Carbon Capture and Storage in South Africa

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South African National Energy Development Institute

South African Centre for carboncapture &storage

COP22

Marrkech, November, 2016

WHY - CO2 Emission Mitigation

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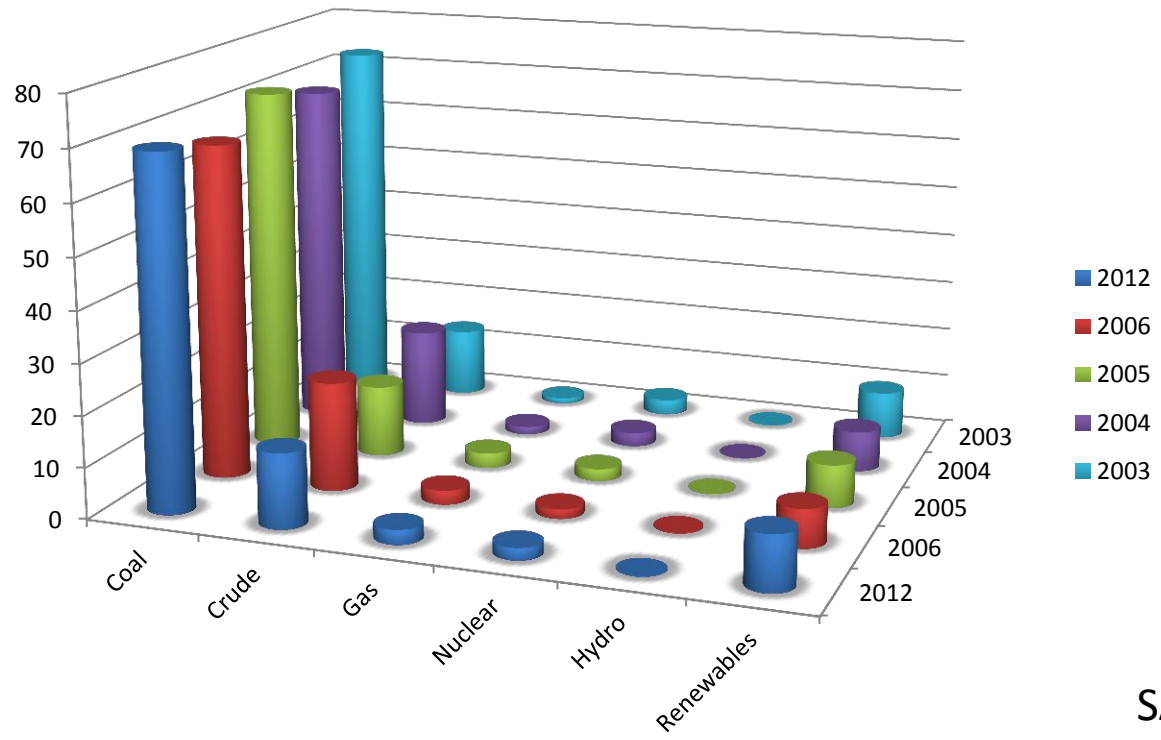

SA reliant on Fossil Fuels

Primary Energy ~90%
Coal ~72%

Digest of Southern African Energy Statistics, 2009, Department of Energy

Only Three Types of Energy
Clean Fossil Fuels as a Transition Technology

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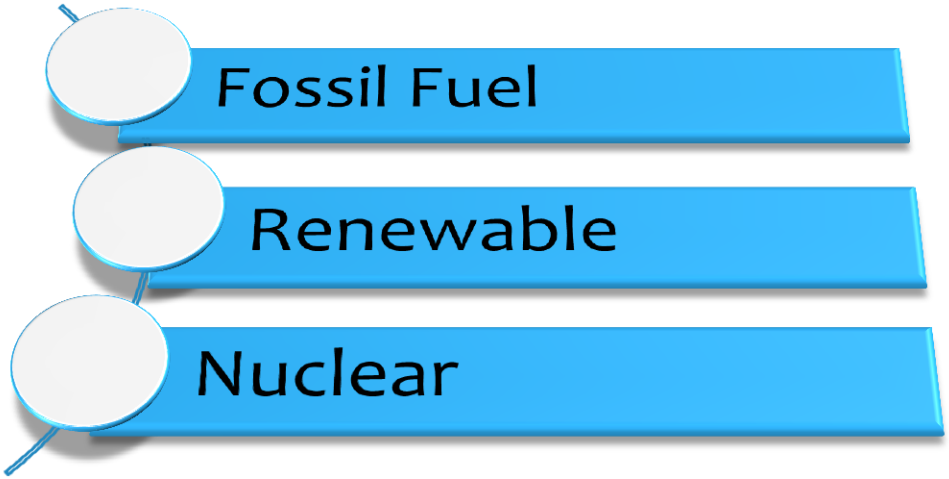

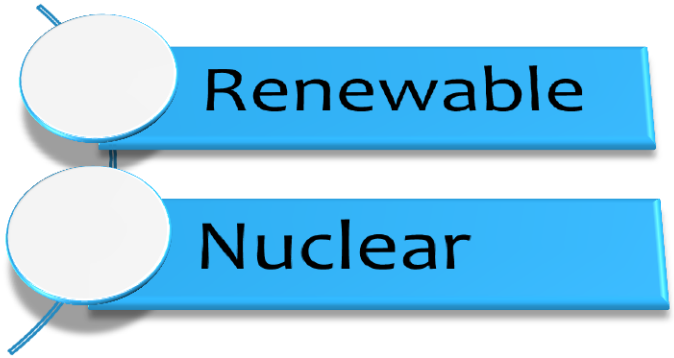

TRANSITION
Clean Fossil Fuels Technologies

Carbon Capture & Storage

Mandate

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- CCS is part of the Long Term Mitigation Scenarios
  Department of Environmental Affairs
- CCS is one of South Africa's eight Near-term Priority Flagship Programmes of the *National Climate Change Response White Paper*, October, 2011
- Cabinet endorsed the South African CCS Road Map during May, 2013
- CCS is included in the National Development Plan 2030

South African CCS Institutional Capacity

- Department of Energy
  Policy and Regulatory Regimes
- Department of Environmental Affairs
  Implementation of the National CC Response White Paper
- Inter-Departmental Task Team for Carbon Capture and Storage
  Inter-Departmental Co-ordination
- South African Centre for Carbon Capture and Storage
  Technical development of CCS in South Africa
- Other Institutions;
  - *University Witwatersrand*
  - *University Johannesburg*
  - *University Pretoria*
  - *University Western Cape*
  - Council for GeoScience – Repository for geological information
  - Petroleum Agency & PetroSA

South African CCS Road Map

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2004: CCS Potential
Done / Yes

2010: Carbon Dioxide Storage Atlas
Launched by Minister Oct2010

2017: Pilot CO2 Storage Project
Current Phase Underway – 10,000's t/yr

2020: Integrated Demonstration Plant
Planned 100,000's tonnes/year

2025: Commercial Operation
Planned millions tonnes/year

Sources of Carbon Dioxide Emissions

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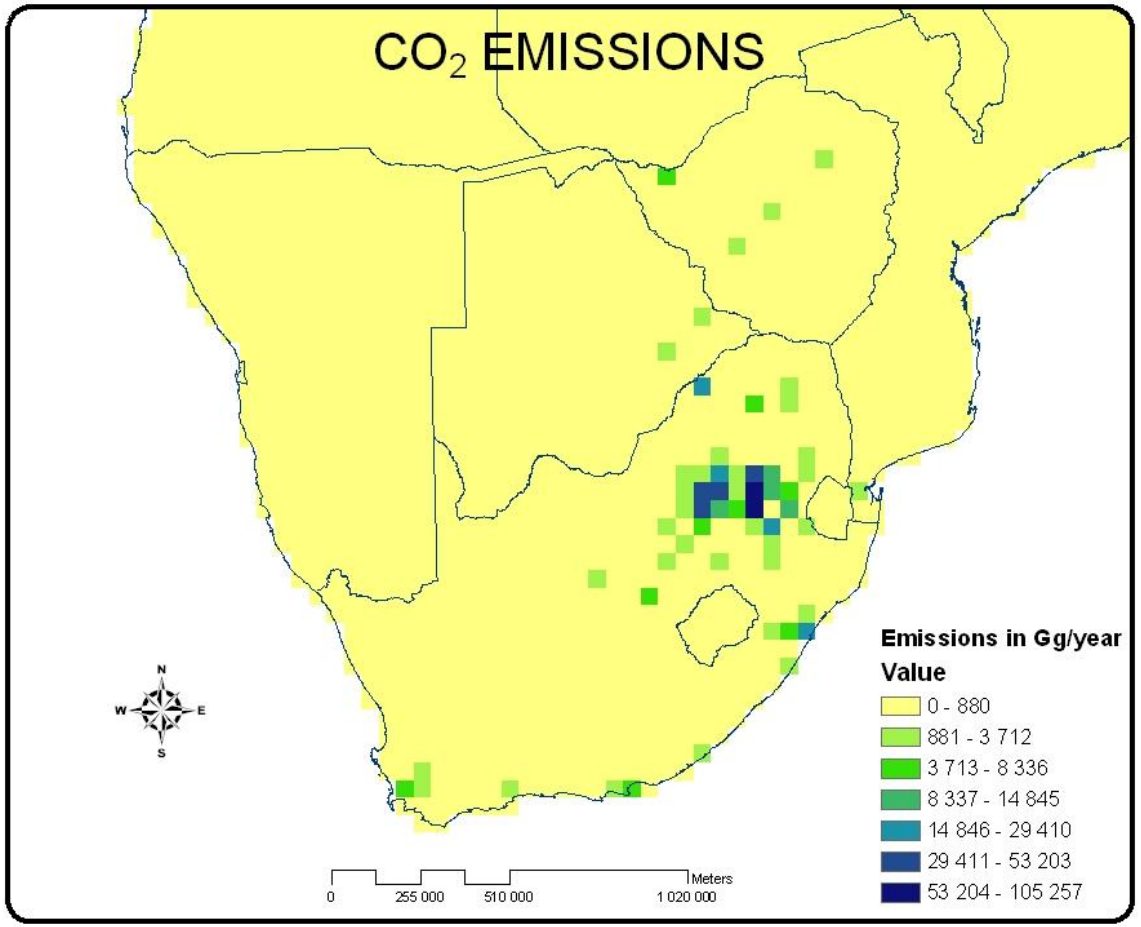


SOURCE: CSIR/DME

Need for a Capture Pilot Plant being accessed.

Hosted by sanedi
South African National Energy Development Institute (SOC) Ltd

Council for Geoscience

ATLAS

on

geological storage of carbon dioxide in South Africa

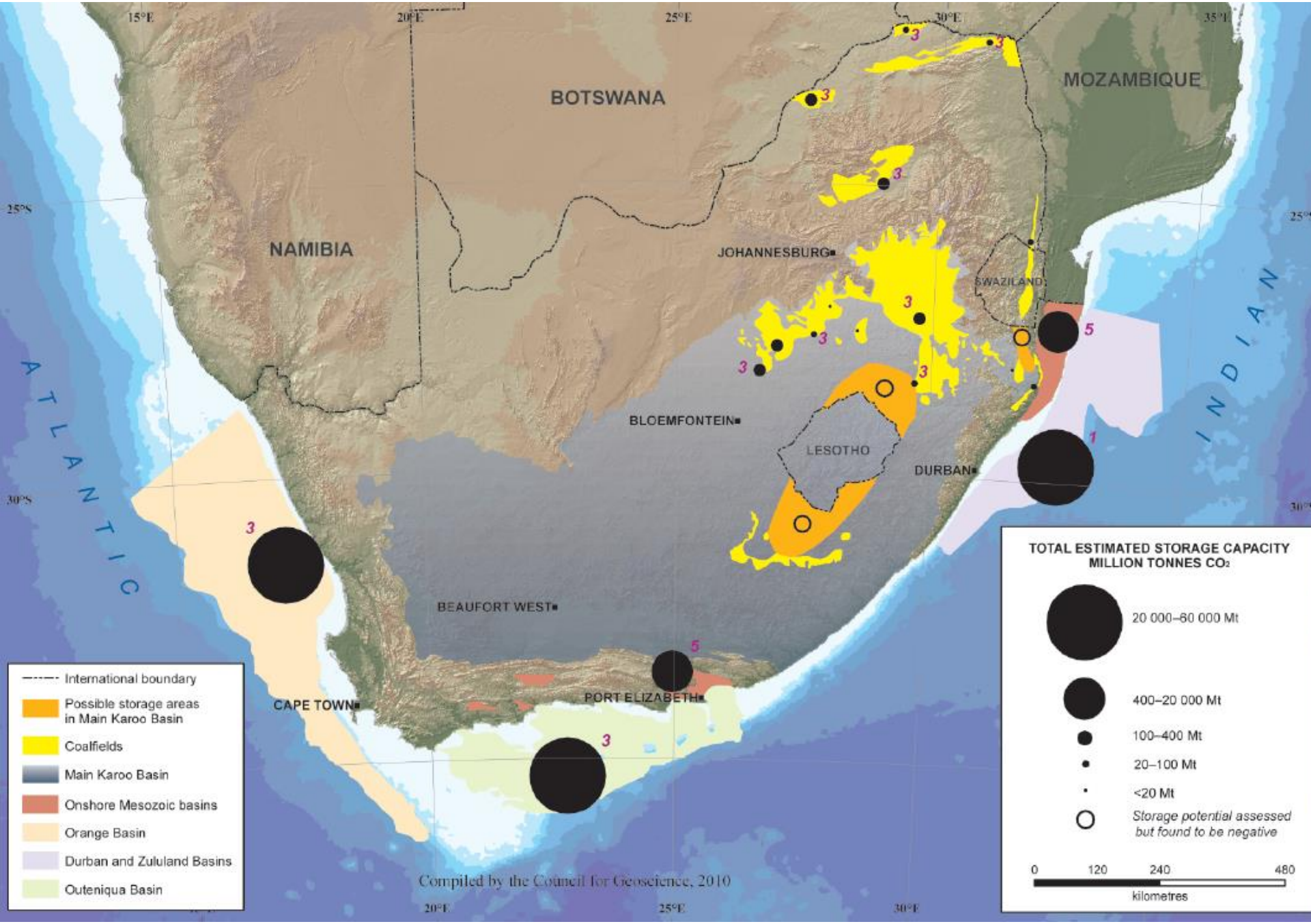
PetroSA

Eskom

sasol
reaching new frontiers

ANGLO AMERICAN

saneri


15°E
20°E
25°E
30°E
35°E
25°S
30°S
BOTSWANA
MOZAMBIQUE
NAMIBIA
JOHANNESBURG
SWAZILAND
BLOEMFONTEIN
LESOTHO
DURBAN
BEAUFORT WEST
CAPE TOWN
PORT ELIZABETH
ATLANTIC
INDIAN
3
5
1
International boundary
Possible storage areas in Main Karoo Basin
Coalfields
Main Karoo Basin
Onshore Mesozoic basins
Orange Basin
Durban and Zululand Basins
Outeniqua Basin
TOTAL ESTIMATED STORAGE CAPACITY
MILLION TONNES CO2
20 000–60 000 Mt
400–20 000 Mt
100–400 Mt
20–100 Mt
<20 Mt
Storage potential assessed but found to be negative
0
120
240
480
kilometres
Compiled by the Council for Geoscience, 2010

Pilot CO_2 Storage Project

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- Demonstrate safe and secure CO_2 storage under South African conditions ["Proof of Concept"]
- Increase the South African human and technical capacity

  dirt under the fingernails
- Raise awareness of the potential importance of CCS
- Platform for government to develop a South African CCS legal and regulatory environment

FOCUS ON ZULULAND ON-SHORE BASIN

- Lower cost
- Accessibility

Stakeholder Engagement

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- National Government
- Provincial Government
- Local Government
- Environmental NGOs
- Organised Labour
- National House Traditional Leaders *[Parliament]*
- Amakhozi *[Local Chiefs]*

Current Stage Includes I:

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- Regulatory:
  - CCS regulations under development
  - Current regulations sufficient for exploratory phase

- Pilot CO_2 Storage Project:
  - Re-analysing existing data
  - Exploration preparation for 2017
  - Pilot Surface Monitoring Project
  - Stakeholder Engagement & Legacy

Current Stage Includes II:

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- SACCCS CCS Development:
  - Impact of prospective South African C Tax on CCS
  - Continuation of CCS in South Africa Business Case
  - Alternative CCS Sites Investigation [SANEDI & IEAGHG]
  - Utilisation of CO_2 [in conjunction with Fossil/ Renewables Hybrids]
  - Bursary Programme
  - Schools Programme
  - International Co-operation
  - Pilot CO_2 Capture Plant Project

THANK YOU

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