

# **TERNA Dialogue – Wind Energy in Africa’**

GTZ-Haus Berlin, October 19, 2006

## **Status of Wind Energy in South Africa**

Hermann Oelsner  
**African Wind Energy Association**

# Darling WF First Phase 5,2 MW

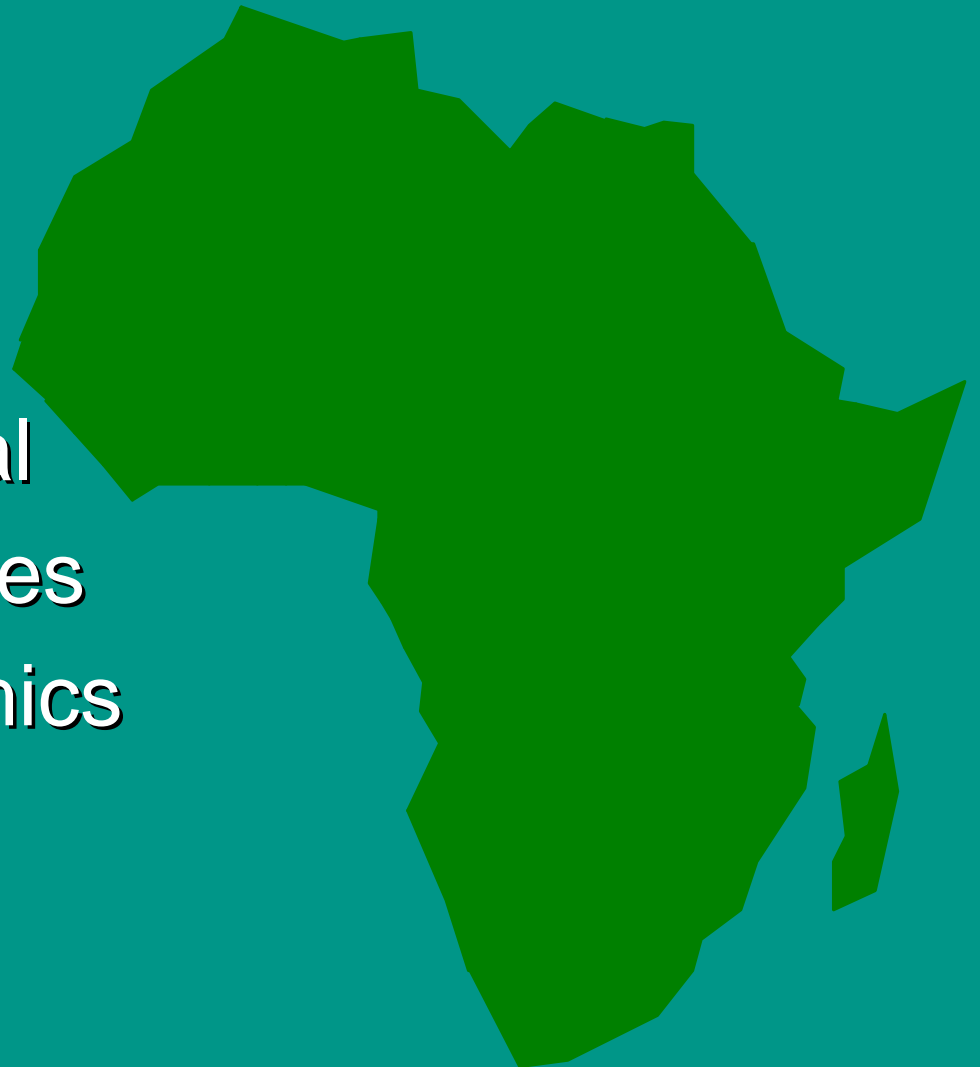


# Growth in Wind Power Capacity



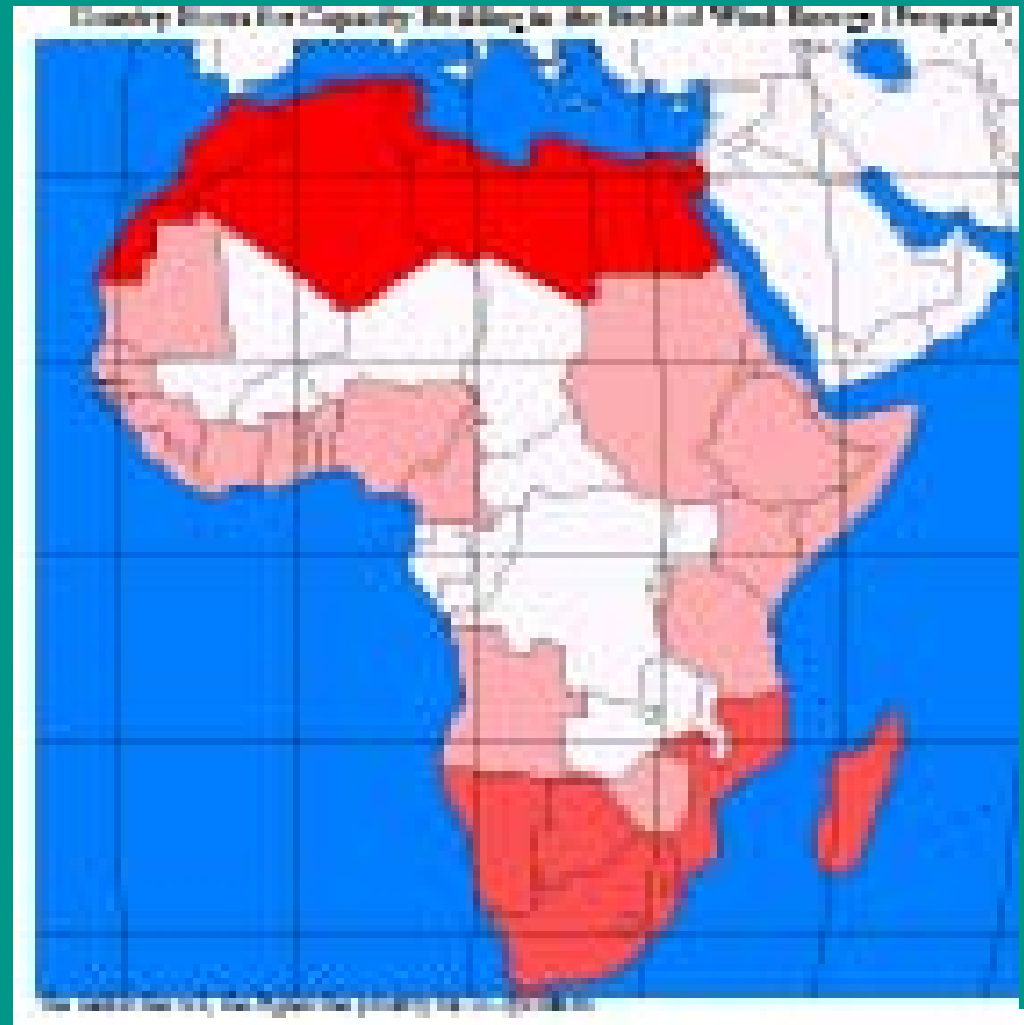
# Wind Energy Potential in Africa

- wind resource
- market potential
- political initiatives
- current economics



# Wind Regimes of Africa

- *UNEP GEF  
Solar and Wind  
Resource  
Assessment  
SWERA*



# SADC PRE-FEASIBILITY

## SWERA

*RSA*

*Namibia*

*Mozambique*

*Botswana*

*Lesotho*

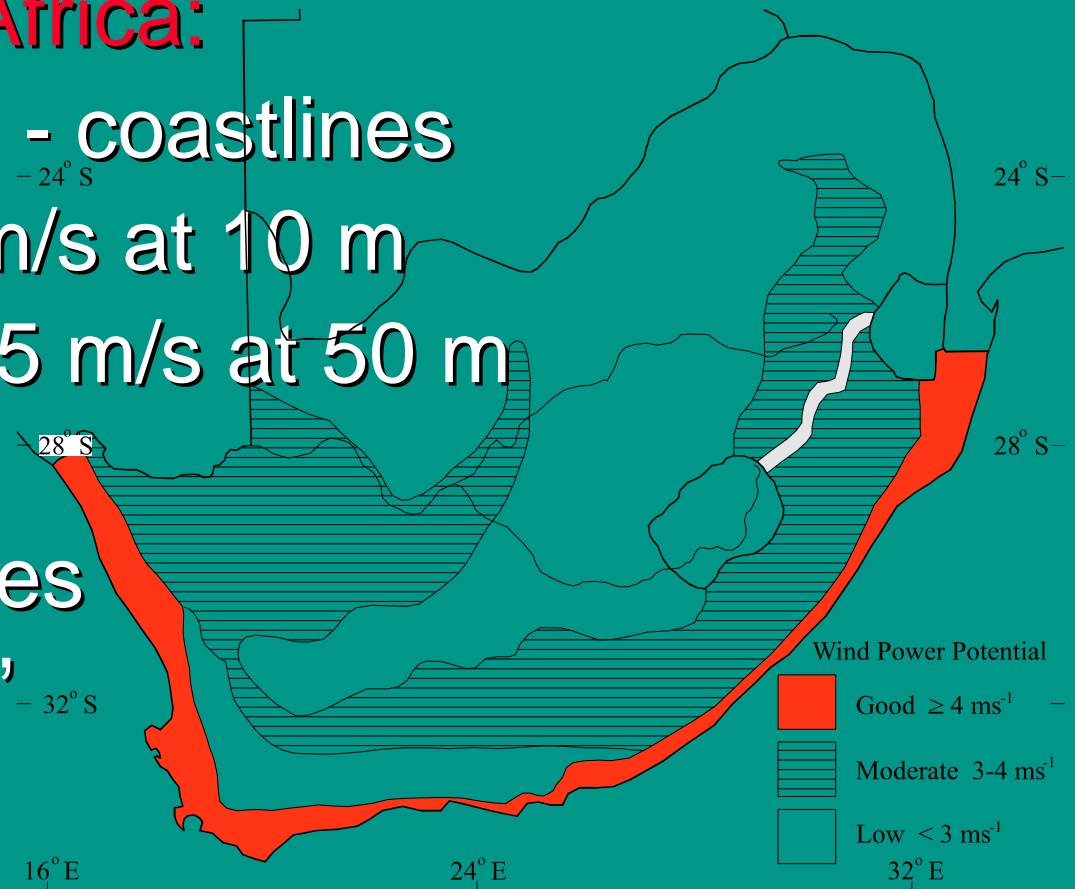
*Madagascar*



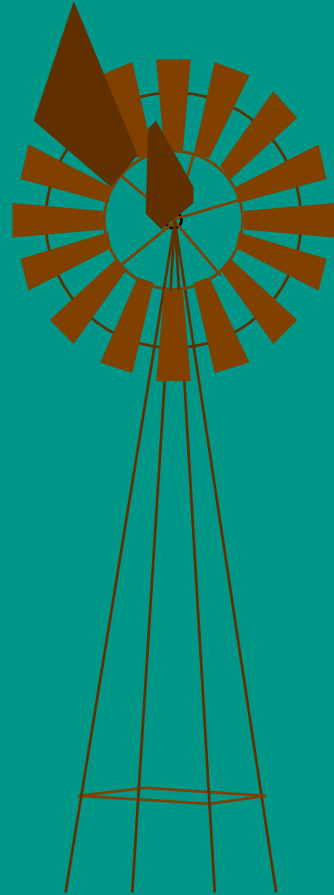
# Wind Resource Assessment

## Example South Africa:

- Abundant wind - coastlines
- Wind Atlas: 4 m/s at 10 m
- West Coast: 8,5 m/s at 50 m
- Karoo
- 200 place names
- 39 “windhoeks”



# African Wind Energy Off-Grid



## Rural Population

- China 80.4 %
- India 77 %
- Rest of Asia 75 %
- **Sub-Sahara Africa 75 %**
- Burundi 95.7 %
- Rwanda 94.3 %
- Burkina Faso 91.5 %
- Uganda 91.2 %
- Malawi 90.9 %
- Ethiopia 89.5 %
- Tanzania 82.2 %
- Kenia 83.9 %

# Rural Community Wind/Hybrid

- PV Solar Home Systems failure
- Lubisi
- Shell / NER
- Local small WT
- Reconditioned WT
- Desalination



# African Wind Energy On-Grid

- 1000 MW by 2013
- 4000 MW by 2020



# Market Structures

- African Union
- League of Arab States
- New Partnership for African Development
- South African Power Pool
- Interconnected system across borders
- Southern African Development Community
- South Africa 70 % SADC GDP
- Gateway to Southern Africa

# Drivers to use Wind in Africa

- Inflation
- Interest Rates
- Trade balance
- Exchange Rate
- Foreign Investment
- Need for job creation
- Security of Supply
- Export + Carbon Credit trading

# Strategic Benefits

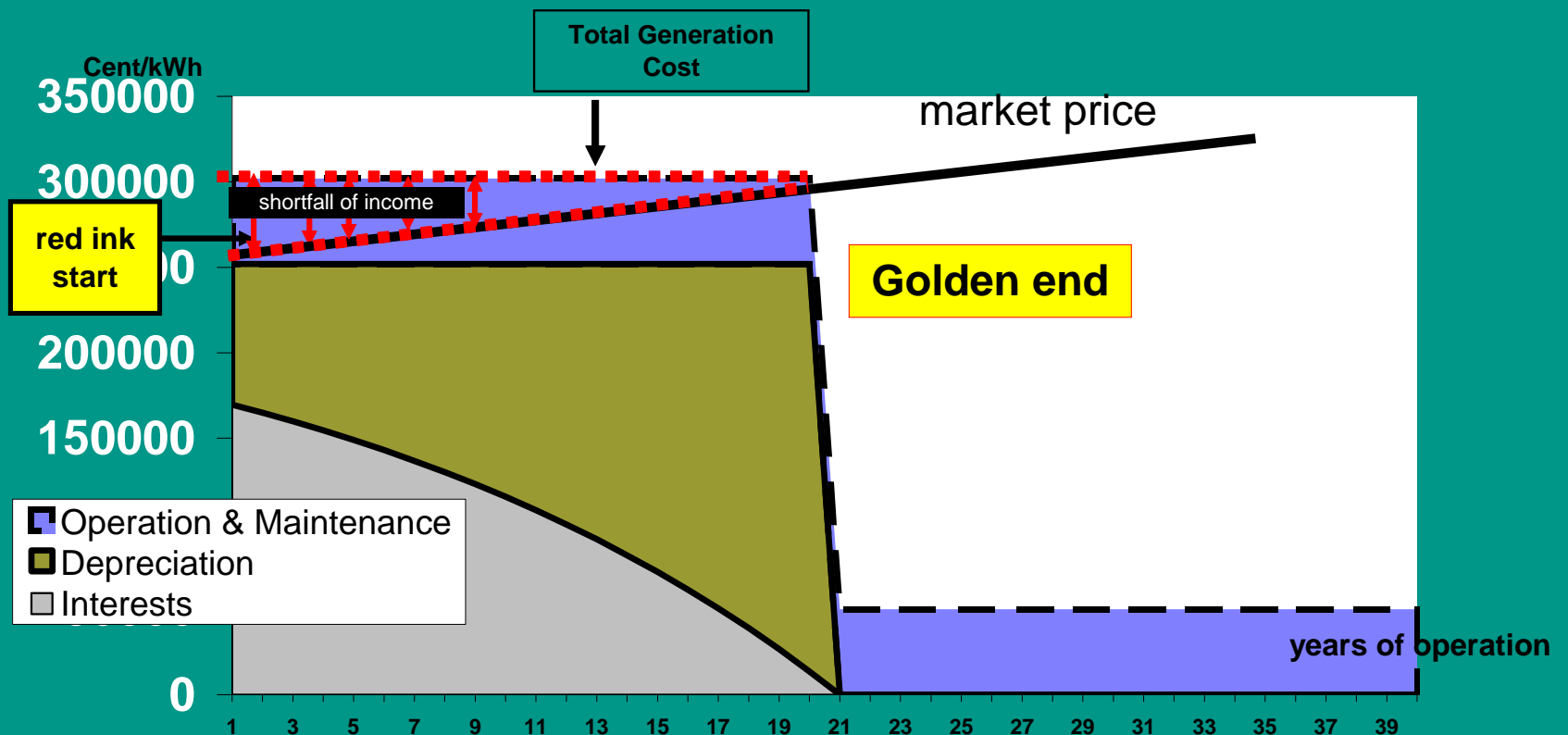
- Prevent Power Cuts in Central System Faults
- Earth Quakes / Natural Disasters
- Less likely Target of War and Terror
- Short Lead Times to ease Western Cape crises
- Decreasing Cost in long term (0 fuel cost)
- Geopolitics: Security of Supply: **RISK!**



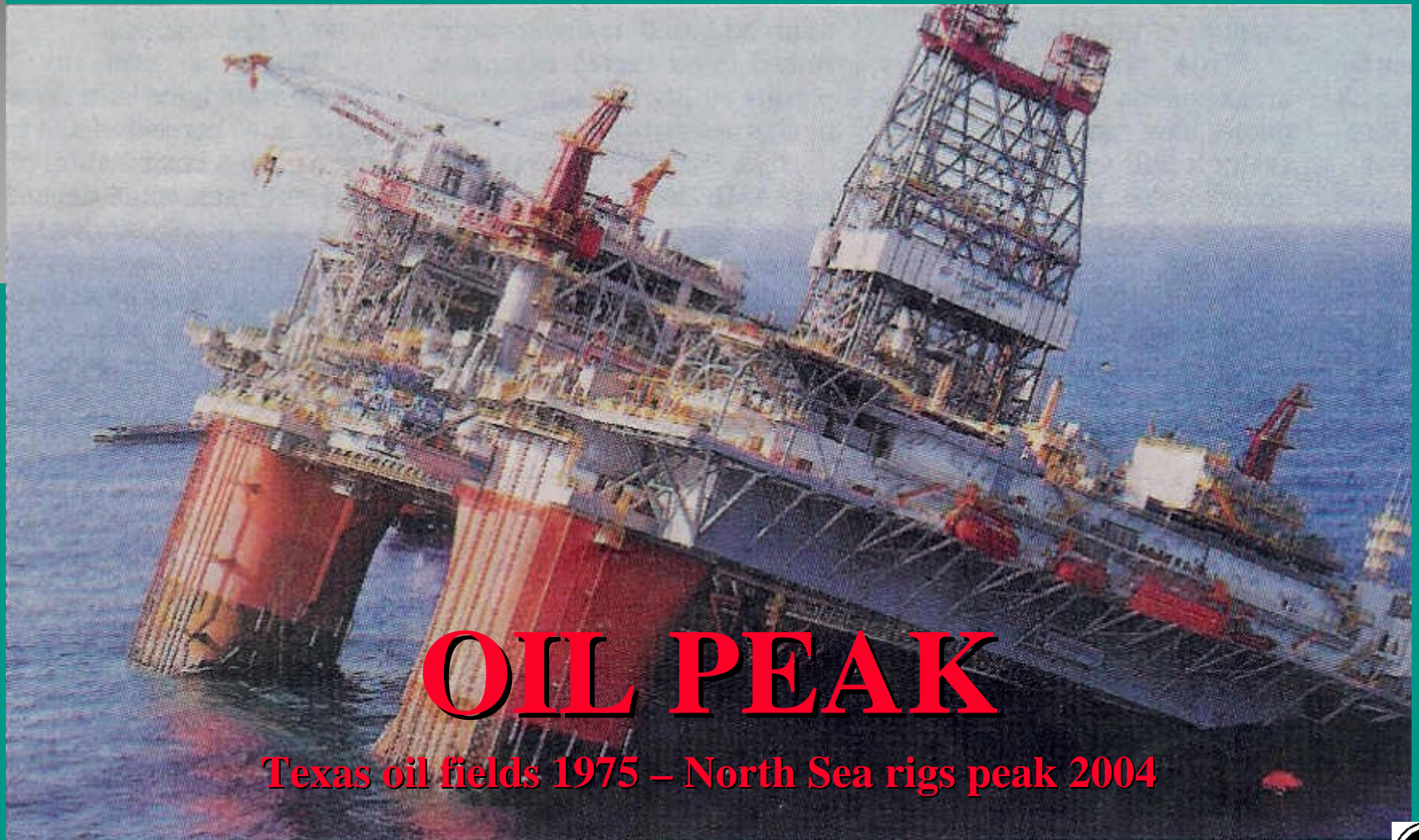
# Finance Structure

## Cost- and pay-back-structure of renewables

High initial capital cost, low fuel, O&M-costs  
bring initial income shortfall and golden end



# Crude Oil Supply



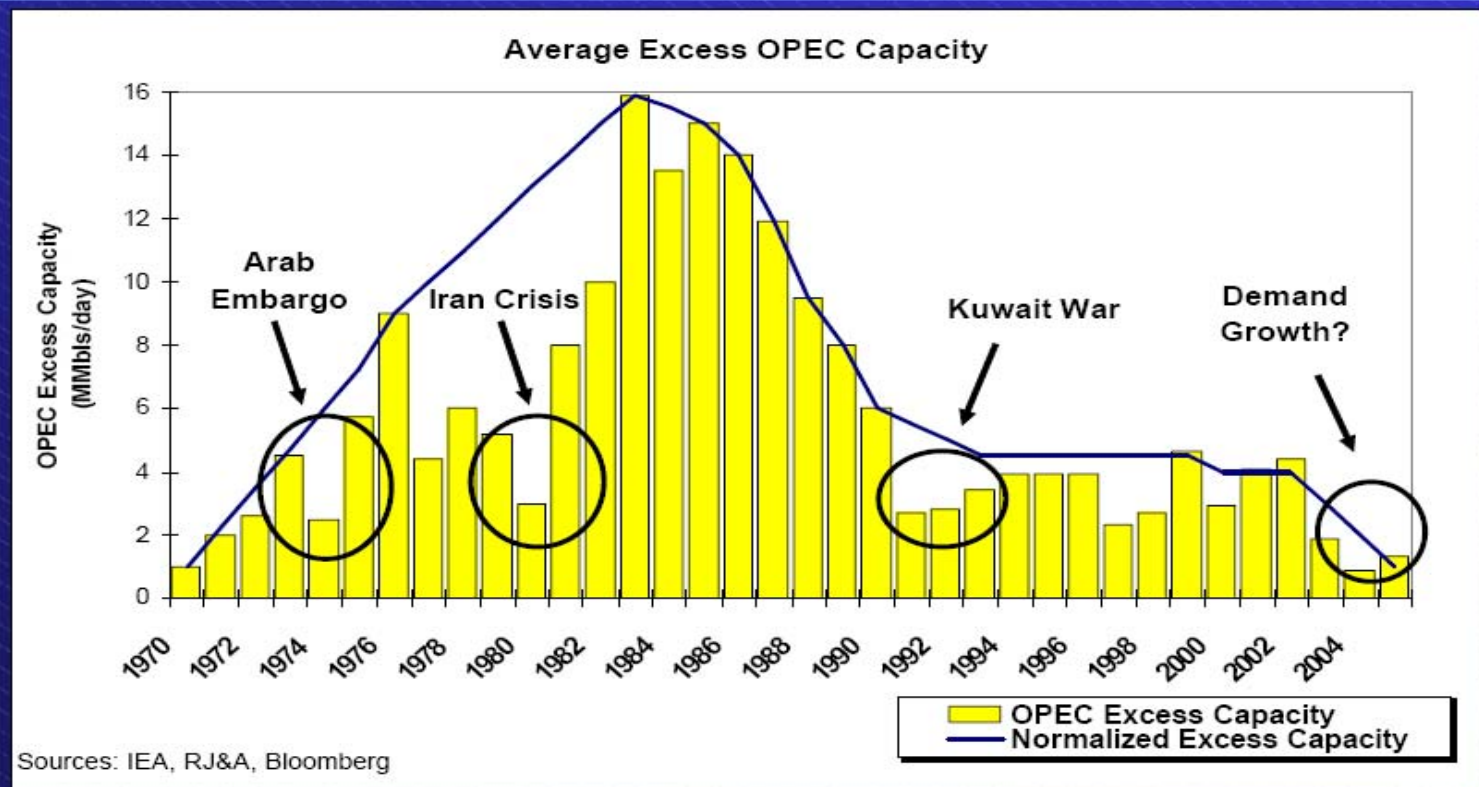
## OIL PEAK

Texas oil fields 1975 – North Sea rigs peak 2004



# Opec Spare Capacity 1970-2005

## The Oil Bubble is Gone!



# Natural Gas Supply



**GAS CLIFF**  
Price Increase

# Coal Supply

**“Cheap Coal”**

**30 YEARS SUPPLY**  
**in SA at today's mode of extraction**



# Nuclear Supply



**INCOMPLETE BUSINESS PLAN**  
needs significant help to cover liability insurance  
Uranium is not an unlimited resource



# Eskom Klipheuvel

- Eskom installed capacity ~ 40 000 MW
- Worldwide wind turbine capacity > 31000 MW 2002
- Eskom national peak demand ~ 31928 MW - 08 July 2003 evening peak
- Klipheuvel = 3.16 MW
- Capacity factor: 13.43 / 13.56 / 8.84 %

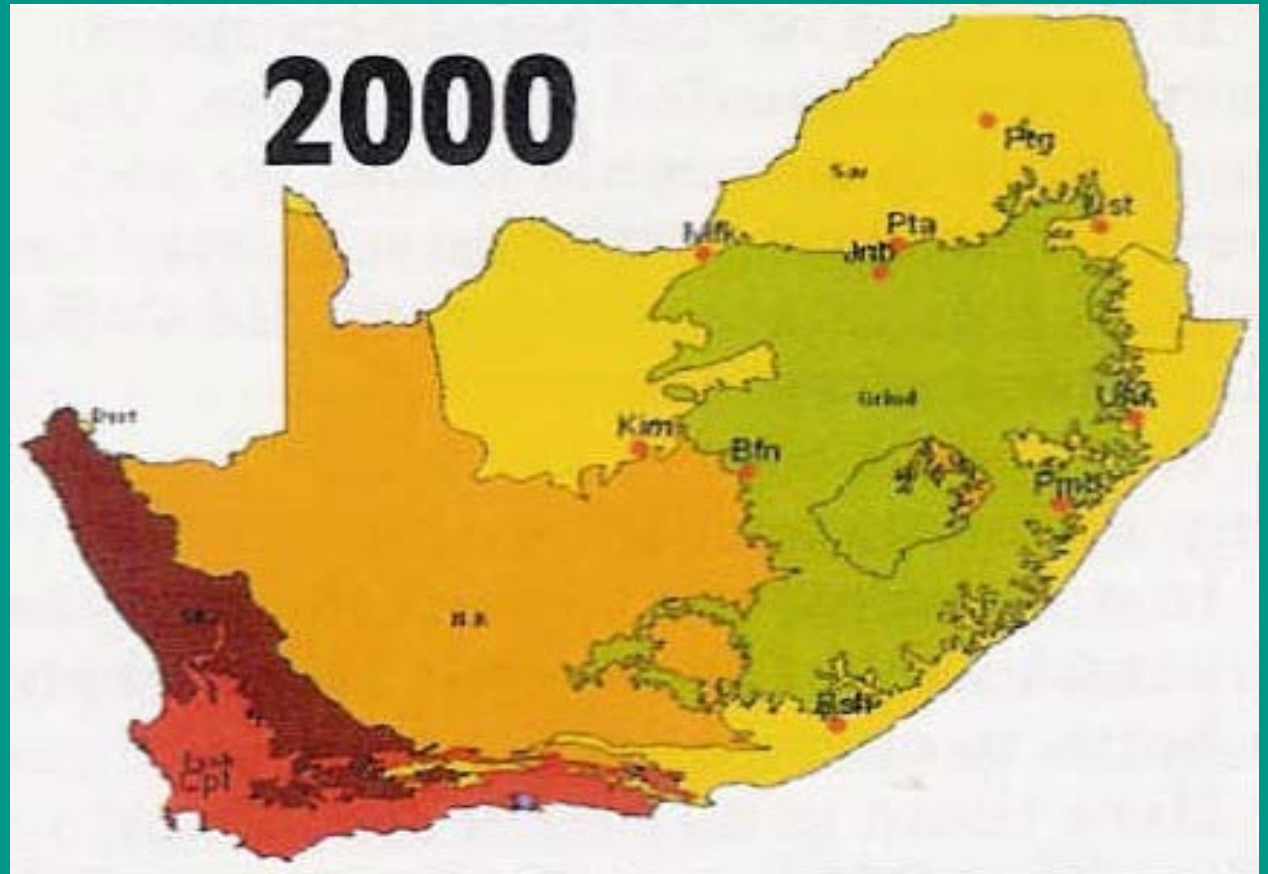


# Opposition to use Wind Energy

- Monopoly of local Utility is loosing business to Independent Power Producers
- Multi Nationals loosing control of energy resources
- Loss of income to Municipalities from end users
- No room for corruption and fraud

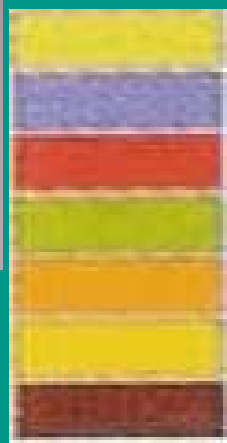


# Effects of global Warming

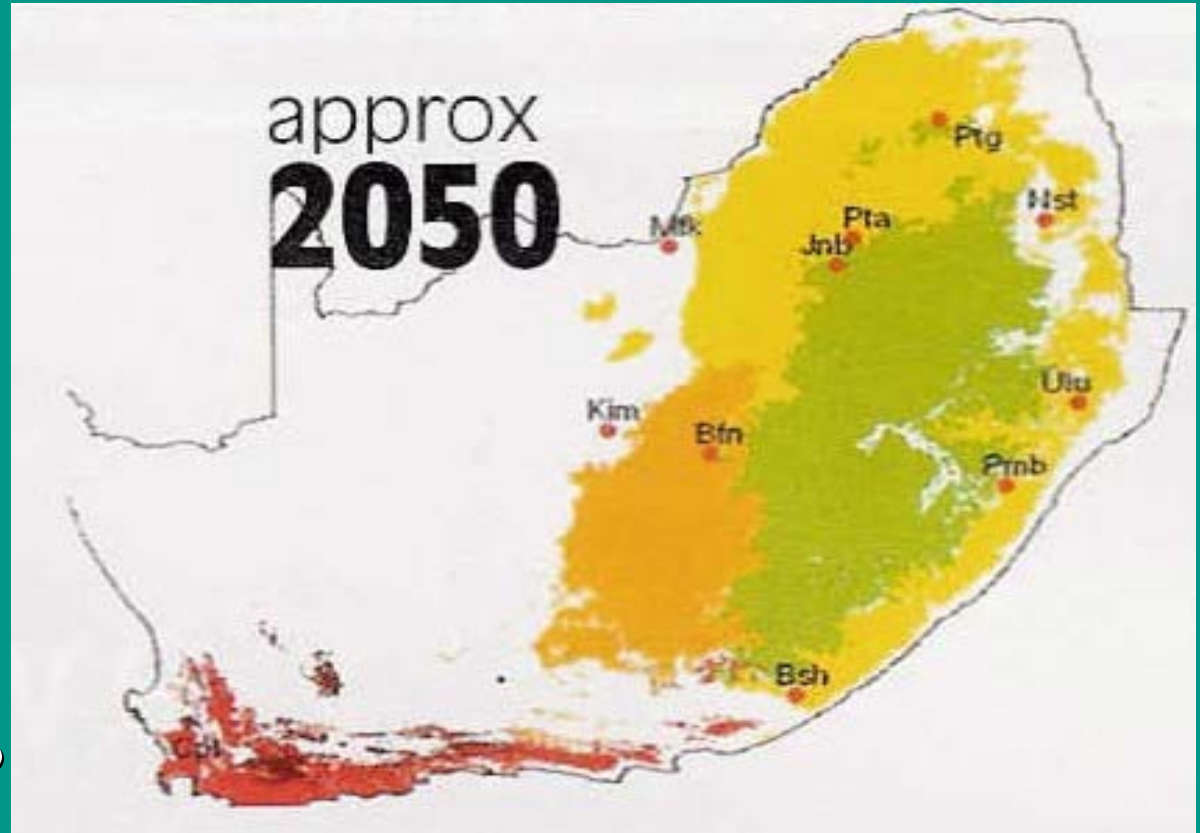


- Desert
- Forest
- Fynbos
- Grassland
- Nama-Karoo
- Savanna
- Succulent Karoo

# Effects of global Warming



Desert  
Forest  
Fynbos  
Grassland  
Nama-Karoo  
Savanna  
Succulent Karoo



**Climatic conditions not presently experienced in the country**

# Conclusion

- Recognise and accept that nobody wants to sell or tax less electricity (wealth) or loose control of the market (power), but it is now happening (EE+DSM):
  - Significant increases in kWh costs are unavoidable
- World-wide, RE projects can only be implemented within a legal framework created by government to account for external costs and to care for the environment and its people



# Recommendation

## ■ Introduce:

- Fair competition in electricity generation to encourage RE IPP
- Feed in tariffs for RE generated electricity
- Taxes on oil and gas, so that local producers can implement biomass, geothermal, solar and wind
- Stop funding for nuclear and fossil research and non-renewable infrastructure
- Net-metering for domestic applications
- Mini-grids for rural off-grid applications



**Wind is free, clean and save**

**Thank  
You**

