General CCS & PCSP
Stakeholder Engagement
Annual Report

2015/16
“Every local context will be unique and any community is likely to contain a range of opinions. Effective community engagement should seek to include all relevant stakeholders, not only those that proactively step forward.”

– Sara M. Forbes, World Research Institute
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Stakeholder Engagement Report. 2015/16
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## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AEOs</td>
<td>Assistant Education Officers</td>
</tr>
<tr>
<td>AET</td>
<td>Adult Education and Training</td>
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<tr>
<td>APP</td>
<td>Annual Performance Plan</td>
</tr>
<tr>
<td>BNCR</td>
<td>Bongwana Natural CO₂ Release</td>
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<tr>
<td>BoG</td>
<td>Board of Governors</td>
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<tr>
<td>CCS</td>
<td>Carbon Capture &amp; Storage</td>
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<tr>
<td>CO₂</td>
<td>Carbon Dioxide</td>
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<tr>
<td>CSIR</td>
<td>Council for Scientific and Industrial Research</td>
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<td>DEA</td>
<td>Department of Environmental Affairs</td>
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<td>DoE</td>
<td>Department of Energy</td>
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<td>EC</td>
<td>Eastern Cape</td>
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<td>EDTEA</td>
<td>Department of Economic Development, Tourism and Environmental Affairs</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EXCO</td>
<td>Executive Committee</td>
</tr>
<tr>
<td>GDARD</td>
<td>Gauteng Department of Agriculture and Rural Development</td>
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<td>GHG</td>
<td>Greenhouse Gases</td>
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<tr>
<td>GPDMC</td>
<td>Gauteng Provincial Disaster Management Committee</td>
</tr>
<tr>
<td>ITB</td>
<td>Ingonyama Trust Board</td>
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<tr>
<td>KZN</td>
<td>KwaZulu-Natal</td>
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<tr>
<td>MoU</td>
<td>Memorandum of Understanding</td>
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<td>NatLoc Plans</td>
<td>National and Local Stakeholder Engagement Plans</td>
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<tr>
<td>NHTL</td>
<td>National House of Traditional Leaders</td>
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<td>PCSP</td>
<td>Pilot CO₂ Storage Project</td>
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<tr>
<td>PHTL</td>
<td>Provincial House of Traditional Leaders</td>
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<td>PMP</td>
<td>Pilot CO₂ Capacity Building Monitoring Project</td>
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<td>PSP</td>
<td>Pilot Schools Project</td>
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<td>SACCSCS</td>
<td>South African Centre for Carbon Capture &amp; Storage</td>
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<tr>
<td>SALGA</td>
<td>South African Local Government Association</td>
</tr>
<tr>
<td>SANBI</td>
<td>South African National Biodiversity Institute</td>
</tr>
<tr>
<td>SANEDI</td>
<td>South African National Energy Development Institute</td>
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<tr>
<td>SE</td>
<td>Stakeholder Engagement</td>
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<tr>
<td>SoEs</td>
<td>State-Owned Enterprises</td>
</tr>
<tr>
<td>SRVM</td>
<td>Sundays River Valley Municipality</td>
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<tr>
<td>STEM</td>
<td>Science, Technology, Engineering and Maths</td>
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<tr>
<td>TUT</td>
<td>Tshwane University of Tshwane</td>
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<tr>
<td>UFS</td>
<td>University of Free State</td>
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<tr>
<td>UKDM</td>
<td>Umkhanyakude District Municipality</td>
</tr>
<tr>
<td>UKED</td>
<td>Umkhanyakude Education District</td>
</tr>
<tr>
<td>ULHTL</td>
<td>Ugu Local House of Traditional Leaders</td>
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<td>WRI</td>
<td>World Resource Institute</td>
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</table>
There are only three types of energy available to human kind: fossil fuels, nuclear and renewable. We need to put less reliance on fossil fuels in order to combat global warming and more reliance on nuclear and renewable. We need to move from a fossil fuel and nuclear energy mix to a nuclear and renewable mix but this will take many years.

CCS enables us to reduce emissions from fossil fuels while we make this transition. CCS has the greatest potential to safely store millions upon millions of tonnes of carbon worldwide, and has greater potential than any other technology to reduce emissions. SACCCS studies show that South Africa has a theoretical potential to store 150 giga-tonnes of CO$_2$ and that 98% of the theoretical storage sites are off-shore. As these are difficult and costly to access, The SACCCS is planning its pilot project in one of the two potential on-shore basins.

We have developed a comprehensive communications and information programme. We recognise that CCS is a new technology and that people will have questions and concerns. We want to keep them as well informed as possible, respond to any concerns and avoid misinformation at all costs. We have been engaging, and will continue to engage all parties throughout the storage process. Storage areas lie deeper than 1 kilometre and are capped to prevent leakage of CO$_2$. Storage sites are also subject to mandatory verification and monitoring. Underground sources of potable water are at depths of 50 to 200 metres, and will not be affected by storage.

If the pilot storage project is successful, the next stage will be to build a full demonstration plant. If this proves successful, the way to commercialise CCS will be open. SACCCS in tandem with the Department of Energy (Communications & Hydrocarbons Directorates hosted a successful 4th Biennial CCS conference in October 2015 held in Sandton, South Africa.

In preparation for the PCSP the South African Centre for CCS (SACCCS) has embarked on a Pilot CO$_2$ Monitoring Capacity Building Project (PMP) which aims to use studies of the Bongwana Natural CO2 Release (BNCR) to inform the development of a detailed monitoring plan for the PCSP. After concerted efforts by the Stakeholder Engagement team to garner the support of AmaKhos in Sandton, permission was granted for SACCCS to go ahead with the PMP. However, the AmaKhosi requested to be kept abreast and be furnished with the findings before they are released to the public.

Key to the success of the PCSP is acceptance by the Stakeholders. SACCCS has embarked on an intensive Stakeholder Engagement outreach programme aimed at creating awareness and educate the communities about the Carbon Capture & Storage. Various Stakeholders are being consulted, including the National, Provincial government departments industry, the local municipalities and Environmental NGOs with a focus on the UMkhanyakude District Municipality in KwaZulu-Natal and Cacadu District Municipality in Eastern Cape. Thus far the response from the Stakeholders has been positive at the National, Provincial and Local government levels.

We plan to store a relatively small amount of CO$_2$—say, about 10 000 tonnes per year and we still need to find a CO$_2$ source which we will need to transport by road.
1. Executive Summary

The rapid rise and continued use of fossil fuels have led to two matters of concern, namely the finiteness and the impact on the environment. The Cleaner Fossil Fuels Section of the South African National Energy Development Institute (SANEDI) is directed to the efficient use of a finite resource in an environmentally suitable manner. To this end, and within the resources available, a number of research and development thrusts have been initiated.

Clean coal technologies are an option to minimise environmental impacts, thus fighting against Climate Change. Carbon Capture and Storage (CCS) is the major activity of the Cleaner Fossil Fuels Programmes of SANEDI. CCS is one of the eight national flagship priority programmes in the National Climate Change Response White Paper. SANEDI’s work on CCS is executed through the South African Centre for Carbon Capture & Storage (SACCCS).

CCS encompasses a suite of existing and emerging technologies for capture, transport and storage of carbon dioxide (CO₂) that together can be used to reduce the greenhouse gases (GHG) emissions from fossil fuels power generations and other industrial sources.

Figure 1: The continued use of fossil fuels has led to the significant increase of greenhouse gases into the atmosphere.
Image Source: Eskom

1.1. Purpose of the Report

The purpose of this document is to outline the progress of Stakeholder Engagement activities and highlight the technical work that is being conducted on Pilot CO₂ Storage Project (PCSP) as well as Carbon Capture and Storage. The Stakeholder Engagement (SE) Work Theme presents the key considerations for public and stakeholder engagement regarding the deployment of CCS in South Africa. The Stakeholder Engagement division has recognised the scale and nature of the challenges facing communicating CCS. CCS does not fit neatly into any available template for infrastructure development even though Government structures are likely to perceive success in terms of the objectives of the project, improved energy security and reduced CO₂ emissions.

CCS is not a simple, single technology, but a novel combination of techniques and different industry practices which lack any iconic visual elements such as:

- Capture through Pre-, Post- and oxy- fuel combustion methods,
- Transport,
- Injection, storage and monitoring of CO₂.

Unlike other methods of creating low-carbon energy, CCS struggles to be painted as distinctly kind to the environment.
Carbon Capture & Storage in South Africa

- Freshwater Zone
- Oil and Gas Reservoir
- Deep Saline Formations

5,000 to 12,000 feet
It has been understood that South Africa has the potential to implement CCS as part of the portfolio of climate change mitigation technologies.

CCS plays a critical role in reducing CO$_2$ emissions from large point sources such as industrial facilities and power plants. SACCCS has been mandated by the South African Department of Energy (DoE) to champion the course of CCS in South Africa.

1.2.1. The Status of CCS in South Africa

SACCCS is addressing its mandate in line with the South African CCS Roadmap, the CCS Roadmap milestones are as follows.

- 2004 - Assessment of the potential for CCS in South Africa - (Complete);
- 2010 - Development of a South African CO$_2$ Geological Storage Atlas (Complete);
- 2017 - Commencement of a Pilot CO$_2$ Storage Project (10,000 - 50,000tCO$_2$ stored) - (Underway);
- 2020 - Facilitate the commencement of a CCS demonstration plant (in the order of 100,000tCO$_2$/year)
- 2025 - Inform the implementation of commercial CCS deployment (over 1,000,000tCO$_2$/year).

These milestones are dependent on finding suitable South African geology for CO$_2$ storage, public acceptance as well as receiving ongoing, sufficient financial and technical support from Government, industry and international stakeholders.
The 2010 Atlas on Geological Storage of CO\textsubscript{2} in South Africa identifies five potential on-shore and off-shore geological storage basins in South Africa. Two on-shore areas are being explored, namely the Zululand basin in UMkhanyakude District Municipality and the Algoa Basin in CACADU District Municipality. Findings of these studies will shift the storage potential from a theoretical level to an ‘effective’ level. The Atlas finds that South Africa has 150 giga-tonnes of theoretical storage capacity, 98% of which is off-shore. Four giga-tonnes of accessible capacity are required to store 40 million-tonnes per year for 100 years.

South Africa needs to determine its suitability for CCS, and to do this, significant capacity building, research and development must be undertaken to develop and determine the applicability for the capture, transportation and storage of CO\textsubscript{2} in South Africa.

- CCS is part of the then Department of Environmental Affairs and Tourism Long Term Mitigation Scenarios.
- CCS is one of the eight national Flagship Programmes of the White Paper on Climate Change Response Strategy.
- CCS is a component of the National Development Plan, and
- The South African CCS Roadmap has been endorsed by Cabinet on 3 May, 2012.

1.2.2. Pilot CO\textsubscript{2} Storage Project

The 2010 Atlas on Geological Storage of CO\textsubscript{2} in South Africa identifies five potential on-shore and off-shore geological storage basins in South Africa. Two on-shore areas are being explored, namely the Zululand basin in UMkhanyakude District Municipality and the Algoa Basin in CACADU District Municipality. Findings of these studies will shift the storage potential from a theoretical level to an ‘effective’ level. The Atlas finds that South Africa has 150 giga-tonnes of theoretical storage capacity, 98% of which is off-shore. Four giga-tonnes of accessible capacity are required to store 40 million-tonnes per year for 100 years.

![Figure 3](image_url)
The PCSP involves the injection, storage and monitoring of 10,000 – 50,000 tCO₂ in the South African conditions with the primary aim of:

- Demonstrating safe and secure CO₂ handling, injection, storage in particular South African geology;
- Increasing the South African human and technical capacity for the development and operation of CO₂ handling, injection, storage and monitoring;
- Raising awareness of the potential importance of CCS to the South African public; and
- Working with government to ensure that the development and operation of the PCSP can occur within the South African legal and regulatory environment.

1.3. Stakeholder Engagement for Cleaner Fossil Fuels

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. Below are the objectives for the Stakeholder Engagement Work Theme:

- Raise CCS awareness climate change mitigate 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.

1.3.1. Stakeholder Engagement Analysis

South Africa has strong requirements for stakeholder engagement which are conducted as an integral part of environmental authorisation processes. For CCS, implementing best practices for engagement in addition to complying with public participation and engagement rules is a key recommendation because of the new and complex nature of the CCS process. Stakeholders Engagement activities are informed by the World Resource Institute (WRI) Principles.

A database has been drawn to create a CCS – specific Stakeholder network, comprising of national, provincial, local government and local communities, labour unions as well as Environmental Non-Governmental Organisations. The database includes key stakeholder representatives of all sectors of society such as Traditional Authorities and Land Administrators in the KwaZulu-Natal (UMkhanyakude District Municipality) and Eastern Cape (Cacadu District Municipality).

As stakeholders are not uniform they require varying levels of consultation, ranging from information sharing to active and in-depth engagement. Analysis of key stakeholder groupings indicate that government institutions, ENGOs and conservation groups, traditional authorities and directly affected communities will require active and in-depth engagement. The latter two groupings will be especially important at the local level.

“South Africa has strong requirements for stakeholder engagement which is a prerequisite for environmental authorisation processes”
## 1.3.2. SACCCS Website Analysis

### 2010/11 to 2015/16 Website Performance

Amongst other methods/channels to achieve the aforementioned objectives is through a functioning and up-to-date website. Since being established in November 2010, traffic to the SACCCS website increased to an extent that allocated disk space of 15 gigabytes was surpassed on the hosting server. In addition, new pages, plugins, photo albums and categorised links were added to the website.

Since being first published in November 2010, has grown just over seven hundred visits to ninety three thousands that totals to over two hundred and ninety four thousands (294 611). The unique visitors have increased from just over 500 to 152 000 until March 2016.

**Figure 4. Table illustrating the website performance between 2010/11 to 2015/16 Financial Years**

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Visits</th>
<th>Hits</th>
<th>Unique Visitors</th>
</tr>
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<tbody>
<tr>
<td>2010-11</td>
<td>789</td>
<td>24815</td>
<td>519</td>
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<tr>
<td>2011-12</td>
<td>6893</td>
<td>113620</td>
<td>13634</td>
</tr>
<tr>
<td>2012-13</td>
<td>10024</td>
<td>284821</td>
<td>13634</td>
</tr>
<tr>
<td>2013-14</td>
<td>85242</td>
<td>613950</td>
<td>51251</td>
</tr>
<tr>
<td>2014-15</td>
<td>98413</td>
<td>465999</td>
<td><strong>38487</strong></td>
</tr>
<tr>
<td>2015-16</td>
<td>93250</td>
<td>413319</td>
<td>38242</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>294611</td>
<td>1922524</td>
<td>152767</td>
</tr>
</tbody>
</table>

### 2015/16 Website Performance

During the 2015/16 financial year a number of features such as search engine optimisation (SEO), keywords, plugins and monitoring tools were added to the website in order to make website administration user friendly as well as to maximise website performance.

**Figure 5. The Bar Graph below depicts the 2015/16 monthly website statistics.**
1.3.3. Stakeholder Engagement Segmentation

Figure 6. The SANEDI/SACCCS Stakeholders are segmented into six groups comprising of Government structures, ENGOs, International Peers, Academia, Industry and Traditional Authorities.

1.3.4. Basic Principles of Stakeholder Engagement

Below are the basic Stakeholder Engagement principles recommended by the World Resource Institute.

- **Local Community**
  - Understand Local Community context

- **Information Exchange**
  - Exchange Information about the Project

- **Level of Engagement**
  - Identify the appropriate level of engagement

- **Project Impacts**
  - Discuss the potential impacts of the Project

Figure 7. World Resource Institute guidelines for stakeholder engagement for CCS projects.
General CCS and Communications
The major focus of General CCS is to raise awareness on CCS as one of the portfolio of technologies that mitigate against climate change and position SANEDI/SACCCS as a leading authority for CCS activities in South Africa. During the year under review emphasise was placed on forging relations with Department of Basic Education Districts and Environmental Centres as well as raising CCS awareness at the exhibitions (STEM, Environmental and Energy events).

After numerous Engagements held with the South African National Biodiversity Institute (SANBI) Environmental Education Centre it was decided that the two organisations should form a collaboration whereby SACCCS would leverage on SANBI’s existing Education programme to raise CCS awareness. The collaboration consisted of four work packages namely; Assistant Education Officers (AEOs), Teachers Workshops, Climate Change Week and Careers Expo.

In addition, the SE team reached out to the Ndumo Environment Education Centre, Sedibeng East Education District, UMkhanyakude Education District and Nkangala Education District. Sixty six teachers participated at the CCS 101 workshops. With that said more workshops need to be conducted to capacitate the Educators in order for them to incorporate the information into their learning subjects.

A cherry on top for the SE team for the year under review was being awarded second best exhibitor certificate under Organisations’ category at the 2015 Sasol Techno X event themed *today’s minds, tomorrow’s future.*

### 2.1. Summary of General CCS Stakeholders meetings/consultations.

#### 2.1.1. South African National Biodiversity Institute (Education) Centre

In May 2015, SANBI and SANEDI/SACCCS entered into a Memorandum of Understanding. The purpose of the collaboration agreement is for SACCCS to utilise SANBI’s existing education structures to raise CCS awareness and provide career guidance to learners.

The SANBI Environmental Education Centre offers curriculum-based programmes for teachers and learners and also acts as a research site for many scientists and students. The Centre programmes are provided to school learners, educators and community members with an aim of making the beneficiaries take responsibility for their environment.

The collaboration agreement included the following work packages.

**Training for Education Assistance Officers (AEOs), 8–9 June 2015.**

The training was conducted at the SANBI Library from the 8th to 9th June 2015. The objectives of the workshop was to build capacity and impart CCS knowledge to the AEOs who will in turn incorporate the CCS information in their day to day environmental and Biodiversity workshops.

**Opportunities from the workshop**

- The workshop was a great success and it has set precedence for the three upcoming programmes.
- CCS will form part of the SANBI Environmental and Climate Change programmes and future related programmes.
- The AEOs will reach a greater audience as they interact with teachers, learners and communities on a daily basis.
- Build capacity and give career guidance to a wider audience.

SACCCS conducted a CCS 101 Workshop at the Nkangala Education District in Mpumalanga Province for Educators from Mmamethlake and Nokaneng Education Circuits. The purpose of the workshop was to impart CCS knowledge to the Educators who will in turn transfer it to the learners at their respective schools.

Illiteracy is one of the social challenges facing our rural communities (especially women) which if unattended to will continuously remain a breeding ground for poverty, joblessness, unemployment and unemployability – thus defeating the commitment of bettering the lives of Mpumalanga communities. SACCCS through the Pilot Schools Project aims to contribute or broaden the field of learning in the area through environmental, climate change, energy and more importantly CCS education. SACCCS believes that learning should not only be limited to the classroom but in a day-to-day lines of the communities.

Challenges

- Education Literacy.
- Knowledge on Climate change proved to be a challenge.

Opportunities

- SACCCS was exposed to the District’s schools programmes (Educational competitions, recycling and school gardening for underprivileged children) that SACCCS can leverage on as part of a legacy.
- More workshops on CCS are required because the knowledge of climate change and CCS is limited. This will assist the Educators to be able to integrate this in their learning programmes.

Climate Change Week, SANBI Education Centre - 11 - 14 August 2015

The SANBI Climate Change week forms a fundamental part of SACCCS’ methods of engagement and sharing information at National, Provincial and Local levels including the traditionally excluded stakeholders such as, Science/Education Centres, Environmental Non-Governmental Organisations’ (ENGOs).

Outcomes

- Most of the learners that were at the event had basic understanding of climate change, its causes and consequences.
- The learners were made to understand how they contribute to Climate Change on a daily basis and were advised to take action that will reduce their footprint.
- The learners also showed an understanding of how industrialization has contributed to the increase of greenhouse gases in the atmosphere.
- Learners were requested to participate in CCS desktop activities, namely; Creating & Capturing CO2, Identifying and Creating Greenhouse Gases and Climate Change Word Match.
- The learners were provided with information on various careers available within the CCS and Energy sector.
The Environmental Education Centre at the Pretoria National Botanical Garden hosted a Career Expo on 3 March 2016 with the aim of exposing learners to Biodiversity, environmental and science careers. One hundred and twenty Grade 10 and 11 learners from Mamelodi and Stanza Bopape Secondary schools participated. In addition, the learners were joined by the Undergraduate students from Sefako Makgatho Health Sciences University (SMU).

Present were representatives from the South African National Energy Development Institute (SANEDI), Council for Geoscience (CGS), Gauteng Department of Agriculture and Rural Development (GDARD), South African National Biodiversity Institute (SANBI) divisions and Roodeplaat Nature Reserve.

The learners were afforded an opportunity to interact with professionals in the Energy, Environmental and Geological sectors, who engaged them using presentations and hands-on activities related to their daily lives. The learners were also given information about the fields of study and necessary requirements or their career choices.

**Way Forward on the SANBI collaboration**

- As a result of this collaboration, SANBI Eastern Cape would like the programme to be replicated in their province;
- The pilot phase is completed; a consensus was reached by both organisations that the programme should be extended in order to reach other areas in the City of Tshwane and/or Gauteng; and
- SANBI should submit a proposal for the extension of the collaboration, with details of the activities for 2016/17. The implementation of this collaboration/programme will be reviewed annually.

**2.1.2. Department of Basic Education – Districts Collaboration**

SACCCS and the Department of Basic Education entered into an agreement in November 2015 to utilise the existing structures to raise CCS awareness in the country which culminated into preliminary talks with Gauteng and KZN Education Districts.

The Pilot Schools Project (PSP) aims to educate learners, teachers and communities through interactive programmes related to climate change and CCS whilst at the same time demystifying Maths, Science and Technology (MST) perceptions among learners and teachers. The project is targeted at Grade 5 – 7 learners, however the District can make recommendations with regards to the target audience and schools.
Introductory/interactive meetings were held with the Sedibeng East Education District. These meetings are in preparation for the implementation of the PSP within the Sedibeng East schools’ structures.

- Sedibeng Education District - Subject Facilitator division pointed out that Energy Efficiency forms part of the schools’ curriculum and some of the schools in the District are involved in the ESKOM energy efficiency programmes.
- The district is willing to incorporate CCS as one of its programmes.
- SACCCS indicated that working relations have been established with various government departments. Other stakeholders include the industry, Environmental NGOs, international peers and local government such as municipalities and traditional authorities.

The duration of the project will be determined after a meeting with the relevant stakeholders. It was noted that Climate Change is a reality that needs to be tackled. The project will involve learners and all key stakeholders including SACCCS staff, Educators, Principals and the District officials.

**Way forward**

- SACCCS will work with the four schools that have already been identified by SANEDI under the Working for Energy (WfE) programme.
- Sedibeng Education District suggested that a follow-up meeting must be arranged where a presentation will be conducted to the School Principals and Subject Advisors.
- Thereafter the presentation/workshops will be conducted for teachers’ and Education facilitators’.

Figure 10: Kgomoco Primary School is one of the schools already benefiting from SANEDI’s low-carbon energy initiatives
Introductory/interactive meetings were held with the UMkhangakude District Education (UKED) for the implementation of the PSP. The first meeting was held on the 8th May 2015. The purpose of the meeting was to introduce the PSP to the Subject Advisors. The second meeting was held on the 7th March 2016 to chart the way forward regarding the PSP and CCS awareness raising amongst the teaching fraternity. In addition to the implementation SACCCS aims to build beneficial working relations with the UMkhangakude Education District.

**Recommendations**
- Schools with Adult Education and Training (AET) will be roped into the project in order to involve senior community members during their afternoon classes.
- SACCCS was requested to incentivise schools by running Competitions for schools in tandem with other CCS educational activities.
- UKED suggested networking between international experts, KZN and EC Education Districts participating in the PCSP.
- The PSP should broaden the scope by focusing on learners from Grades 5 – 11.
- Grades 10 – 11 have a better understanding on issues of Climate Change and environmental issues.

**Way forward**
- CCS Workshops will be conducted by SACCCS for Teachers and Subject Specialists before the implementation of classroom activities.
- UKED will provide SACCCS with the list of schools that will be involved in the PSP.
- SACCCS will provide Science equipment and materials, budget-permitting.

![Image](image.png)  
**Figure 11.** Zandlazethu High School in UMkhangakude has been identified as one of the participating schools for the Pilot Schools Project. Image Source: Ndumo Community
2.1.3. Collaborations with Educational Science Centres

In addition to the collaborations made with the South African National Biodiversity Institute and the Department of Basic Education, SANEDI/SACCCS expanded its Pilot Schools Outreach programme by exhibiting and conducting workshops with various stakeholders. The main purpose of expanding outreach activities was to create more awareness and understanding of CCS technology through learners at national level.

Ndumo Environmental Education Centre. CCS 101 Teachers’ Workshop – 29 August 2015.

In pursuit of creating further awareness and educating school communities, especially those within the jurisdiction of the UMkhanyakude District Municipality, SACCCS conducted a CCS 101 workshop at Ndumo Environmental Education Centre on 29 August 2015. Ndumo Environmental Education Centre is an initiative of and collaboration between Ezemvelo KZN Wildlife and Tshwane University of Technology (TUT) aimed at educating and creating awareness on environmental conservation. The Centre is based at Ndumo Game Reserve within the UMkhanyakude District Municipality.

The Education Centre’s main focus, is Environmental Education “EE,” that involves teaching learners about the fundamentals of the environment and the relationship between man and surroundings. The Education Centre is in close proximity to the potential CO₂ storage sites under UMkhanyakude District. SANEDI/SACCCS association with Ndumo Environmental Education Centre is a great local platform to raise CCS and climate change awareness.

The Centre is led by Cheryl “Nomzamo” Ogilvie and is assisted by her students stationed at the Game Reserve. As part of giving back to the surrounding communities, the Centre has incorporated the social economic and bio – physical aspects of the community in the implementation of its objectives.

Recommendations/Way Forward

- SACCCS must continue to work closely with the Centre.
- SACCCS must provide participation certificates to the schools/Educators.
- SACCCS will provide assistance to interested participants.
Isibusiso Esihle Science Discovery Centre – 11 November 2015

The purpose of the meeting was to present the SANEDI/SACCCS credentials, share information on CCS and to build mutually beneficial relations with the Isibusiso Esihle Discovery Science Centre and the Community. The Centre was formerly used as a tavern. However, three years ago it was converted to an Educational Science Centre. Discussions revolved around the Centre’s educational role through its environmental awareness programmes to the schools and communities around Manguzi, KZN North.

Recommendations and Way Forward

- Isibusiso Esihle requested to be invited to participate at the Train-the-Trainer workshop for the teachers within UMkhanyakude Education District.
- Isibusiso Esihle has offered to house an exhibition stand where SANEDI/SACCCS can showcase its communications materials including a CCS model.
- SANEDI/SACCCS will consider leaving a legacy behind for the Centre.

Figure 14. Learners outside the Isibusiso Esihle Discovery Science Centre in Manguzi. KZN North.

2.1.4. Energy and Environmental Exhibitions

2015 Sustainability Week, CSIR International Convention Centre – 23 – 28 June 2015

The Sustainability Week aimed to accelerate discussions and articulate plans on becoming a climate resilient, low carbon and resource-efficient province (Gauteng). The event was held at the Council for Scientific and Industrial Research (CSIR) International Convention Centre (ICC). The 2015 Sustainability Week was different from the previous events in a way that it explored how African countries can work together to ensure a sustainable developmental path.

SACCCS participation was to raise awareness on CCS, share information on the developments of the...
of the PCSP. The SANEDI exhibition stand attracted a lot of footprint, in particular the Carbon Capture and Storage project in South Africa.

Suggestions ranged from using some of the CO$_2$ for refrigeration gas cylinders and compressors. It was emphasised that SACCCS will only be piloting on-shore with the aim of providing access to students and the public to conduct research as one way of building capacity in the country.

SANEDI/SACCCS exhibited at the 2016 Africa Energy Indaba held in Sandton from 16–17 February 2016. The Africa Energy Indaba exhibition provided SACCCS with an opportunity to showcase its work to decision makers from the energy sector in the region and Africa. The footprint at the SANEDI stand was overwhelming on both days.

Even though CCS is still mistaken with hydraulic fracturing (also known as fracking), this provided SACCCS a platform to share factual information about the benefits and potential risks associated with the CCS technology. Delegates wanted to find out about the commencement of the injection of CO$_2$. The delegates also enquired about the impact of carbon sequestration on carbon tax.
2.1.5 Career and STEM Expos’
Sasol Techno X – 3 – 7 August 2015

SANEDI/SACCCS exhibited at the Sasol Techno X held in Secunda, Mpumalanga from the 3rd – 7th August 2015, which is an annual event. The event was themed *Today’s minds, tomorrow’s future*. Sasol Techno X contributes to the development of a generation of learners to demystify Maths, Science, Engineering and Technology (STEM). Exhibition focused on displays, workshops, tours, talks and hands-on activities aimed at enthusing learners, students and the general public about the endless possibilities of science and technology.

The rationale for SACCCS participation was to:
- Raise career awareness in the disadvantaged communities.
- Raise CCS awareness to the greater community.
- Attract learners into careers that are core to STEM.
- Introduce a special award on CCS that will be featured in the future Eskom Expo for Young Scientists.

Learners visited the SANEDI stand in numbers from day one till the last day of the exhibition. Most of the learners were from the previously disadvantaged communities in grades 9 – 10 respectively.

- At the closing ceremony held on the 6th August 2015, SANEDI was awarded second best certificate under the Organisations category. categories were as follows:
  - Government departments;
  - Research and Training Institutions;
  - Educations Institutions; and
  - Industry.

![Figure 16: Left - Learners enjoying CCS educational activities. Centre - Learners participating in CCS Educational activities. Right - SANEDI staff](image)

**Eskom Regional and International Science Fair – August & October 2015**

The Expo is intended for students from South Africa and the neighbouring countries have a chance to showcase projects about their own scientific investigations. The Expo’s mission is to develop young scientists who are able to identify a problem, analyse information, find solutions and communicate findings effectively. The Expo is a platform that can be used to increase CCS awareness and climate change in relation MSTs.

The purpose for SACCCS’ participation was two-fold:
- To raise awareness on Carbon Capture and Storage (CCS), brand expansion and increase reach to greater community and Schools.
- To use the Science fair to attract learners to take CCS as their next Science project.

![Stakeholder Engagement Report 2016](image)
“Most of the learners at the 2015 Sasol Techno X were from the previously disadvantaged communities and that necessitated a multi-lingual approach in sharing information on SANEDI and Carbon Capture and Storage (CCS).”
Students were encouraged to consider CCS as a new project for the year 2016. The SACCCS SE team took part in the Eskom Expo for Young Scientists on 1st and 15th August hosted by the universities of Witwatersrand and Pretoria respectively. The Expo is designed in a way that learners are encouraged to enter their own individual projects in one of the categories. SACCCS has identified a number of categories (Geology, Climate Change Energy and Environment) in which learners can take part for the proposed SACCCS sponsored special award. The International Science Fair is the final stage of the Expo comprising of regional winners from South Africa and the neighbouring countries.

Way forward

- SACCCS will work closely with the Science Fair Directors and other stakeholders to identify learners/schools that will participate in 2016.
- SACCCS will provide assistance to interested learners.

- A need has been established to introduce CCS in the South African education system through the platforms such as the Eskom Expo.

- Other methods of recruiting more participants under the CCS Special Award will include inviting schools recommended by other relevant stakeholders.

DoE Ministerial Career Expo, Khayelitsha – 27 February 2016

The Energy Sector Career Expo was hosted by the Department of Energy (DoE) in conjunction with the Khayelitsha Education Forum with the aim of empowering Grades 10–12 learners studying Maths and Science subjects as these subjects are critical for those interested in studying energy related fields.

In addition, the Expo was aimed at ensuring that information on the energy-sector scarce skills is imparted to young professionals from various programmes within the DoE and the Department’s State Owned Entities (SOEs) such as SANEDI.

In her speech the Minister of Energy MP, Joemat-Pettersson emphasised that Maths and Science were key to pursuing careers in the energy industry.
2.1.7. Conferences


SACCCS SE representatives served on the Local Organising Committee for SAIREC (South African International Renewable Conference), an event co-hosted by DoE, SANEDI and REN21 that took place on 4 – 7 October 2015, in Cape Town. This was a great platform to position SANEDI/SACCCS to a wider audience.

SAIREC 2015 provided a “global platform for government ministers, thought leaders, private sectors players and civil society to accelerate the global scale-up of renewable energy”.

Figure 20: Left – SANEDI/SACCCS staff manning the stand. Right – Minister of Energy MP, Joemat-Pettersson visiting the SANEDI Stand.

Fourth South African CCS Conference, Capital 20 West Hotel – 20 – 21 October 2015

SACCCS in partnership with the Department of Energy, South Africa hosted the 4th Carbon Capture and Storage Conference held from 20th – 21st October 2015 at the Capital 20 West Hotel, Johannesburg.

“The theme of the Conference was “Capacitating South Africa for CCS,” which spoke to the need to build local capacity in CCS in order for the country to successfully implement the Pilot CO₂ Storage Project (PCSP). The Conference also reflected on the progress of Stakeholder Engagement outreach programmes.

Recommendations

- CCS can create minimal jobs, however it requires more promotion. SACCCS was advised to refer to the Scottish Carbon Capture & Storage case study on CCS related jobs;
- SA needs to prove CO₂ storage capability; until then it is unlikely that a CCS industry will emerge, largely due to lack of confidence in CCS in South Africa; and
- The SACCCS bursary scheme and project support was commendable. However, placement of graduates as interns in companies in SA or abroad is very important. Could the different capacity development funds be tapped here?
• Capacity development should commence at school; influence young thinkers and future decision makers. SACCCS could establish a high school program and visit schools in South Africa.

• SACCCS should play a larger role at managing and influencing CCS research, development, and education at tertiary institutions, encourage as well as the Centres of excellence.

• It is unlikely that SACCCS would support a Centre of excellence in CCS at any institution as it is a multidisciplinary field; SACCCS itself is the centre of excellence and needs to establish branches in required competencies with experts at different institutions.

• SACCCS urged to facilitate annual/biennial workshops for feedback and brainstorming where networking and connections will be established.

• SACCCS urged not to establish its own laboratories.

Figure 21. Top Left - SANEDI/CEO Mr Kevin Nassiep opening the Conference. Top Right - Ms Nikki Fisher facilitating the Stakeholder Engagement Panel discussion session. Bottom left - Delegates listening to a presentation. Bottom Right - Mr Wiseman Ngcobo conducted a presentation on Capacity Building in South Africa.
Fourth South African CCS Conference Image Gallery
Pilot Carbon Dioxide Storage Project
Stakeholder Engagement Outreach Activities
The Pilot Carbon Dioxide Storage Project (PCSP) Stakeholder Engagement outreach programme includes providing information on Carbon Capture and Storage (CCS) to key Stakeholders at National, Provincial (Regulatory & Policy Departments) and Local levels. In addition, the outreach programmes are aimed at soliciting support and buy-in from key Stakeholders for the deployment of the PCSP. It is important to follow protocol when engaging with Stakeholders.

SACCCS is working to accelerate the development of the PCSP that aims to:

(a) demonstrate CO\textsubscript{2} storage in South African conditions,

(b) gain experience and develop South African capacity in handling and storing CO\textsubscript{2}.

SACCCS has embarked on a Pilot CO\textsubscript{2} Capacity Building Monitoring Project (PMP) under the PCSP which aims to use studies of the Natural CO\textsubscript{2} Release to inform the development of a detailed monitoring plan for the PCSP.

The PMP will contribute to the global understanding of the geological controls on the development of leakage pathways from CO\textsubscript{2} storage sites, the potential impacts that such leakage might have on waters, soil and atmospheric emissions, that the unique Bongwana Natural CO\textsubscript{2} Release provide. After concerted efforts by the Stakeholder Engagement team to garner the support of AmaKhosi permission was granted for SACCCS to go ahead with the PMP. However, the AmaKhosi requested to be kept abreast and be furnished with the findings before they are released to the public.

This is a collaboration work between SANEDI, National and International organisations comprising of the University of KZN, Council for Scientific and Industrial Research (CSIR), Council of Geoscience (CGS) and the UK British Geological Survey. The Stakeholder Engagement team has been involved throughout the process engaging District, Local Municipalities and the Traditional Authorities within the areas of interest for the PMP.

3.1 Summary of PCSP SE Meetings

7 May 2015 – Mbizana Climate Change Response Strategy

SANEDI/SACCCS conducted an information-sharing presentation at the Mbizana Climate Change Response Strategy. Mbizana Local Municipality is made up of a main town and surrounding villages, located in the Eastern Cape Province connecting KwaZulu-Natal South Coastal Boundary to the N2 highway.

Mbizana is experiencing bacterial problems amongst children and adults as the community use water from Umtamvuna River for drinking and other purposes. Water samples have been taken for bacterial testing with no clear indication of what is causing the problem. The Department of Health (DoH) has taken further steps to have the samples tested for any chemicals.

Way Forward

- SACCCS was urged by SALGA representative who attended the workshop to consider participating in the National Department of Science and Technology Climate Change Forum.
- Department of Health (DoH) representative expressed interest that they would like to take part in the Pilot CO\textsubscript{2} Monitoring Capacity Building Project site visits/workshops.
- Mbizana Local Municipality Officials requested a site visit to the CO\textsubscript{2} springs located at Umtamvuna River.
12 May 2015 – Mbizana Climate Change Response workshop

SACCCS conducted a presentation on Carbon Dioxide Capture & Storage (CCS), the Pilot CO₂ Storage Project (PCSP), as well as the Pilot CO₂ Monitoring Capacity Building Project. Natural CO₂ Release in Mbizana, Eastern Cape (EC) and Harding KwaZulu-Natal (KZN) Provinces. The meeting was chaired by Councillor Msokana.

Discussions revolved around the following:

- Safety issues during the injection phase;
- Contamination of water;
- Types of equipment for monitoring.

The local Traditional Leader iNkosi Jali felt that SACCCS had a site visit without him being consulted. He emphasised that the travertine cones near Umtamvuna River are associated with cultural and traditional beliefs, and that must be respected.

Way forward

- Councillor Msokana apologised on behalf of SANEDI/SACCCS and requested to have a meeting with Nkosi Jali as a matter of urgency.
- It was agreed that SANEDI/SACCCS will be accompanied by the Mbizana Local Municipality representatives to officially present the project to iNkosi Jali.

Figure 22: Villagers use the water collected from the travertine cones for medicinal and cultural practices.
14 May 2015 – Ugu District Municipality meeting

SANEDI/SACCCS Stakeholder Engagement team met with the Ugu District Municipality. Ugu District Municipality is made up of five local municipalities: Vulamehlo, Umdoni, uMzumbe, Ray Nkonyeni and Umuziwabantu, all of which have played a critical role in the cultivation of the district’s economy.

The newly established Ray Nkonyeni Local Municipality which comprises of the now dissolved Hibiscus Coast and Ezinteleni local municipalities is the ultimate economy booster due to its location. Commercial agriculture in the district produces one-fifth of all bananas consumed in South Africa, with numerous companies successfully exporting these and other products to some of the most exclusive packers in the United Kingdom.

Ugu District Municipality is one of the municipalities that SANEDI/SACCCS worked hand-in-hand with for Phase 1 monitoring. This will be a norm/modus operandi for Phase 2 of the Pilot Monitoring Project.

- The discussions revolved around the Bongwana CO₂ Natural Release and the identified sites for the Pilot CO₂ Monitoring Capacity Building Project.
- SACCCS shared information on the proposed Work Packages including atmosphere and soil; groundwater; CO₂ migration and attenuation in the subsurface; and social impacts.
- Ugu DM recommended that SANEDI/SACCCS conduct an information-sharing presentation to the following structures as a matter of urgency:
  - Ugu Portfolio Committee (10 June 2015);
  - AmaKhosi; and
  - Farmers Association.
- SACCCS was informed that Ugu possess ambient air quality monitoring equipment which monitors sulphur dioxide, nitrogen dioxide and ozone.
- However, the equipment is immovable and it is not feasible to use for short term monitoring, in particular the Pilot CO₂ Monitoring Project.

Way forward

- Ugu to facilitate meetings with the following structures.
  - Portfolio Committee;
  - AmaKhosi; and
  - Farmers Association.
- Ugu DM to discuss the legacy issue with NW before engaging with AmaKhosi.

"SANEDI/SACCCS worked hand-in-hand with and will continue to work with the district for Phase 2 of the Pilot Monitoring Project."

Figure 23. A sealed well at the gas-work factory in Harding area
2 July 2015 – National House of Traditional House (NHTL)

SACCCS SE Lead conducted a presentation to the National House of Traditional Leaders (NHTL), for support and to solicit buy-in from the Traditional Leaders. The NHTL is a body composed of delegates from the Provincial Houses of Traditional Leaders of South Africa, representing the Provincial Houses at national level. NHTL was established to:

- Represent Traditional Leadership and their communities;
- Advance the aspirations of the Traditional Leadership and their communities at national level;
- Advance the wishes of provincial houses, Traditional Leadership and their communities at national government level;
- Influence government legislative processes at national level.

Discussions

- iNkosi Mavundla explained that the Bongwana area falls within his area of jurisdiction.
- He cautioned that he has to be consulted first before any work can be undertaken on site.
- SACCCS assured iNkosi Mavundla that all protocol will be observed. Needless to say, the SE team has commenced with the process of engaging the Local Municipalities who will in turn guide SACCCS on protocol.
- iNkosi Mhlauli commended SACCCS for showing respect and acknowledging the cultural beliefs and norms of the Bongwana communities.
- In addition conceded that Isinuka/herbal spring at Bongwana is believed to heal all types of ailments and is regarded as a sacred place.
- SACCCS was urged to use vernacular when engaging the communities. This will assist in ensuring that the affected communities get a better understanding of what the project entails well before its commencement.

Recommendations and Way forward

- SACCCS was urged to refrain from using the term “Chief/s” with immediate effect, it must be replaced with AmaKhosi.
- iNkosi Mavundla requested the presentation to be in vernacular when addressing the affected communities so that they can be able to understand the project and inquire more about the technology should a need arise.
- iNkosi Mavundla requested SACCCS to consider CCS capacity building for Local Authorities and communities as well as to consider providing sponsorships/bursaries. He further stated that the Amakhosi would appreciate exposure to be given to the locals by getting them involved in the project.
- SACCCS was requested to conduct a visit to the Pilot Monitoring Project sites.
- The Chairperson invited SACCCS to contact the Provincial Houses of Traditional Leaders (PHTL) for further guidance should a need arise.

5 July 2015 – The Council for Scientific and Industrial Research (CSIR)

A meeting was held with Aziwtamisi Mudau (Researcher) in preparation for the Pilot Monitoring Project Phase one, which entails collecting water, soil and atmosphere CO₂ sample for laboratory testing. CSIR is one of the leading scientific and technology research, development and implementation organisations in Africa. It undertakes directed research and development for socio-economic growth. The PMP is a research project that aims to use the Bongwana PMP study to inform a more detailed PCSP monitoring plan. SACCCS will draft a proposal outlining CSIR’s involvement in the Monitoring Project. The proposal will include the breakdown for manpower, equipment and costs which may be needed for the monitoring.

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Mr Thulani Maupa, the PCSP Technical Manager is responsible to engage with the following institutions for capacity building component:

- University of KwaZulu-Natal (UKZN); and
- University of Free State (UFS).

CSIR would be able to engage an intern to assist with long term monitoring especially the CO$_2$ observation at the Bongwana site. Environmental Impact Assessment (EIA) will be required, especially if the CSIR is to set-up a monitoring station. Doing this on privately-owned land might be quicker than on state-owned land. A site visit to familiarise the CSIR with the site will be undertaken once all access issues have been complied with so that the right equipment can be procured.

9 July 2015 - KZN CoGTA: Ugu Local House of Traditional Leaders EXCO

The purpose of the meeting was to share information on Carbon Capture and Storage (CCS) in South Africa and the proposed Pilot CO$_2$ Monitoring Capacity Building Project at the Bongwana Natural CO$_2$ Release sites within Ugu District Municipality as well as to garner support and request permission for SANEDI to conduct the monitoring project.

Meeting deliberations were as follows:

- KZN CoGTA: ULHTL requested to be provided with the names of the sites targeted for the Pilot Monitoring Project so as to ensure that relevant AmaKhosi are informed and engaged.
- KZN CoGTA: ULHTL support the monitoring project in principle provided that all protocols are observed.
- KZN CoGTA: ULHTL highlighted that they do not want to be used as guinea pigs. Organisations have conducted studies within the region (Ugu) through Local Municipalities and other existing structures with no benefits for the communities. Therefore, it was recommended that alegacy be left behind for the communities even if it's through internships or international exchange programmes.
- KZN CoGTA: ULHTL recommended that SACCCS must liaise with AmaKhosi from the affected communities once the sites have been positively identified.
- KZN CoGTA: ULHTL advised SANEDI/SACCCS to be transparent throughout the Project and they requested to be kept abreast of the developments of both the PCSP and Pilot Monitoring Project.

Way forward

SACCCS must provide a response in writing, the response must incorporate the following:

- How will the Project benefit the affected communities?
- Skills transfer plan for the locals.
- Besides SANEDI, who else will be involved in the project?
The Algoa Basin falls within the Sundays River Valley Local Municipality in Eastern Cape Province. The purpose of the meeting was to conduct a presentation to the Mayoral Committee regarding CCS and the PCSP as well as to address any questions/concerns they might have regarding the technology.

- Councillor Delport shared information with SACCCS and the SRVM members about the study undertaken by a professor at the Rhodes University on the Geology of the Algoa Basin.
- The professor conducted the study at a thousand km (1000) in the subsurface and found that the Kirkwood baseline is shallow and contains fresh water.
- Polly Modiko – Stakeholder Engagement Lead, assured Councillor Delport that the PCSP will not be sited in the no-go areas. SACCCS will stay clear of fresh water.

Recommendations and Way forward

- The Municipal Manager: Lonwabo Ngoqo requested that the meeting should not be used to tick the box. SACCCS should keep the municipality abreast of the developments with regard to the project.

Figure 24. Tourism is one of the key economic contributors in the Sunday River Valley Local Municipality.
Image Source: SA-Venues

29 July 2015 – KwaMthimude Tribal Authority

SACCCS conducted presentations on Carbon Dioxide Capture & Storage (CCS), the Pilot CO₂ Storage Project (PCSP), as well as the Pilot CO₂ Monitoring Capacity Building Project (PMP) – Bongwana Natural CO₂ Release at KwaMthimude Tribal Court led by iNkosi WT Mavundla. InKosi Mavundla and the community leaders supports the Pilot Monitoring Project to be conducted, provided a feedback session is scheduled to keep the community leaders abreast of the sample takings.

Way forward

- INKosi Mavundla requested that SANEDI/SACCCS conduct a presentation to the Headmen and few representatives of the communities. This should be done after sample takings schedule for September 2015.
3 September - National House of Traditional House – EXCO, Bongwana Site Visit
During the meeting of the 2 July 2015 the NHTL requested SACCCS for a site visit to the Bongwana area. The site visit took place on 3rd September, Mr. Landi Themba, Director of Coal and Gas Policy addressed The NHTL EXCO Members and the KZN Provincial House of Traditional Leaders (PHTL) on Carbon Capture and Storage (CCS) and the Pilot CO₂ Monitoring Project at Bongwana. He explained the role of the DoE and SACCCS on the Monitoring Project. Mr Themba emphasised that stakeholders, Amakhosi, culture and indigenisation should be respected, citing a case of the late Sara Baartman having been humiliated, displayed as a freak because of her unusual physical features.

The purpose of the site visit for the Traditional Leaders and the Municipality was to; familiarise all interested stakeholders with the areas targeted for monitoring, outline the objectives and overall plan of the Pilot Monitoring Project (PMP) and address any concerns/issues related to the PMP. One of the most important lesson learned is that a day is not sufficient to cover both provinces given the number of questions/concerns raised as well as the distance between the two provinces.

Coupled with the above, cultural beliefs must be respected at all times and a lot has been learned through impartation of Indigenous Knowledge. The site visit was preceded by numerous consultations/presentations to the relevant structures in both provinces, namely, KZN & the EC.

23th – 28th September Bongwana Phase 1 study - Local and International Collaboration
In 2015, following the operationalisation of the Pilot CO₂ Storage Project (PCSP) and the appointment of the PCSP Technical Manager, the Pilot CO₂ Monitoring Capacity Building Project was initiated and a draft work plan programme for Phase 1 of the project. Phase 1 is designed to inform each of the work packages which will involve a more comprehensive analysis. In order to expedite the start of Phase 1, it will be facilitated by the PCSP Division of SACCCS with support from the Council for Geosciences (CGS). A team from the PCSP and CGS staff including geohydrologists, geophysicists and structural and mapping scientists, led field excursions within Phase 1 and took part in combined

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research with the international team to increase local expertise in CCS technologies. The aim of this research is to include academic and professional staff from universities and research organisations. An invitation was extended to a number of institutions of Higher Learning including the University of Pretoria (UP), University of the Witwatersrand (Wits), the University of KwaZulu-Natal (UKZN), and the University of the Western Cape (UWC), targeting mainly the CCS researchers and beneficiaries of the SACCCS/PCSP Bursary Programme. The invite was also sent to the Groundwater Unit based at the University of the Free State (UFS). A Masters candidate from UKZN, who is also a beneficiary of the SACCCS/PCSP Bursary programme, was the only participant on the programme from the invited institutions.

This initial phase of the research programme was also to utilise CO\textsubscript{2} detection and monitoring equipment that is already owned by research organisations in South Africa. United Kingdom based researchers subsequently responded positively to the invite and SACCCS agreed to go ahead with the programme.

Way forward

A workshop will be organised once the Phase one results have been obtained (i) to inform a long-term monitoring programme and an invitation will be extended to other organisations via “A call for Research Proposals” to be forwarded to all identified organisations and (ii) to inform the stakeholders of KwaZulu-Natal and the Eastern Cape of the findings thereof.

30 September – National Department of Water and Sanitation (DW&S)

The SANEDI/SACCCS team held an iterative meeting Chaired by the Deputy Director General, Information and Planning – Ms Deborah Mochetlhi together with the DW&S regulatory delegation. Subsequent to our initial meeting a technical team was established by the DW&S to discuss the presentation on CCS and chart way forward.

Way Forward

- SACCCS was informed that DWS South Africa has entered into a trans-boundary agreement with the neighbouring countries.
- The Technical team will provide a comprehensive report on CCS for discussion by DW&S Information and Planning as well as the Policy and Regulatory directorate.
- SACCCS will be provided with the saline aquifers map to assist in the planning for the PCSP.

Figure 26: Top Left – Members arriving for PMP field trip. Top Right – Team members crossing the Umtamvuna River. Bottom Left – Collection of CO\textsubscript{2} flux from the water. Bottom Right – Collection of CO\textsubscript{2} samples from a travertine cone.
28 October – Izibonda Tribal Court
Consultations were held at the Izibonda Traditional Court, one of the Bongwana sites which fall under the jurisdiction of iNkosi Machi. The discussions revolved around the Bongwana fault and the work packages that SACCCS will be undertaking in phase 1 and 2 of the research programme.

Way forward
The Council cautioned SACCCS that the areas of interest are sacred to the community, affectionately known as Ugqomo and as such must be treated with respect. SANEDI/SACCCS was urged to observe protocol at all times. The Tribal Committee requested a more detailed plan including images and information on what needs to be undertaken in the area.

29 October – KZN, Department of Mineral Resources (DMR)
SANEDI/SACCCS held an iterative meeting with KZN DMR and the purpose of the meeting was to:
- Provide an update on the South African CCS Roadmap;
- Update on consultations undertaken thus far with policy, regulatory and environmental Stakeholders; and
- Follow-up on the permitting application submitted by the Council for GeoSciences on behalf of SANEDI.

Way forward
- Mr Sizo Mkhize (SM) Mining Environmental Management to make a follow-up on the Section 50 (1) application submitted by CGS.
- The application will be treated differently as it is not a mining prospecting permit.
- DMR will regroup internally and will revert to SANEDI/SACCCS within two weeks (16 November 2015).
11 November - KZN. The Department of Environmental Affairs (DEA)

An iterative meeting was held with KZN DEA Empowerment Unit to provide an update on PCSP activities since 2013. DEA is mandated by the government to give an effect to the right of citizens to an environment that is not harmful to their health or well-being, and to have the environment protected for the benefit of present and future generations. To this end, the department provides leadership in environmental management, conservation and protection towards sustainability for the benefit of South Africans and the global community.

Discussions included the following:
- KZN DEA were concerned about contamination of potable water as the communities rely on groundwater on it. Furthermore, it was emphasised that the communities are already experiencing water scarcity in the area.

Recommendations/Way Forward
- Zama Mathenjwa – District Manager at KZN DEA requested SANEDI to positively identify the potential sites so as to assist DEA KZN to advise accordingly.
- DEA will workshop the Act namely, NEMA and WMA to see what type of a permit is necessary for the CCS exploration.
- KZN DEA requested to be capacitated in a form of a workshop on CCS to help them understand the technology better.
- KZN DEA will play a facilitating role for SANEDI to reach out to the communities that might be affected by the FCSP.

12 November - UMkhanyakude Portfolio Committee for PED

The Purpose of the meeting was to share information on SACCCS’s activities since the initial meeting that was held on 5 November 2013 and provide feedback on the South African CCS Roadmap. The meeting was held with the Chairperson of Planning and Economic Development (PED) and his department.

Discussion of the meeting revolved around the following.
- Sourcing of carbon dioxide (CO₂) within the UMkhanyakude District Municipality (UKDM) as the emissions are high in the area. This in turn will make the project appealing to the local communities.
- It was stressed that the District is facing water scarcity, as a result SANEDI/SACCCS was urged to steer clear from contaminating water during the drilling and injection of CO₂ storage.
- The legacy issue was raised. SANEDI was requested to consider leaving a legacy for the communities that will be affected by the PCSP.
- The SE Lead stressed that SANEDI will work with the Municipality with regard to leaving a legacy. This will involve a needs analysis to ensure that communities benefit from the PCSP, budget permitting.
- It was recommended that the PCSP should not be seen as the project of the Department of Energy alone but the Government as a whole.
- SACCCS mentioned that Climate Change is affecting the country and the world. To this end, the DoE has established an Inter - Departmental Task Team (IDTT) to develop legislation for CCS in South Africa. SACCCS was urged to advise the AmaKhosi that the initial phase involves exploration and not the injection per se whereby seismic activities will be conducted to ascertain the suitability of UMkhanyakude Basin for CO₂ injection.
Recommendations/Way Forward

- SACCCS was urged to give regular updates on the PCSP.
- SACCCS must peruse the adopted UMkhanyakude Environmental Management Framework document.
- SACCCS was invited to present to the ExCo at a meeting scheduled for 17 November 2015.
- SACCCS will provide the UKDM with the PCSP Concept Note for the benefit of the Senior Management of UKDM.
- UDKM offered to avail an official to accompany SANEDI when reaching out to the Traditional Authorities, especially those from the communities that might be affected by the PCSP.
- SACCCS will provide the UKDM with a draft MoU.

19 November KZN. Dep. of Economic Dev. Tourism and Environmental Affairs (EDTEA)

The KwaZulu-Natal Department of Economic Development and Environmental Affairs is mandated to oversee the socio-economic transformation in the province. It therefore leads the policy and strategic initiatives directed at promoting development and growth in various sectors of the economy. However, to achieve its objectives, the Department has to co-operate with various stakeholders and social partners that include the private sector and civil society.

The purpose of the meeting was to,

- To provide feedback on the status of the Pilot CO₂ Storage Project (PCSP).
- To seek guidance in terms of lodging an Environmental Impact Assessment (EIA) application for the exploration phase.
- To maintain mutual beneficial working relations with KZN EDTEA in respect of the PCSP.

There was an in-depth discussion around the role the Department of Environment Affairs (DEA) will play with regards to the Environmental Impact Assessment (EIA) for the PCSP. DEA mentioned that the SANEDI/SACCCS have to lodge an application for the Environmental Impact Assessment to the National Office. The National Office will work together with the Regional Offices (in the Eastern Cape & KwaZulu-Natal) in regulating the application. There were debates on how CO₂ can be classified i.e. Waste or commodity.

A decision to this will assist the Department in regulating the EIA application properly. KZN EDTEA recommended that SANEDI/SACCCS should consider awarding Renewable Energy (RE) or Green Vouchers to the communities that might be affected by the PCSP as one of the options of leaving a legacy. RE or Green Vouchers support national and regional eco-innovation objectives such as CO₂ emission reduction, introduction of renewable energies and investments in energy efficiency. Communities can benefit by selling the vouchers to the Small, Medium and Micro-sized Enterprises (SMME’s) and industry.

“SANEDI/SACCCS should consider awarding Renewable Energy (RE) or Green Vouchers to the communities that might be affected by the PCSP.”
SALGA is an autonomous association of municipalities with its mandate derived from the Constitution of the Republic of South Africa. This mandate defines SALGA as the voice and sole representative of local government. SALGA interfaces with parliament, the National Council of Provinces (NCOP), cabinet as well as provincial legislatures. An Iterative meeting was held with SALGA following a meeting held in 2014.

Discussion

- KZN SALGA recommended that SANEDI/SACCCS must consult with all wards within UMkhan-yakude District so that the communities understand what the PCSP entails.
- KZN SALGA requested that SANEDI/SACCCS work in collaboration with the South African Local Government Association (SALGA) in addressing the Climate Change/Waste Management issues, especially within the UMkhan-yakude District.
- The collaboration will include the Pilot CO₂ Monitoring Capacity Building Project in the South Coast Region as the area falls within KwaZulu-Natal (KZN) SALGA’s jurisdiction.

Recommendations/Way Forward

- KZN SALGA requested SANEDI/SACCCS to conduct a presentation at the Renewable Energy Working Group taking place on 4 December 2015.
- KZN SALGA requested to be furnished with copies of the papers on Isinuka.
30 November 2015 – KZN Department of Rural Development and Land Reform (DRDLR).

SANEDI/SACCCS met with the KZN Department of Rural Development & Land Reform’s Land Claims Office. The DRDLR is a ministry dedicated to the social and economic development of rural South Africa. The department is responsible for sustainable land and agrarian transformation. The aim of the department is to increase agricultural production through the optimal and sustainable use of natural resources and appropriate technologies to ensure food security, dignity and improved rural livelihoods. Secondly their focus is on improving both economic infrastructure and social infrastructure to successfully achieve this, ownership of processes, projects and programmes is vital DRDLR.

DRDLR mentioned that the department received a list of the potential sites from SANEDI/SACCCS and the Senior Administration Officer is investigating the landownership thereof. DRDLR stressed the importance of benefiting the communities that will be affected by the PCSP.

SANEDI/SACCCS indicated that legacy will be considered for the affected communities. SANEDI/SACCCS will ensure that consultations are held with relevant communities, landowners and land claimants.

Way forward

- DRDRL will check the land properties (GPS coordinates) against the gazetted land claims.
- DRDRL will follow-up with the Senior Administrator regarding the land ownership of the potential sites submitted by SANEDI/SACCCS to the KZN Land Reform & Claims Department.
- SANEDI/SACCCS will ensure that consultations are held with relevant communities, landowners and land claimants.

1 December 2015 – Amafa/Heritage KZN.

An iterative meeting was held with Amafa/Heritage KZN (Amafa) to give progress on the South African CCS Roadmap since the first meeting held on 21 October in 2014. Amafa / Heritage is the provincial Heritage Conservation Agency for KwaZulu-Natal. Amafa was established as a statutory body in terms of the KZN Heritage Act of 1997, replaced by the KZN Heritage Act of 2008. The Council of Amafa is appointed by the Premier of KZN, and is funded through a grant from the same department. Amafa manages several major heritage projects such as the Isandlwana Battlefield, Border Cave archaeological site and the KwaZulu Cultural Museum.

Amafa advised SANEDI/SACCCS to:

- The importance of abiding to the 5km radius from the Provincial Heritage or Archaeological Sites.
- Amafa highlighted that 10km buffer-zone must be adhered to for the World Heritage Sites.
- SANEDI/SACCCS was urged to advise the AmaKhosi that the initial phase involves exploration and not the injection per se whereby seismic activities will be conducted to ascertain the suitability of UMkhanyakude Basin for CO\textsubscript{2} injection.
- Amafa/Heritage KZN strongly recommended that the exploration phase must include the following prerequisites for the Environmental Impact Assessment:
  - Heritage Impact Assessment;
  - Archaeology Survey; and/or Paleontological Impact Assessment; and
  - The desktop Paleontological Impact Assessment will be crucial for the drilling phase.
- Amafa further recommended that SANEDI/SACCCS must follow proper procurement procedures in enlisting the services of the Archaeologist Specialist.
9 December 2015 – KZN, Provincial House of Traditional Leaders

An introductory meeting was held with the KZN. Provincial House Traditional Leaders (PHTL) which resorts within the KZN. CoGTA ministry. The purpose of the meeting was to present the PCSP to the Provincial House which consists of Local Traditional Leaders of UMkhanyakude District Municipality and Umhlabuyalingana Local Municipality. As protocol dedicates engagements with Government structures start at the National level and cascade to Provincial and Local levels.

The Provincial House of Traditional Leaders may advise and make proposals and other recommendations to the Provincial Government, through the office of the responsible Member of the Executive Council, with respect to:

- Legislation or matters affecting Traditional Leaders, Traditional Councils or communities; and
- Legislation and matters pertaining to Zulu custom and tradition, or such other matters in respect of which the responsible Member of the Executive Council has invited comment.

Discussions

- Inkosi P. Chiliza - Chairperson of the PHTL emphasised the importance of the working relations between SANEDI/SACCCS, the Department of Mineral Resource and the Department of Energy as the project needs to be regulated by relevant departments.
- In addition he reiterated the importance of technologies that help in reducing Greenhouse Gas (GHG) emissions as the province is currently experiencing severe climate weather changes and drought.
- The Chairperson shared his experience and observations about the Bongwana field trip that was undertaken with the NHTL: EXCO members on 3 September 2015. He cautioned that research should not undermine traditional beliefs and in turn traditional beliefs should not shadow the development of technologies.
- The PHTL indicated its unequivocal support for the development of the Pilot CO$_2$ Storage Project (PCSP).

Recommendations/Way Forward

- The PHTL indicated its unequivocal support for the development of the Pilot CO$_2$ Storage Project (PCSP).

15 December KZN, CoGTA – Spatial Planning

An iterative meeting was held with Ms Amanda Zungu – Chief Planner: Spatial Planning Division to provide progress of the South African CCS Roadmap and to ascertain any spatial plans in the potential sites for the PCSP. The purpose of the KZN. Spatial Planning in the province is to provide for land use management, spatial planning and geo-spatial information services at provincial level.

The Department expressed sentiments on behalf of the Spatial Planning division acknowledging its satisfaction about the harmonious working relations forged between SANEDI and UMkhanyakude District Municipality.

Recommendations/Way Forward

- The KZN. Spatial Planning gave an in-principle support towards the development of the Pilot CO$_2$ Storage Project (PCSP). The Division will inform SANEDI/SACCCS should the Department have spatial plans in the PCSP Potential sites.

“**Inkosi P. Chiliza – Chairperson of the PHTL emphasised the importance of the strengthening working relations between SANEDI/SACCCS, the Department of Mineral Resource and the Department of Energy as the project needs to be regulated by relevant departments.**”
An introductory meeting was held with the Risk Reduction & Planning division. The meeting was as a result of a recommendation by the Gauteng Provincial Disaster Management Advisory Forum. The KZN PDMC was established under Chapter Four of the National Disaster Management Act No 57 of 2002.

The Act provides for an integrated and coordinated disaster management policy which focuses on:

- Preventing or reducing the risk of disasters
- Mitigating the severity of disasters
- Rapid and effective response to disasters and post-disaster recovery and
- Enhancing disaster management efforts

KZN PDMC requested the involvement of the department prior, during and post deployment of the PCSP as well as CCS 101 workshops for officials. KZN PDMC cautioned SANEDI/SACCCS that the PCSP could be hampered by the rejection from private landowners, as it has been the case with other projects in the province. To this end, KZN PDMC commended SANEDI/SACCCS for reaching out proactively.

**Way forward**

KZN PDMC must be involved prior-, during and post- deployment of the PCSP to ensure compliance with risk and safety measures.

KZN PDMC has undertaken to approach the Deeds Office in order to identify landowners of the potential storage sites.
In addition, the absence of the regulation may hinder ITB to make an informed decision on SANEDI/SACCCS’ request to undertake exploration work without guidance by the regulatory statutes.

**Way Forward**
- Ingonyama Trust MANCO screens the presentations conducted by organisations for recommendation to the Board.
- ITB will inform SANEDI/SACCCS about the decision made by MANCO regarding its presentation.

**9 February – iSimangaliso Wetland Park Authority**

An iterative meeting was held to give progress on the South African Roadmap. The iSimangaliso Wetland Park was listed as South Africa’s first World Heritage Site in December 1999 in recognition of its superlative natural beauty and unique global values. The 332 000 hectare Park contains three major lake systems, eight interlinking ecosystems, 700 year old fishing traditions, most of South Africa’s remaining swamp forests, Africa’s largest estuarine system, 526 bird species and 25 000 year-old vegetated coastal dunes – among the highest in the world.

The purpose of the meeting was.
- To provide feedback after the initial meeting held on 21 March 2014.
- To maintain working relations with the iSimangaliso Wetland Park Authority (IWPA) with regards to the Pilot CO₂ Storage Project (PCSP).
- To request for permission to undertake the basin exploration within UMkhanyakude District.

Discussions revolved around the PCSP and the associated impacts on human, environment and groundwater. iSimangaliso reiterated that no work must be undertaken within the 10km zone of the World Heritage Site. An in-depth discussion looked into the regulatory framework and the possible Acts the SANEDI/SACCCS should comply with when undertaking the exploration work. iSimangaliso requested a map indicating the potential sites and geological readings within UMkhanyakude District Municipality.

**Way Forward**
- SANEDI/SACCCS must furnish iSimangaliso Wetland Park Authority with the maps including geological data and potential sites as a matter of urgency.
- On receipt of the map the iSimangaliso will submit same to their Geological Information Systems department for verification of the no-go areas and will advise SANEDI accordingly.
Subsequent to the presentation by SANEDI to the ITB MANCO responsible for screening all presentations before tabling to the Board on 8 February, the SE team was invited to present to the Board meeting for a final vetting before permit can be granted for the Basin Exploration.

**The purpose of the meeting entailed.**

- To share information on the Carbon Capture and Storage (CCS) and Pilot CO\textsubscript{2} Storage Project (PCSP).
- To cement working relations with the Ingonyama Trust Board (ITB).
- To request for permission to undertake the basin exploration within UMkhanyakude District.

Discussions revolved around safety issues related to CCS. ITB members raised a concern that CO\textsubscript{2} storage might encourage communities to embark on mining or hydraulic fracturing activities within the site. Mr Noel Kamrajh, the PCSP Manager assured the Board that SANEDI is working closely with the Council for Geoscience (CGS), a state geological repository. In addition, SANEDI will not store in the basin that has oil or gas. This information will be known after the Basin Exploration has been undertaken. The ITB Board members strongly felt that CCS is being imposed on poor communities meanwhile most of the CO\textsubscript{2} emissions are derived in places such as Mpumalanga and Limpopo among others. [Not In My Back Yard principle]. The ITB emphasised that SANEDI must address both the positives and negatives for CCS because like any technology there are risks associated to it. The PCSP Manager and SE Analyst mentioned that the worst that could happen in a CCS project is leakage. However, risks are minimised by the prefeasibility studies including basin exploration and site characterisation. Chances of leakage are minimised as the CO\textsubscript{2} injection wells are constructed in very high standards and monitored rigorously.

Furthermore, storage sites are carefully chosen and studied to ensure that the chance of CO\textsubscript{2} escaping from the storage reservoir(s) into surrounding rocks is very low. No leakages have been detected to-date from the existing CCS projects. SANEDI will conform to all the requisite statutes.

The other risk is potential impact on groundwater. The injection well has different layers of cement and metal casing all the way down to the storage reservoir (suitable rock formations) in order to protect drinking water and the environment. For example, CO\textsubscript{2} pressure and temperatures are monitored both inside the well casing and between the casing as well as the surrounding rocks and groundwater levels. Should a leakage be detected, International Best Procedures practiced in the oil and gas industry will be used to repair or remediate the imperfection.

**Recommendations/Way Forward**

The Board requested more information about the PCSP and CCS technology in general. In addition, detailed information about the sites for the Basin Exploration such as the following.

How much land is required in the surface and sub-surface?
- What technology will be used for the basin assessment and injection of CO\textsubscript{2}?
- Case studies of the similar projects internationally.
- What legislation will be used for the CCS technology?

The decision regarding the permit will only be made on receipt of the information requested above. In this regard, the Board urged that SANEDI should not continue with the consultations with the Interested and Affected Parties (I&APs) until such time a decision has been made regarding the permit to undertake basin assessment.
4. Future Plans

Going forward, the 2016/17 PCSP and General CCS and Communications Stakeholder Engagement activities will continue to focus on consultation with relevant key stakeholder sectors/groups, including government (national, provincial and local); traditional authorities; public utilities, NGOs and environmental groups; research and academia; business and commerce; labour; landowners. The annual Integrated Communications Action Plans (ICAPs) will be reviewed and will incorporate suggestions from Stakeholders.

5. Conclusion

The Stakeholder Engagement Work Theme has progressed exponentially. Therefore continuous consultation is imperative as public acceptance is key to successful permitting. To this end, ongoing public outreach and education pre-, during and post- Pilot CO₂ Storage Project (PCSP) will continue to play a pivotal role. Rapport has been established with the relevant National, Provincial and Local structures. Key messages were developed and will be supported by a wide variety of communications materials enshrined in the Nat- Loc Plans. The concerns/issues Logbook is updated on an ongoing basis.

On the whole, Stakeholders are supportive of the PCSP and requested to be kept abreast of the development as the project unfolds. Engagement activities for the feasibility/exploration phase will focus on the interested and affected parties (I&APs) and address the legacy issue “what’s in it for us” which has been raised by the Stakeholders.