

Carbon storage initiatives in South Africa

Brendan Beck

SACCCS Manager & PCSP Lead



The 2nd South African Exploration Drilling Forum

Glen Hove Conferencing, Johannesburg – 24 July 2014



South African Centre for carbon capture & storage

Core Parties



energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA

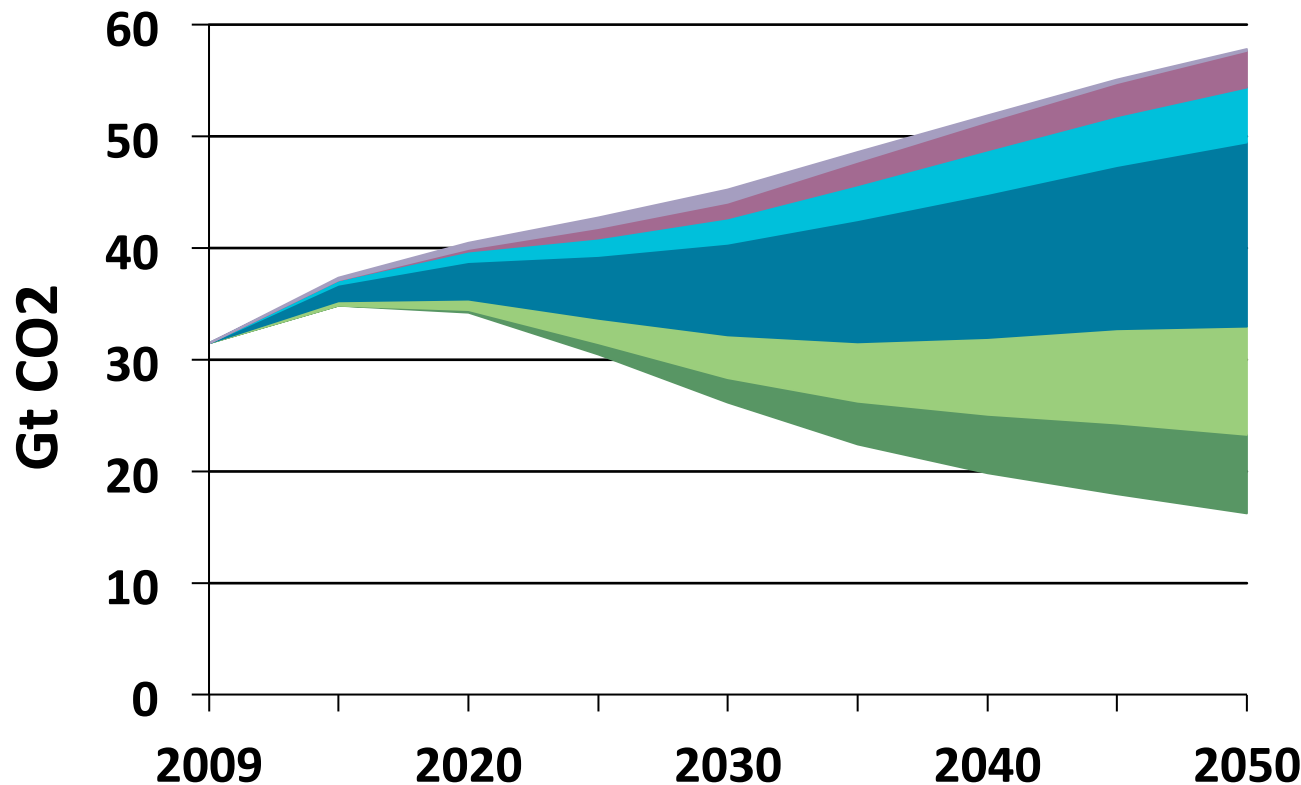
Participants



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The challenge of climate change



- Power generation efficiency and fuel switching 3% (1%)
- Nuclear 8% (8%)
- End-use fuel switching 12% (12%)
- End-use fuel and electricity efficiency 42% (39%)
- Renewables 21% (23%)
- CCS 14% (17%)

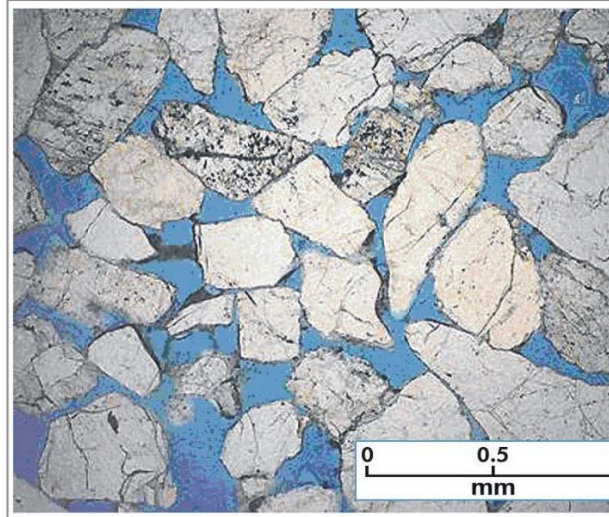
Capture



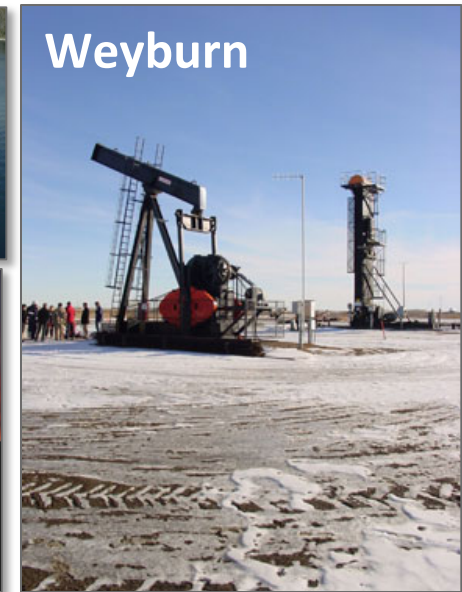
Transport

Storage

Monitoring



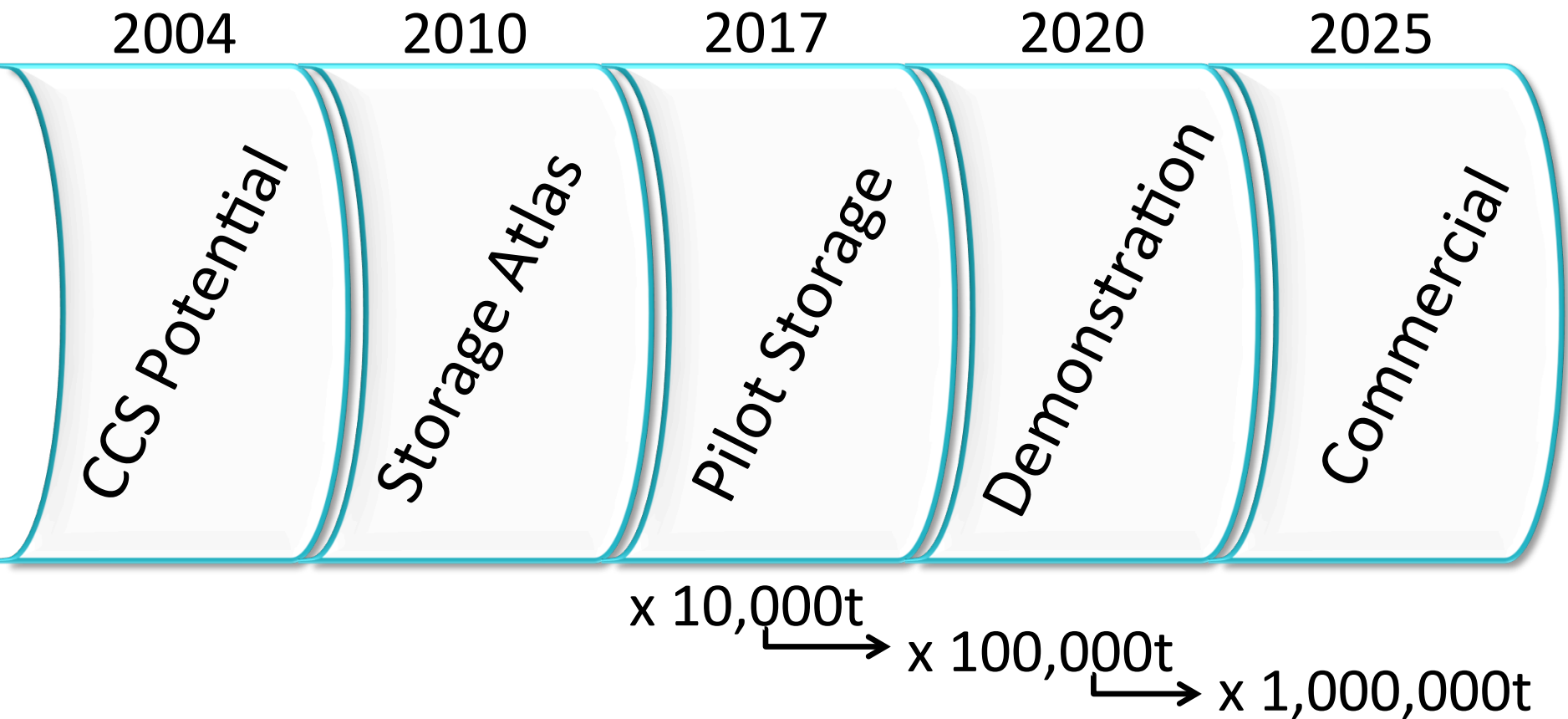
Large scale integrated CCS projects

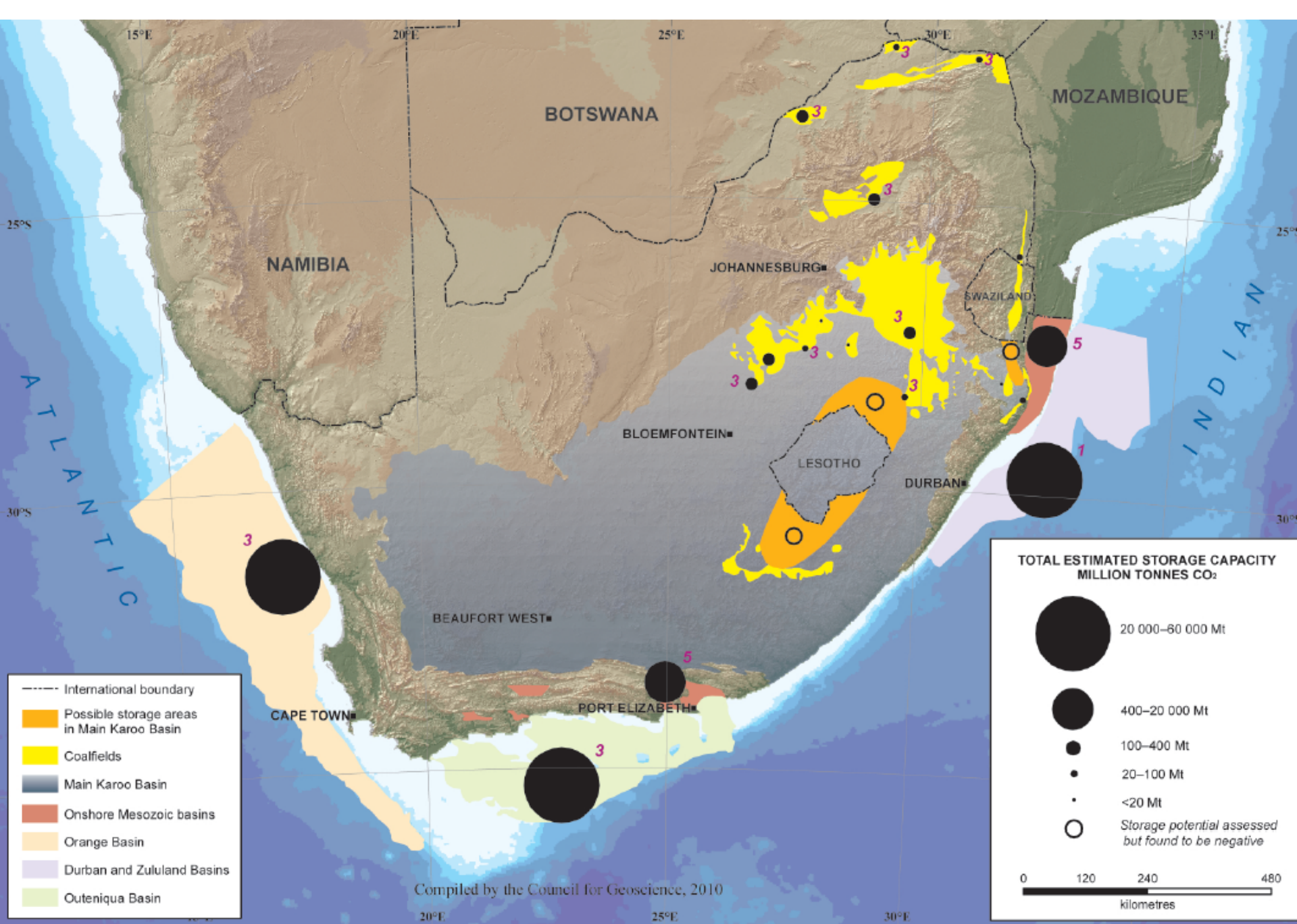


- 5 projects have each stored over 5MtCO₂ each
- 30+ smaller scale test injections

Images courtesy of Statoil, BP, Chevron and PTRC

South African CCS Roadmap





Pilot CO₂ Storage Project



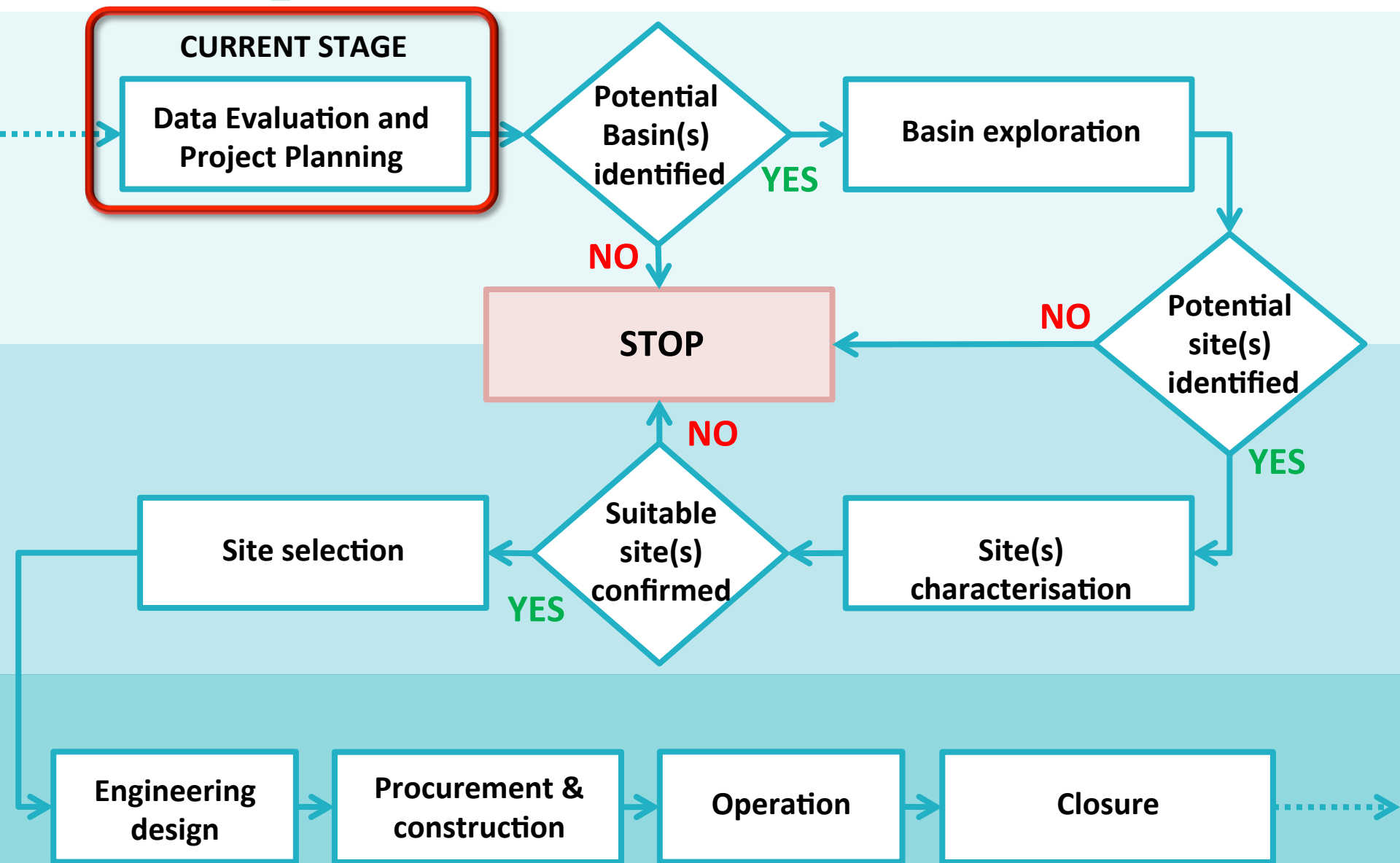
- Demonstrate safe and secure CO₂ storage in South African conditions
- Increase the South African human and technical capacity
- Raise awareness of the potential importance of CCS
- Work with government to develop a South African CCS legal and regulatory environment

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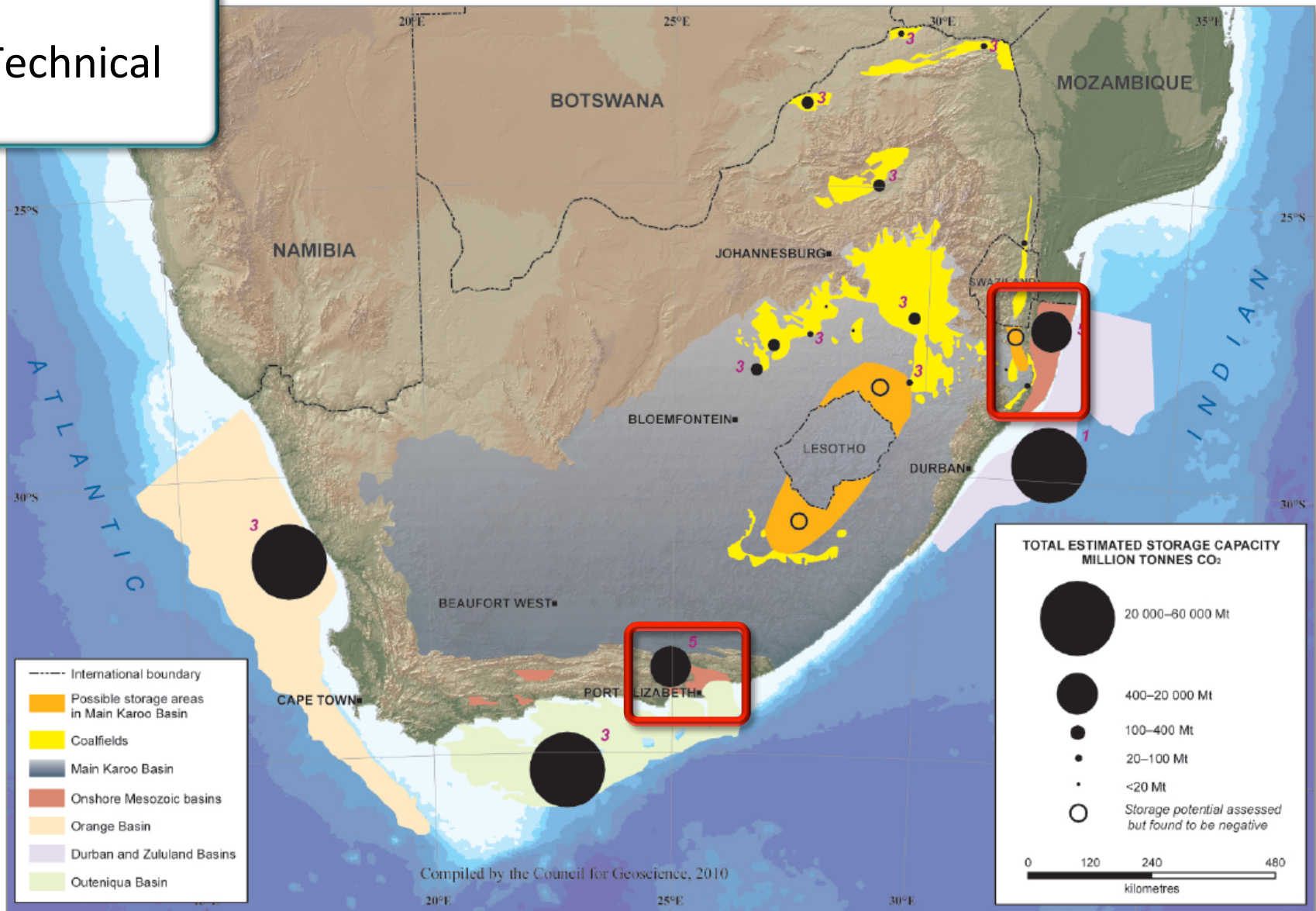




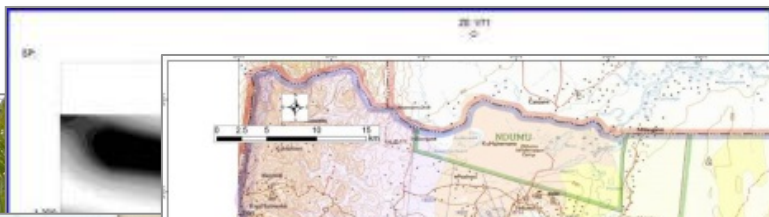
Pilot CO₂ Storage Project flow chart



Technical



Technical



Lebombo Gp	Shale
	Shale
	Rhyolite

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sonedi
South African National Energy
Development Institute (Snedi) Ltd.



sanedi
South African National Energy
Development Institute (SNC) Ltd.

Technical



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Technical

Management

Financial



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Management

Financial

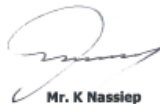
Permitting

On the basis of the background in the necessary permission to undertake the necessary permission to undertake by Dr. Greg Botha from the CGS Minister might require for the geological assessment.

In terms of the proposed Environmental Impact Assessment, the contractors to ensure that any impacts are minimized.

If any further information or clarification is required, please contact the Project Lead for this basin assessment (Mobile: 071 828 6843).

Yours Sincerely,



Mr. K Nassiep
SANEDI Chief Executive Officer

additional lithological data required. The assessment and subsequently to determine the location of suitable areas for the proposed project.

Ministerial discretionary powers under the Mineral Resources Act (Act No. 48 of 2002) (MPRDA) Section 50(1) all to be conducted to ascertain the nature and extent of the Mineral Resources, both in Pretoria and deep well drilling programme will be required to request such a permission for the proposed project.

The area of interest for this investigation is the area of the Municipality (DC 27) and the proposed project covering the area of interest.

Tembe North 17497
Reserve No 14 15834
Zamazama 16924
Pongola West 16637
Grant 16945
Makhatalini Flats 16533
Reserve No 14 7638
Eggelala 14918
Neser 14919
Staalberg 14920
Urk 14573

In preparing this application letter, out if there are any existing or proposed projects in the area, request for permission. For this area, the request for permission is for the permits or rights.

It is expected that the Ministerial assessment will be given the scope of the activities, it is appropriate. The limited impact of the proposed project on the surrounding areas might not trigger any listed activities.



ENERGY INNOVATION FOR LIFE

Tel: 010 201 4800 • SANEDI, PO Box 9935, Sandton, 2146
• Block E, Upper Greyson Office Park, 152 Ann Crescent, Strathaven, 2195

www.sanedi.org.za

Reference: Geological Research
Enquiries: Mr. K Nassiep
Position: SANEDI Chief Executive Officer
Tel: 010 201 4730
E-mail: Kadrin@SANEDI.ORG.ZA
Date: 3 December 2013

Mr. J Raphaela
Deputy Director General
Department of Mineral Resources
Trevenna Campus
70 Meintjies & Schoeman Streets
Sunnyside
Pretoria
0001

Dear Mr. Raphaela

GEOLOGICAL STUDIES TO CONCLUDE BASIN ASSESSMENT RESEARCH FOR CO₂ STORAGE IN THE ZULULAND BASIN

The South African National Energy Development Institute (SANEDI), a Schedule 3A state owned entity established in terms of Section 7 of the National Energy Act, 2008 (Act no. 34 of 2008), published in 2009 the "Atlas on Geological Storage of Carbon Dioxide in South Africa" (Cloete, 2010) which was compiled by the Council for Geoscience (CGS). In line with the findings of the Atlas, the South African Centre for Carbon Capture and Storage (SACCSS) (a division of SANEDI) undertook a follow up study on the Mesozoic, Zululand Basin in KwaZulu-Natal. That research project; "Toward an effective CO₂ storage capacity assessment of the Zululand Basin, South Africa" (Viljoen et al., 2011), also undertaken by the CGS, found that insufficient geological data exist to complete a 'full effective storage capacity assessment' of this basin according to international criteria, e.g. CO₂CRC, 2008 and CSLF, 2008. The current data available and therefore work to date has been based largely on the seismic profiling of the sedimentary basins and borehole logs produced during oil and gas exploration carried-out during the 1960's and 1970's which provide the only deep lithological data and reservoir potential studies available for this basin.

Considerable improvements have been made in geophysical seismic profiling techniques and deep drilling technology that facilitates 'down-the-hole' testing of lithological characteristics that are essential to the evaluation of the CO₂ storage potential of specific lithologies within the basin. Digital seismic profile data from transects across the basin using the latest technology are required to optimize the siting of at least two deep boreholes that will provide the

SANEDI is a State owned Entity, established under the National Energy Act (Act 34 of 2008). Directors: Justice Ndlovu, Mzwanezi Mkhabela, Mr. K. Nassiep, Mr. J. Marriot, Mr. M. Gordon, Mr. M. Mkhabela, Mr. T. Ramatsoela, Dr. D. Hloahloah, Prof. E. Meyer, Mr. M. Vana, Mr. D. Ramatsoela.

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Technical

Management

Financial

Permitting

Stakeholder
engagement

- Engagement underway with National, Provincial, District and Local Governments
- Engagement underway with ENGOs and national stakeholders
- Soon to commence with traditional authorities
- Soon to commence with local stakeholders and public

Technical

Management

Financial

Permitting

Stakeholder
engagement

Capacity
building



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South African Centre for
carbon capture
& storage

Next twelve months

- Appointment of a Project Design and Management Services consultant
- Finalise analysis of existing data
- Development of a plan for Basin Exploration
- Commence specialist studies to review environmental and social impacts of Basin Exploration
- Continue engagement with national, provincial, local authorities including around permitting of Basin Exploration
- Commence engagement with traditional authorities, local stakeholders and the public

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Core Parties



energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

Participants



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