



Renewable Energy Wind Energy

South African Market

Präsentation für Seminar Windenergie

GO SOUTH, Semlin 3.6.2010





Economy

48 m people (*Germany 82 m*)

- GDP

- \$ 287 bn (*\$ 3 360 bn*)
- 2008: 3.1% (*1.3%*)
- 2009: -1.8% (*-4.9%*)
- 2010e: 2.9% (*1.5-1,8%*)
- 2011e: 3.7%
- 2012e: 4.1%
- 25% of Africa's GDP

- Budget

- 2008: +0.6% (*-0.1%*)
- 2009: -3.9% (*-3.1%*)
- 2010: -6,5%

- Inflation targeting

- 3 – 6 %
- Within target until mid 2011

- Public debt

- 2009: 35.7 % (*73.4 %*)

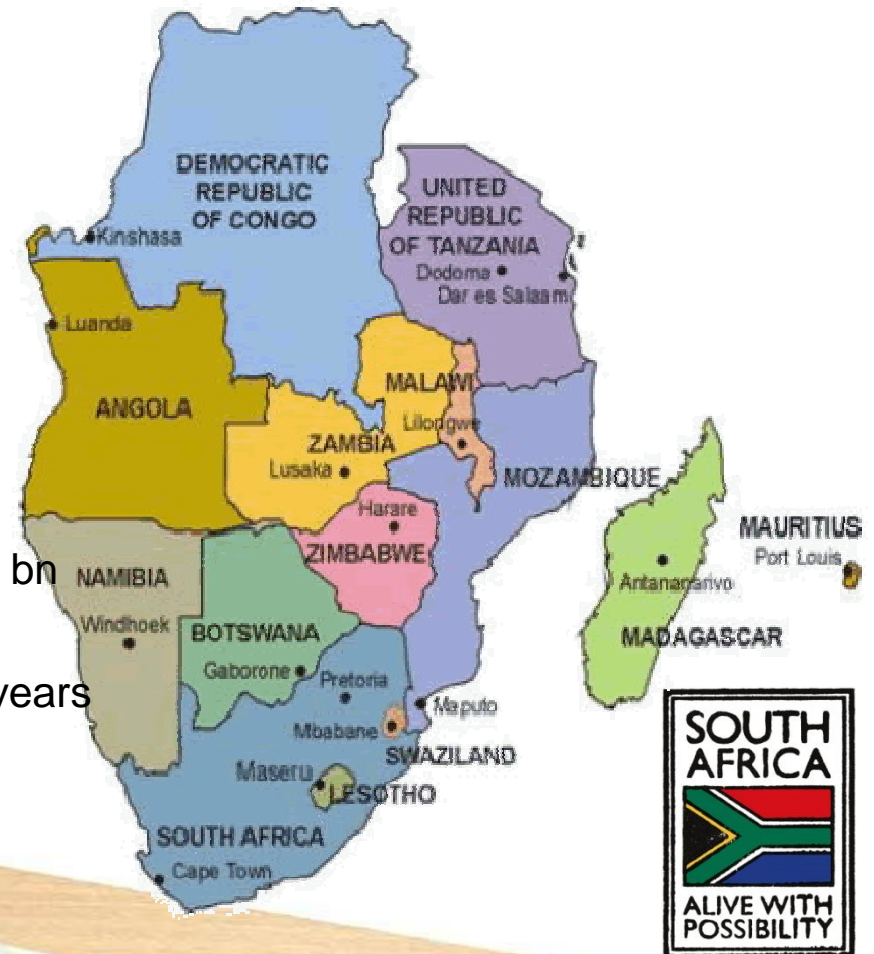
Source: Destatis(10), BJM (Jan 10),
Standard Bank (May2010),
Treasury (May10) Reservebank (Meh10)





Economy

- FDI
 - South Africa \$ 120 bn, 29th
 - India \$ 144 bn, 23rd
 - Germany \$ 1 027 bn, 5th
- JSE (18th) > Milano
- Energy production (14th) (6th)
 - > Brazil, India, China per capita
- SADC Free Trade Area
 - \$ 360 bn market, 170 m people
 - Angola & DR Congo expected to join
 - \$ 71 bn, 77 m people
- Infrastructure Investment Programme: R 846 bn
- Industrial Policy Action Plan (Feb 2010):
825 000 direct & 2.5 m indirect jobs over 10 years
- G20





Economy

- Country credit rating
 - 33rd China, 47th Brazil, 50th Russia, 51st India, 52nd South Africa
- Financial market sophistication 5th (*Germany 36th*)
- No. of procedures required to start a business 26th (*75th*)
- Efficiency of legal framework 18th (*17th*)
- Property rights 20th (*9th*)
- Reliance on professional management 21st (*15th*)
- Quality of air transport infrastructure 23rd (*4th*)
- Firm-level technology absorption 33rd (*14th*)

Sources: Euromonitor, World Economic Forum (.09), GTAI (Sep .09)





What led to current situation?

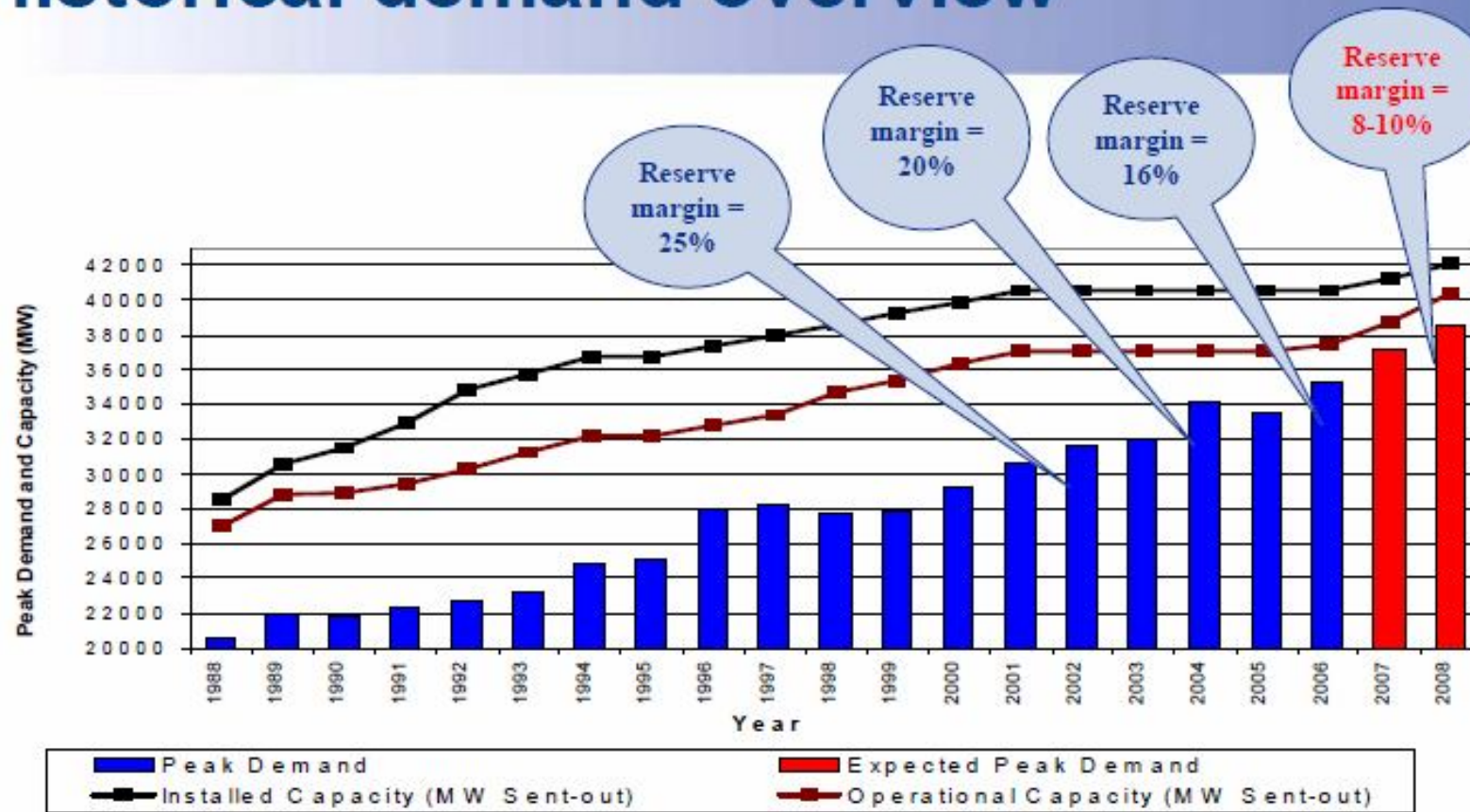
- Late Start of new build programme
- Insufficient reserve margin
- Medium term planning effectiveness
- Demand growth – 50% increase from 1994 to 2007





Enough Energy?

Historical demand overview



Reserve margin aspiration = 15%





Fill the Gap (2008)

Current Planned Capacity Expansion (MW)										
Project	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Camden (Return-to-Service)	390	390								780
Grootvlei (Return-to-Service)		585	585							1 170
Komati (Return-to-Service)		120	240	320	285					965
Ankerlig (Open Cycle Gas Turbines)	589		740							1 329
Gourikwa (Open Cycle Gas Turbines)	439		296							735
Amot Upgrade (Coal-fired)	75	60	60	30						225
Medupi (Coal-Fired)						798	1 596	798	1 596	4 788
Ingula (Pumped Storage)						666	666			1 332
Bravo (Coal-fired)							803	1 606	803	3 212
Wind Farm (Renewable)				100						100
Co-generation*			500	1 000	1 000	1 000				3 500
IPP (OCGT)				1 000						1 000
Annual Total	1 493	1 155	2 421	2 450	1 285	2 464	3 065	2 404	2 399	19 136





Target*

- 10 000 GWh by 2013
 - 4 000 GWh off-grid
- 1 667 MW
- 241 400 GWh total energy consumed in 2007
- 20 000 Jobs
- More access and equity for all South Africans

* www.dme.gov.za/pdfs/energy/renewable/white_paper_renewable_energy.pdf





Potential

- 36 % of total energy consumed*

	GWh	%
Biomass	6 556	7.5
Hydro	9 245	10.6
SWH	6 940	8.0
Wind	64 102	73.8
Total	86 843	100

* excl. biofuels, solar thermal (X0 000 MW), wave energy





Status

- **Grid**
- **Current energy projects**
- **Feed-in-Tariff (REFIT)**
- **Requirements**
- **Wind Energy Program (SAWEP)**

Other - DoE Grants

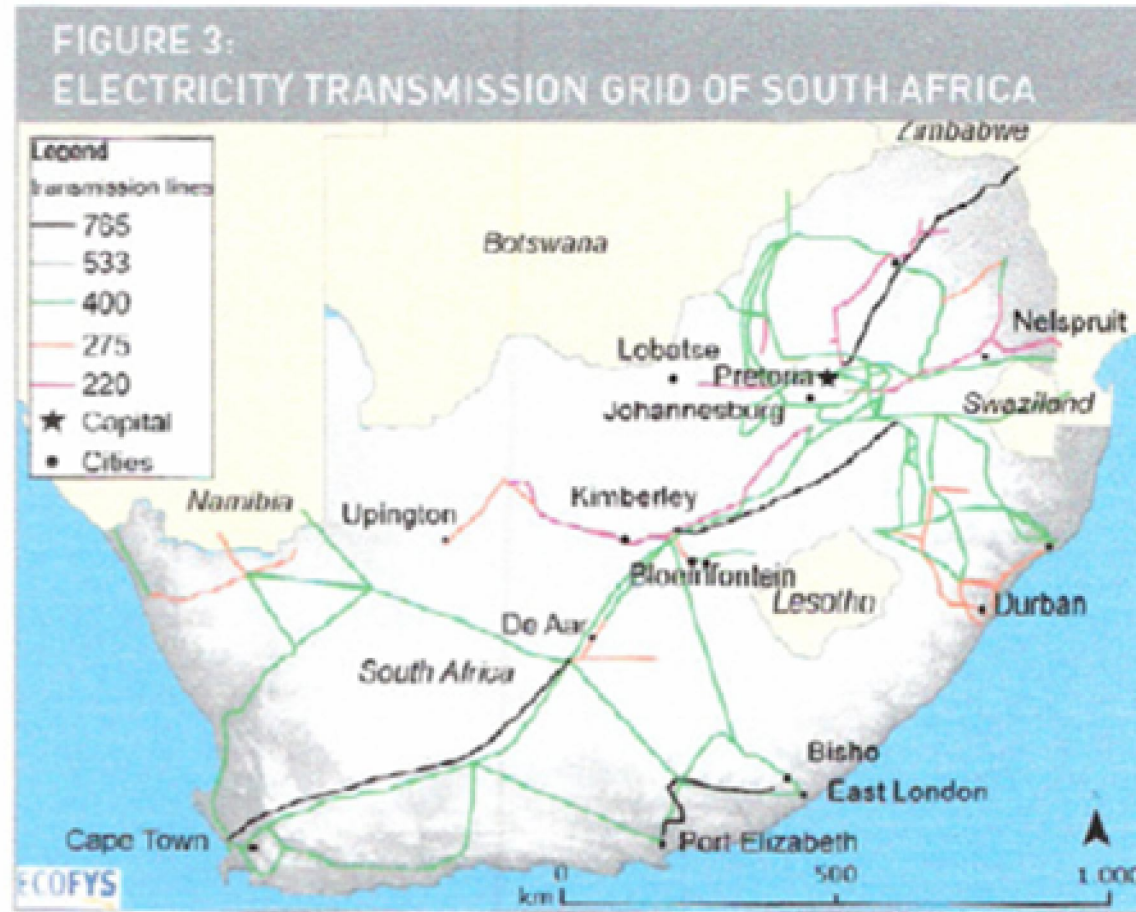
- **Tradable Certificates (TREC)s**
- **Market Transformation (REMT)**
- **Incentives**

- [http://www.reservebank.co.za/internet/Publication.nsf/LADV/3F36607965A81CD1422576EB004662F7/\\$File/KI032010.pdf](http://www.reservebank.co.za/internet/Publication.nsf/LADV/3F36607965A81CD1422576EB004662F7/$File/KI032010.pdf)





Grid

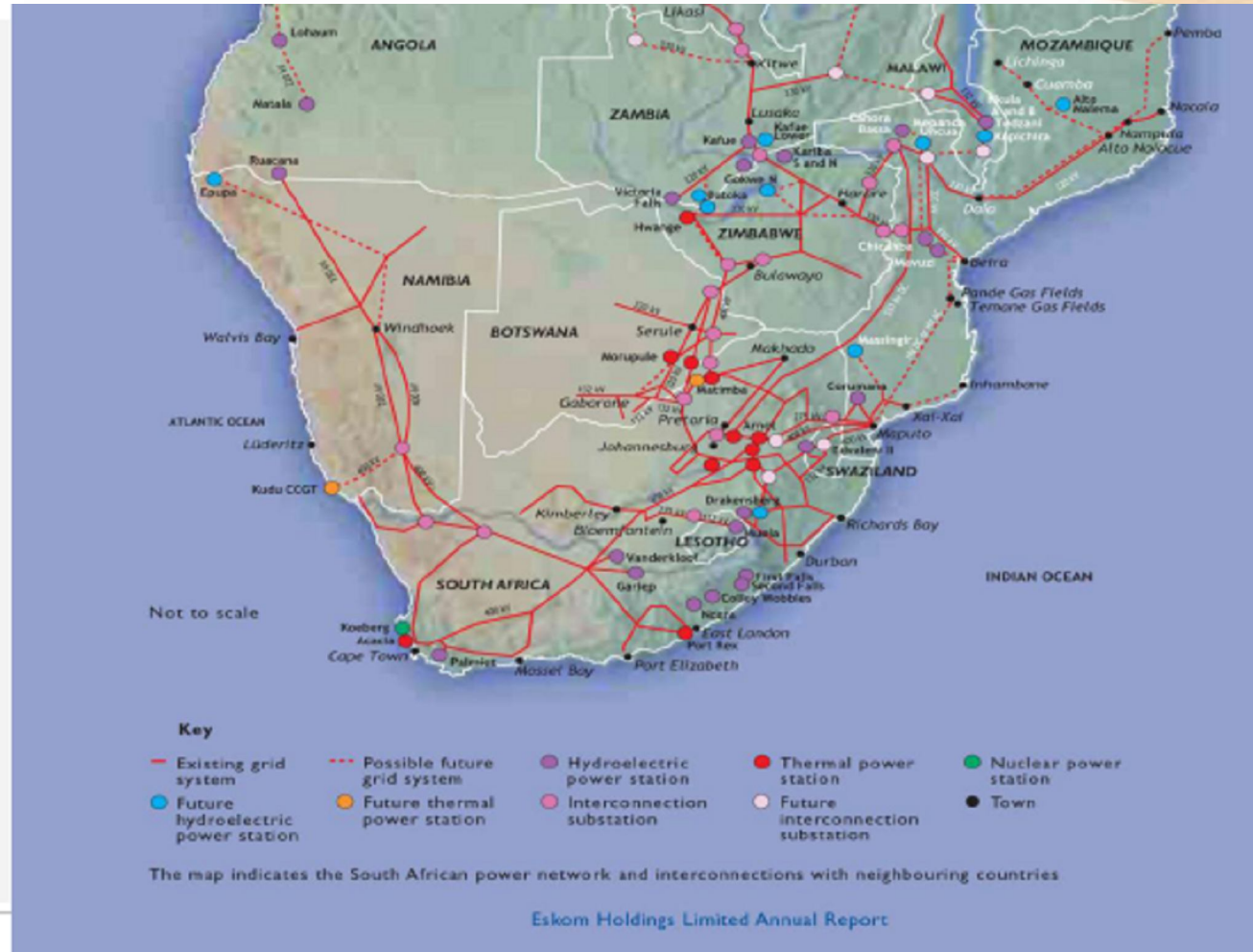


Data Source: CGIAR 2004





Status Production & Grid





Projects

- R 385 bn by Eskom
- Wind farms
 - Helena Bay (Western Cape), 50 MW, R 850 m
 - WC Gov, Saldanha municipality, Seeland Development Trust, Oxfam (UK), Genesis Eco-Energy
 - Vredendal (WC) 200 MW, > € 100 m, by 2010
 - Overberg / Caledon (WC) 300 MW, announced 2010
 - Coega /PE (EC) ca. €120 m, 57 MW, announced 2010
 - Darling (WC), 5 MW, \$ 75m, 2008
 - Darling Independent Power Producer, CEF, DBSA
- Solar
 - Demo plant (Northern Cape), 100 – 1 000 MW, by 2014, R 5 bn
- Hydro
 - Ingula (Free State/KwaZulu-Natal), 1 368 MW, by 2013, R 16.6 bn
- Cogeneration (IPPs)
 - 3 500 MW, by 2012
 - add. 5 – 10 000 MW, by 2018





Projects

- Coal-fired

- Kusile (Mpumalanga), 4 818 MW, by 2017, R 111 bn
- Medupi (Limpopo), 4 800 MW, by 2012, R 120 bn
- Fluidised-bed power plant (discard-coal) (KZN) 540 MW, R 5-8 bn, 2012
 - Umbani Power (Aldwych, IDC, African Infrastructure Investment Fund, Rainbow Millennium Power)
- Return-to-service
 - Camden (ML), 1 620 MW, by 2011, R 5.2 bn
 - Grootvlei (ML), 1 200 MW, by 2011, R 4.8 bn
 - Komati (ML), 1 000 MW, by 2011, R 6.1 bn

- Gas-fired

- Gas One Atlantis (WC), add. 750 MW, R 4.2 bn (Gas One total)
- Gas One Mossel Bay (WC) add. 300 MW, R 4.2 bn (Gas One total)
- Sasol (ML) 280 MW, R 2.5 bn

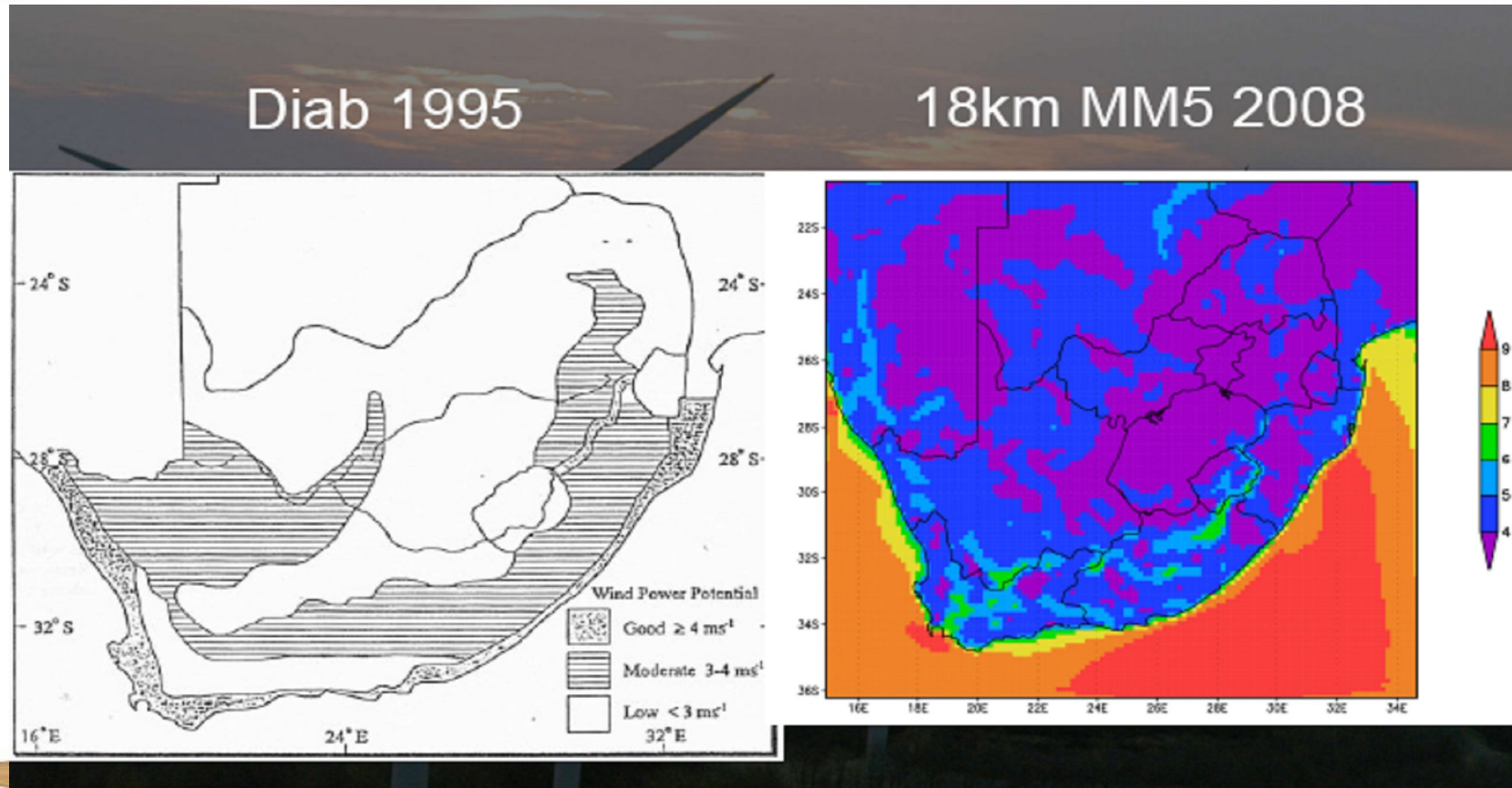
- Nuclear

- Demo plant (WC), 400 MW, by 2016, R 31 bn
 - Eskom, IDC, Westinghouse (US)





Wind Speed Factors: Av. 10 m W.Speed Maps I



Source: Mesoscale Wind Atlas of South Africa, K. Hagemann, Climate Systems Group Univ. Cape Town, March 2009

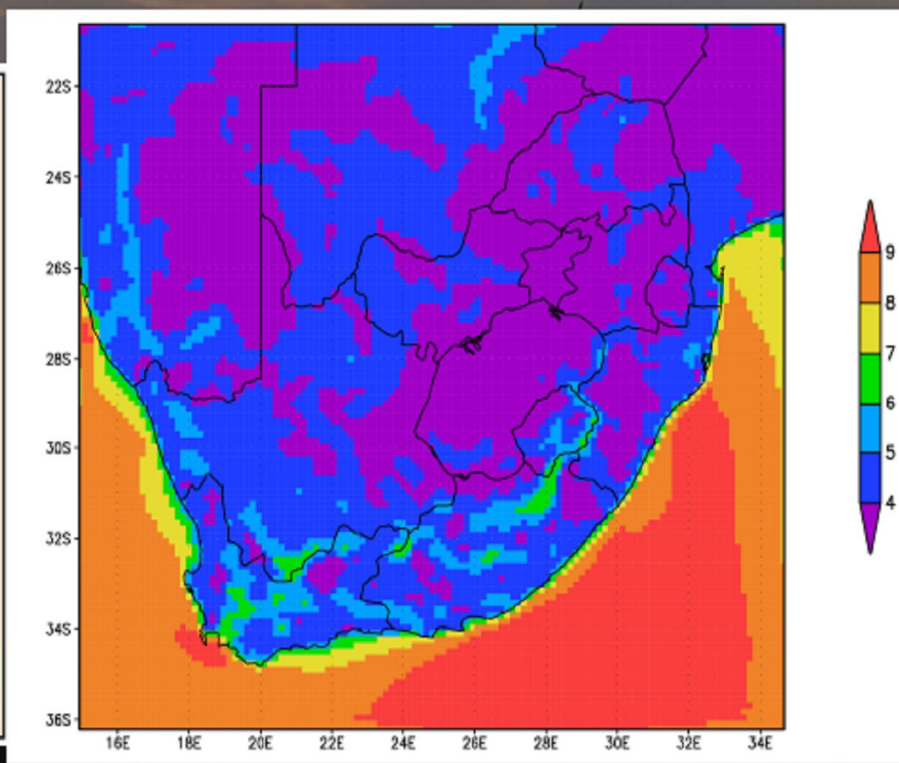
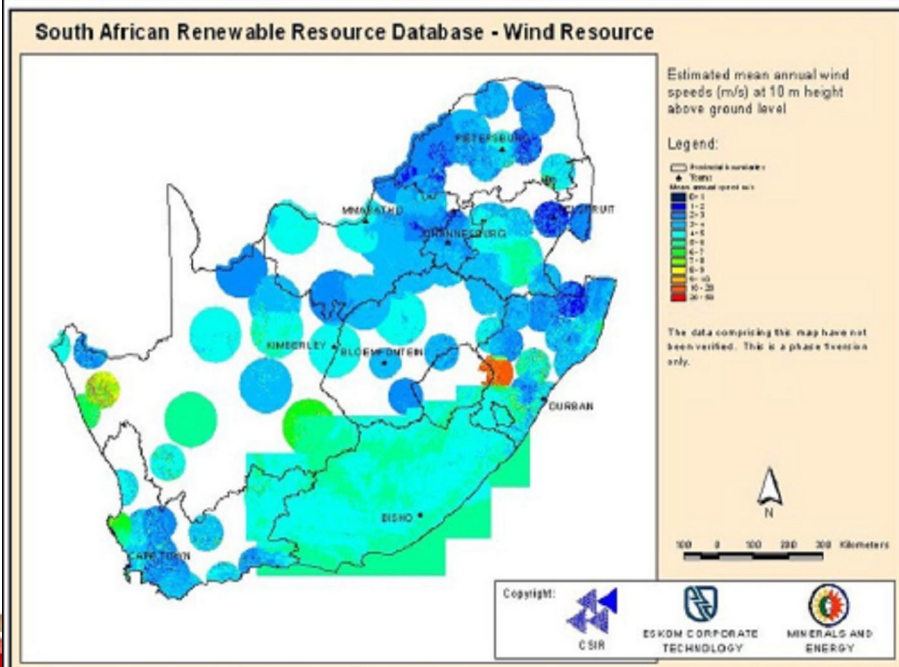




Wind Speed Factors: Av. 10 m W.Speed Maps II

Eskom/CSIR 2001

18km MM5 2008



Source: Mesoscale Wind Atlas of South Africa, K. Hagemann, Climate Systems Group Univ. Cape Town, March 2009

ALIVE WITH
POSSIBILITY



REFIT

- Set by NERSA
- Administered by Eskom
- 26 March & 2 Nov 2009
- 20 years
- No reduction
 - CPI-adjusted for running PPAs
- Avg. electricity price '08
 - R 0.25 / kWh
 - Industry: € 0.09 / kWh
 - Consumer: € 0.13 / kWh

Phase	Technology	R / kWh
1	Wind	1.25
1	Small-scale hydro	0.94
1	Landfill gas	0.90
1	CSP*	2.10
2	CSP* trough w/o storage	3.14
2	CSP* Tower w/ 6h/day storage	2.31
2	Grid PV \geq 1MW	3.94
2	Biomass solid	1.18
2	Biogas	0.96

* \leq 15 % fossil fuel input for CSP





Time Window

- Renewables: Nersa REFITs: 20 yr PPAs with min. PPA 10 yr (subject to certain cond's)
- REFIT tariffs reviewed ev. Yr in first 5 yrs and every 3 years thereafter (new contracts).
- New Gov't Wind energy strategy in 2011





Requirements

- **Grid compatibility study (~ 3 months)**
- **Land acquisition (~ 3)**
- **EIA incl. change of land use right (~ 12)**
- **IPP license (~ 3)**
 - NERSA - Independent System & Market Operator
- **PPA (~ 3)**
 - ISMO





Potential Partners in SA

- Municipalities (REPAs: RE Purchasing Agencies)
- Industrial Development Zones (IDZs): Coega & EL IDZ
- (Possible in Future) RED Regional Energy Distributors
- Private Industry with plans for investment or expansion plans (in cooperation w. REPAs)





SAWEP



- 2008 - 2010
- by Global Environment Facility
- DoE Wind Atlas
- South African Wind Energy Association (SAWEA)
- National Energy Research Institute (SANERI)
- Funding for Darling Wind Farm
- African Wind Energy Association (AfriWEA)

Links:
www.saneri.org.za
www.afriwea.org





DoE Grant

- up to 20 % of capital cost or R 20 m
- ≥ 1 MW
- R 1 000 / kW
- Subsidised projects
 - Hydro, 8.5 MW
 - Biogas, 4.2 MW
 - Wind, 5.2 MW
 - Landfill, 6 MW
 - Biomass, 8 MW





TRECs & REMT

- SANTREC by Q1 2010
- Green label
- Supply requirement
- Export

- by World Bank, DBSA, GEF
 - www.dbsa.org/projects/pages/default.aspx
- Matching and performance grants





Incentives

- Enterprise Investment Programme
 - up to 30 % of investment into manufacturing projects
 - www.thedti.gov.za/teo/eip.htm
- Support Programme for Industrial Innovation
 - 50 % of development costs
 - www.spii.co.za
- Critical Infrastructure Programme
 - up to 30 % of infrastructure development cost
 - www.dti.gov.za/offerings/offering.asp?offeringid=132





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Danke für Ihr Interesse

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