

SOUTH AFRICAN CENTRE FOR CARBON CAPTURE AND STORAGE

Call for Bursary Applications

The South African Centre for Carbon Capture and Storage¹ (SACCCS) hereby invites applications for bursaries from interested South African researchers.

SACCCS was established in 2009 and is responsible for all technical and capacity building on carbon capture and storage (CCS) activities in the country. SACCCS is looking to undertake a Pilot CO₂ Storage Project (PCSP) commencing by 2017. The bursary will cover study costs for Honours, Masters and Doctoral research-based studies in the field of CCS.

SACCCS aims to transform the energy research and development (R&D) human capital available to the country, not only by growing it, but by ensuring that women and previously disadvantaged individuals (PDI) receive sufficient support.

The selection will be done by SACCCS, who reserve the right not to accept any application. Please note that SACCCS's bursaries are awarded subject to the *SACCCS Bursary Terms and Conditions*, which are hereby attached as an Annexure.

The application form can be found below. Please submit your application with any other supporting material by post or email to the address below.

Attention:

Ms Evelyn Nyandoro and Mr Thabo Mosia
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¹ A Division of the South African National Energy Development Institute (SOC).

1. Bursary Application Form

Personal details		
Surname		
First Names		
Race Group		
Gender		
Date of Birth		
Place of Birth		
Identification Number		
Nationality		
Contact Details		
Residential Address		
Postal Address		
Home Tel. Number	Cell	University Tel. Number
Email Address		
Academic Qualifications		
(Please attach a copy of your academic record)		

Supervisor's Comments on applicant's academic record

University

Degree/Diploma

Year completed

Relevant Modules Completed

Describe your interest in Carbon Capture and Storage

Area of further studies

“Please read the background carefully before choosing or suggesting a research topic.”

Background to Research Topics

The South African Centre for Carbon Capture and Storage (SACCCS) was established in 2009 with a mandate to carry out Carbon Capture and Storage (CCS) activities in South Africa. The Centre is expecting to build a Pilot CO₂ Storage Project (PCSP) in 2017 to investigate the feasibility of carbon dioxide (CO₂) Storage in South Africa. Selected topics for this financial year aimed at improving the body of knowledge in different fields of CCS, developing skills that are limited or not present in South Africa and to create skills that could be employed by SACCCS/PCSP after completion. The following background is aimed at assisting the process of topic selection as well as provide the expectations for each topic.

Monitoring

In the border region between KwaZulu Natal and Eastern Cape Provinces there is a fault line, which is approximately 80 km long. Along this fault line, natural CO₂ springs have been identified in three sites.

SACCCS requires skills in surface monitoring, including monitoring CO₂ emissions as part of the PCSP. The organisation has identified the natural CO₂ emissions at Bongwana, one of the sites along the said fault line, as an ideal site to develop monitoring techniques of CO₂ emissions. Important aspects of the project will be to acquire and use the appropriate monitoring equipment to characterise and quantify the CO₂ emissions. The project could entail a study tour to an overseas facility to get acquainted with monitoring equipment, protocol evaluation of results. The learning from the study tour need to be applied at and adapted to the Bongwana site. It is expected that scientific publications will be an important output of the project.

Social

It has been understood, for about a decade, that South Africa has potential to implement CCS as part of a portfolio of CO₂ mitigation technologies to help address CO₂ emissions from large point sources such as power plants and industrial facilities.

For CCS to be fully considered as part of South Africa’s energy strategy, and climate change mitigation actions, stakeholders must be engaged and provided with information about the basic principles

around the CCS technology as well as benefits and potential risks of its application. This information must be given at a national and local level and address the following objectives:

- Raise awareness of CCS as a possible climate change mitigation measure;
- Develop understanding of CCS, key concepts, subsurface storage and key issues;
- Outline the benefits and potential risks of demonstration and deployment of the CCS technology in South Africa; and
- Place CCS in the context of South African climate change mitigation, energy production and use, coal use, resource development, job creation, amongst others.

Significant achievements were made on the PCSP Stakeholder Engagement since 2013/14 financial year.

The Nat-Loc Plans commissioned and funded by the World Bank Group (WBG) and endorsed by the Department of Energy (DoE) recommended that PCSP stakeholders should be engaged in the following order:

- National government;
- Provincial government;
- District Municipalities;
- Local Municipalities; and
- Local stakeholders.

This order was proposed to ensure the most important stakeholders are informed about the PCSP by SACCCS (which is an organisation assigned to implement and monitor CCS in South Africa) rather than hearing about it through less informed sources.

Moreover, history can attest that poor/lack of stakeholder engagement is major factor towards the demise of many projects worldwide. It is therefore evident that the public engagement will be an important part of the PCSP throughout the project life cycle.

Environmental

The PCSP is a project that SACCCS will implement in order to determine whether CO₂ can indeed be stored and contained in South African geology. The PCSP is a proof of concept for CCS in South Africa. The effect of CO₂ on the surrounding environment is an important aspect of CO₂ storage and basin monitoring and the topics seek to evaluate the effects of naturally occurring CO₂ on its environment

and the possible effects in an environment like the Zululand Basin, which is one of the basins being considered for storing CO₂.

PLEASE SELECT ONE TOPIC OR SUGGEST A TOPIC OF YOUR CHOICE

Social

Pilot Carbon Storage Project: Assessing the Project Community Consultation Strategies in the Algoa/Zululand Basin.

Communicating Potential Risks of CCS Technology: Awareness, Knowledge, Perception and Information Sources among members of the Zululand/Algoa Basin.

Assessing awareness of and attitudes towards CCS in the Algoa/Zululand basin.

Public Awareness of Carbon Capture and Storage: A Survey of Attitudes toward Climate Change Mitigation.

Monitoring

Analysis of the atmospheric distribution of the CO₂ at the Bongwana site via atmospheric tomography or other techniques with consideration of its application to the Zululand Basin PCSP area of interest.

Analysis of the surface expression of the CO₂ emissions at the Bongwana site via soil gas concentrations, soil gas flux, analysis of satellite imagery or other techniques with consideration of its application to the Zululand Basin PCSP area of interest.

Geology

The effect of on the mineralogy of the Cenomanian and/or Aptian Sandstones when exposed to CO₂ under injection pressures.

Structural Geology of the Zululand Basin - Mapping the faults and related structures (utilizing current aeromag surveys and field mapping) in the Zululand Basin and discuss its impacts for leakage pathways from CO₂ injection.

Simulation of CO₂ storage in aquifer models.

Fault Seals Analysis for CO₂ storage around Pletmos basin onshore South Africa.

Effects of aquifer/Caprock interface on storage of CO₂.

Strategies to enhance long term secured CO₂ storage.

Provide the key questions to be answered in relation to this topic (5-10 questions)

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10.

Describe the methodology you would use for this study (500-1000 words)

Describe your interest in the topic you have chosen (500-1000 words)

Describe your qualifications and experience with relation to this topic (500-1000 words)

Supervisor Name and affiliation	
I hereby certify that the applicant is academically qualified with appropriate grades and has sufficient abilities to undertake the research project.	
Supervisor endorsement	
Supervisor signature	