer of functions, human resources and systems
- Phase 3 (ISMO in operation – without transmission assets) January 2014
  - A fully populated and operational ISMO

Targeted Outcome

- ISMO will be a fully Public Entity legally separate from Eskom with four distinct functions:
  - Planning (Integrated Resource Planning)
  - Buying (from Eskom and IPP's)
  - Wholesale tariff aggregation
  - Dispatch

The Department of Energy has decided to undertake a phased-in process

Renewable Energy Procurement Process

- 1st RE procurement for 3 725MW of Renewable Energy
  - 1 800MW Wind
  - 1 400MW Solar
- Request for qualifications and proposals issued 31 July 2011
- Bidder's conference held on 14th September 2011
- Five phase bidding process with 1st Phase closing date: 4 November 2011
- Subsequent bidding phases only available if the 1st phase is not oversubscribed

Source: Research Channel, Electricity Review South Africa, February 2011, DoE IRP Process Document

5. SAPP FUTURE ENERGY OUTLOOK

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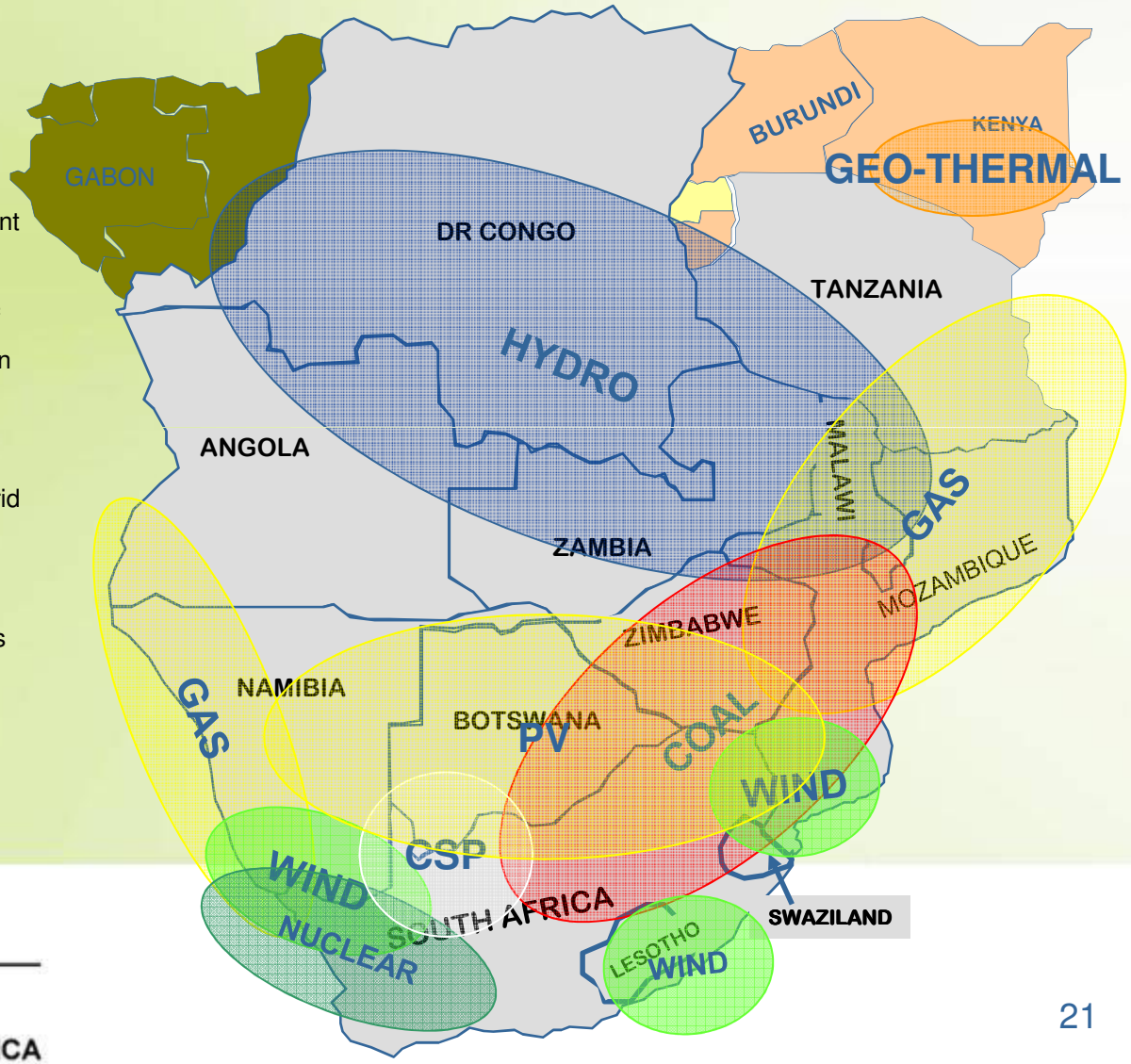
Energy Resources in the Region

Research Agenda for IRP 2012

- Decision making under uncertainties and risk assessment for key IPR scenarios
- Outlook for 2050- implications of further greenhouse-gas reduction in primary energy mix for all sectors on the power sector
- Distributed generation and off-grid generation (island grids)
- Grid integration of fluctuating renewables including smart grids and role of storage



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Thank you

Gracias

Obrigado

Grazie

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