



Strategic Analysis of the Global Status of Carbon Capture and Storage

Report 3: Country Studies
South Africa

Final Report



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This report:

- 1. states the law current as at 31 March 2009*
- 2. should not be relied upon as a substitute for specific legal advice*
- 3. has links and references throughout that were current as at 31 March 2009*
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1. Executive summary

There is no integrated policy or legislation currently to specifically deal with CCS in the Republic of South Africa (South Africa). However, in recent years South Africa has moved towards adopting a climate change policy, and CCS is likely to be central to that policy.

The Long Term Mitigation Scenario Study (LTMS) highlighted CCS as being a potential method of CO₂ emissions mitigation for South Africa. Following this study, the Department of Environmental Affairs and Tourism (DEAT) stated that one of its objectives was "exploring and developing CCS for coal fired power stations and all coal-to-liquid (CTL) plants, and not to approve new coal fired power stations without CO₂ capture readiness". DEAT also stated that a climate change policy is expected to be implemented by 2010 and a legislative, regulatory and fiscal package is planned to be introduced by 2012.

It is therefore clear that CCS is expected to play a vital role in South Africa's drive to mitigate its CO₂ emissions. The South African government has declared CCS to be a national research priority and this commitment is underlined by South Africa's membership of the CSLF since 2003.

The recently established South African National Energy Research Institute (SANERI) launched a National Centre for CCS on 27 March 2009. This research centre will drive CCS initiatives in South Africa, with the ultimate goal of undertaking a CO₂ injection experiment by 2016 and the construction of a CCS demonstration plant by 2020. The Centre receives funding from the British High Commission, the Norwegian Government and from industry.

In addition a detailed study to identify and assess potential CO₂ storage sites in South Africa is being undertaken in the form of the Carbon Geological Storage Atlas. The Atlas is expected to be completed by mid-2010 and also draws funding from both government and industry.

2. Glossary

AQA	The National Environmental Management Air Quality Act 39 of 2004
CCS	Carbon Capture and Storage
Constitution	The Constitution of the Republic of South Africa
CSIR	The Council for Scientific and Industrial Research
CSLF	The Carbon Sequestration Leadership Forum
CTL	Coal to liquid
DEAT	The Department of Environmental Affairs and Tourism
DME	The Department of Minerals and Energy
DWAF	The Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
FIT	Feed-in Tariffs
LTMS	The Long Term Mitigation Scenario study
MTPPP	Medium Term Power Purchase Program
MPRDA	The Mineral and Petroleum Resources Development Act 2002
NEMA	The National Environmental Management Act 1998
NERSA	The National Energy Regulator of South Africa
PPA	Power Purchase Agreement
RE	Renewable Energy
REPA	Renewable Energy Power Purchase Agency
REFIT	Renewable Energy Feed in Tariff
SANERI	The South African National Energy Research Institute
SAR	South African Rand
South Africa	The Republic of South Africa

3. CO₂ pricing

3.1 Introduction

At present no integrated policy or legislation exists in South Africa which imposes a cost on GHG emissions. However, in recent years the South Africa government has been working towards a policy to tackle its high level of emissions, with plans for a legislative, regulatory and fiscal package to be implemented before the end of 2012. This may include measures to impose a cost on GHG emissions, but it seems certain that CCS will also play a central role given that the South African government has declared CCS to be a national research priority.

In July 2008, DEAT announced the completion of its Long Term Mitigation Scenario Study (LTMS) (Van Schalkwyk, 2008). The Study was launched in 2006 to examine the potential for mitigating South Africa's GHG emissions (DEAT, 2007). Research teams produced information that was discussed by a Scenario Building Team comprising strategic thinkers from a range of government departments, key industry players and society. The study highlighted the need for action, forecasting that without constraints South Africa's emissions of CO₂ equivalent would quadruple by 2050 to 1,640 million tons, from a base of 446 million tons in 2003.

The study reviewed a number of possible counter measures, including market-based instruments, CCS and the extension of renewable and nuclear energy sources. In regard to measures imposing a cost on GHG emissions, the study projected that an escalating CO₂ tax would cut emissions by more than 600 million tons by 2050. However the study found that the "largest potential reduction of industrial process emissions results from CCS".

Following the study DEAT set out its vision for climate policy, along with a mitigation strategy and a framework for the implementation of a climate change policy. DEAT's strategy involved increasing the price of CO₂ through an escalating CO₂ tax or an alternative market mechanism, but also included incentives for renewable energy through feed-in tariffs and exploring and developing CCS for coal fired power stations and all coal-to-liquid plants.

Work on the draft climate change policy began in March this year following deliberations at the third annual South African Climate Change Summit. A Green Paper on Climate Change Policy is expected to be published for public comment in April 2010, with a Final National Climate Change Response Policy to be published by the end of 2010. The process will culminate in the introduction of a legislative, regulatory and fiscal package to give effect to DEAT's strategic direction and policy by the end of 2012 (DEAT, 2009).

3.2 CO₂ taxation schemes

No CO₂ taxation scheme currently exists in South Africa. However a CO₂ taxation scheme may form part of South Africa's planned climate change policy, expected to be published by the end of 2010.

A CO₂ tax was researched under the LTMS as a potential measure to mitigate GHG emissions. The study projected that an escalating CO₂ tax would have the effect of cutting emissions by more than 600 million tons by 2050. It recommended that a CO₂ tax be used in conjunction with market incentives.

Following the study, DEAT set out in its climate strategy that “regulatory mechanisms ... will be combined with economic instruments such as taxes and incentives under the Use the Market strategic option, with a view to ... increasing the price on CO₂ through an escalating CO₂ tax, or an alternative market mechanism.”

The closest South Africa has come to a CO₂ tax was the imposition in January 2008 of a SAR 0.02 per kilowatt-hour levy on non-renewable sources of electricity.

3.3 Indirect cost imposition: renewable energy schemes

3.3.1 Portfolio energy standards

No legislation or policy exists that requires an increased production of energy from renewable energy sources.

The Department of Minerals and Energy (DME) and the National Energy Regulator of South Africa (NERSA) considered a renewable energy portfolio standard as one of a number of measures that could promote the development of renewable energy in South Africa. DME's White Paper, published in 2003, set the target of 10,000 GWh renewable energy contribution to final energy consumption by 2013. However, NERSA has decided to pursue the implementation of a feed-in tariff rather than a renewable energy portfolio standard.

3.3.2 Feed-in tariffs

DEAT's mitigation strategy announced in July 2008 included both “diversifying the energy mix away from coal” and “incentivising renewable energy through feed-in tariffs”.

On 26 March 2009, NERSA approved the Renewable Energy Feed-In Tariff (REFIT) Guidelines (NERSA, 2009). NERSA approved the REFIT Guidelines as follows:

- Feed-in Tariffs (FITs) based on the Levelised Cost of Electricity, as illustrated in Table 3-1 below:

Table 3-1 REFIT tariffs – 2009 (SAR/kWh)

Technology	Unit	REFIT
Wind	SAR/kWh	1.25
Small hydro	SAR/kWh	0.94
Landfill gas	SAR/kWh	0.90
Concentrated solar	SAR/kWh	2.10

- the term of the REFIT Power Purchase Agreement is to be twenty years;
- the REFIT is to be reviewed every year for the first five-year period of implementation and every three years thereafter, and the resulting tariffs will apply only to new projects;
- a reduction rate is to be excluded from REFIT;

- carbon revenue from the Clean Development Mechanism (CDM) is to be excluded from the REFIT;
- other REFIT qualifying technologies are to be considered for inclusion in six (6) months time;
- the Renewable Energy (RE) Power Purchase Agency (REPA) is to be housed in Eskom's Single Buyer Office;
- monitoring and verification is to be the responsibility of the Single Buyer Office;
- the Medium Term Power Purchase Program (MTPPP) standard Power Purchase Agreement (PPA) is to be used as a basis for the REFIT standard PPA;¹ and
- NERSA will facilitate the adoption of the PPA for REFIT purposes.

3.4 Greenhouse gas emission and energy use reporting schemes

No GHG emission and energy use reporting schemes currently exist in South Africa.

In regard to current legislation governing pollution, atmospheric emission licences, under the National Environment Management: Air Quality Act 39 of 2004 (AQA), must include GHG emission measurement and reporting requirements. However AQA does not specifically apply to CCS.

More generally, a National Energy Efficiency Campaign has been launched (GCIS, 2009).

¹ The MTPPP PPA is designed to cover a range of facility types and sizes. In brief, it envisages the sale of power by such facilities on a self dispatch basis, due to the intermittent nature of renewable energy generation. (Self-dispatch means that generators decide on the dispatch of electricity from their own generating units, in contrast to central dispatch, where the dispatch of energy is integrated across the generating units of different operators.) For an overview of the MTPPP see (Eskom 2008).

4. Existing CCS initiatives

4.1 Introduction

No integrated policy or legislation currently exists in South Africa specifically dealing with CCS. However, South Africa has been moving towards adopting a climate change policy and CCS is likely to be central to that policy.

LTMS highlighted CCS as being a potential method of CO₂ emissions mitigation. The study stated that the "largest potential reduction of industrial process emissions results from CCS from new coal-to-liquid synfuel plants". The study noted that a key constraint may be whether sufficient storage is available, but added that the mitigation potential is "still large at 851 Mt CO₂ -eq. over the period".

DEAT states, in its mitigation strategy published in July 2008, that one of its objectives is "exploring and developing CCS for coal fired power stations and all coal-to-liquid (CTL) plants, and not approving new coal fired power stations without CO₂ capture readiness."

It is clear that CCS will play a vital role in South Africa's drive to mitigate CO₂ emissions. The South African government has declared CCS to be a national research priority and this commitment is underlined by South Africa's membership of CSLF since 2003.

The recently established SANERI launched a National Centre for CCS on 27 March 2009. In addition a detailed study to identify and assess potential storage sites in South Africa is being undertaken in the form of the Carbon Geological Storage Atlas.

4.2 Acreage releases

No areas have been released specifically for CCS use. However, certain areas have been noted by DEAT as being potential sequestration sites. These include the Karoo basin, offshore Mossel Bay and the Vryheid Formation (a deep saline formation).

4.3 Government or government-business research facilities

The South African Centre for CCS was launched by SANERI in Johannesburg on 27 March 2009 (CEF, 2009). The centre will oversee the compilation of the Carbon Geological Storage Atlas and drive the CCS initiative in South Africa. The Centre is a Private/International/Public Partnership financed by local industry, government and international sources. The partners that signed the charter pledging support for the project are SANERI, Sasol, Eskom, the British High Commission, Anglo Coal, Exxaro, Xstrata Coal, Schlumberger and the Norwegian Government.

The ultimate goal of the SAR25 million (US\$3.24 million) research centre is to demonstrate CCS technology in South Africa by means of a CO₂ injection experiment (planned for 2016) and ultimately a demonstration plant by 2020. In addition, the centre will be supporting research and the creation of knowledge and skills in the fields of capture, transport and geological storage technologies, monitoring and verification, risk assessment, regulatory and policy research and public outreach and awareness. The centre is tasked with tapping into the considerable amount of expertise in South Africa in mining and mineral resources and applying it to the commercial implementation of CO₂ storage. It is also intended that the Centre will assist in facilitating a move from fossil fuels to renewable and nuclear energy.

4.4 Government funding

The South African government has provided funding for CCS related projects and research, including through SANERI, DEAT and DME. For example:

- SANERI was established by the Minister of Minerals and Energy in October 2004 as a subsidiary of CEF (Pty) Ltd, the state energy company in South Africa. SANERI is entrusted with coordinating and undertaking public interest energy research, development and demonstration. SANERI has provided funding for both the Carbon Geological Storage Atlas and the South African Centre for CCS, in addition to funding received from other parties;
- DEAT funded the LTMS, which included research into CCS; and
- in 2004, DME commissioned a preliminary report on the potential for CO₂ sequestration.

4.4.1 Mapping and data collection and sharing

An atlas of potential CO₂ underground storage sites, the Carbon Geological Storage Atlas, will be compiled as part of South Africa's plan to be using CCS technology by 2020 (CEF, 2009). The Atlas is being compiled by the Council for Geoscience and the Petroleum Agency of South Africa, with funding from SANERI and a range of energy companies including Sasol, Eskom, PetroSA and Anglo American. The Atlas is scheduled to be completed by mid-2010.

The Atlas is intended to illustrate the distribution and ranking of potential geological CO₂ storage reservoirs in South Africa, including estimated CO₂ storage capacities, the main emission sources, location of industrial hubs, transportation pipelines and other factors that may have a bearing on storage feasibility. The SAR2 million (US\$260 000) project uses current geological information to pinpoint potentially suitable underground storage sites.

In 2004, DME commissioned the Council for Scientific and Industrial Research (CSIR) to draw up a preliminary report on CO₂ sequestration. 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. CSIR's report entitled "The Potential for Sequestration of CO₂ in South Africa" indicates that sequestratable sources exist and that possible storage sites are apparent (Hietkamp et al., 2008). The report concludes that further study is required in relation to sequestration, particularly in relation to gas reservoirs and saline formations.

4.4.2 Technology demonstration and early deployment incentives

- The South African Centre for CCS is established with the aim of undertaking a CO₂ injection experiment by 2016 and, ultimately, a CCS demonstration plant being in operation by 2020.

4.5 Government-business joint ventures

LTMS was a government and business funded research study.

Both the South African Centre for CCS and the Carbon Geological Storage Atlas are jointly funded by South African government and business (as well as, in the case of the research centre, by foreign governments).

4.6 Evaluation

South Africa is yet to adopt officially integrated policy or legislation in relation to CCS. However, the South African Centre for CCS and the Carbon Geological Storage Atlas both signal South Africa's commitment to investigate the potential of CCS with a view to operating a CCS demonstration plant by 2020.

5. Capture of CO₂

5.1 Introduction

No integrated policy or legislation exists at present in relation to CCS in South Africa. Research is ongoing into the potential of CCS and the South African government has made CCS a national research priority. The South African Centre for CCS will look at a number of areas including the regulatory framework for CCS. DEAT has stated that a climate change policy will be implemented by 2010 and a legislative, regulatory and fiscal package is planned to be introduced by 2012.

There is a range of South African laws which could potentially apply to various stages of the CCS process. As these legislative instruments were not drafted with CCS specifically in mind, the extent to which they may apply to CCS is subject to conjecture. These laws may need to be adapted for them to govern CCS effectively. Alternatively, South Africa may pass integrated legislation to deal specifically with CCS.

Current South African law which may be applicable to CCS is set out below.

THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002 (MPRDA)

MPRDA deals with, inter alia, the issue of permits for the mining, exploration, prospecting and reconnaissance of minerals, and sets out the requirement for closure certificates. MPRDA is enforced by DME. MPRDA does not deal with the transportation of minerals.

It seems unlikely that CO₂ would fall within the definition of "mineral" under MPRDA, being "any substance, whether in solid, liquid or gaseous form, *occurring naturally* in or on the earth or in or under water and which was *formed by or subjected to a geological process*".

In addition the definition of "mine" refers to "any operation or activity for the purposes of *winning* any mineral. The MPRDA in its current form is therefore unlikely to cover CCS and would need to be amended should there be a desire to include CCS within its scope.

THE GAS ACT 2001

The Gas Act 2001 regulates the "transmission, storage, distribution, liquefaction or re-gasification" of gas. Under the Act, NERSA must issue licences for gas trading, operating gas transmissions, storage and distribution and the construction of gas transmission and storage facilities. The application process requires NERSA to review the plans and the ability of the applicant to comply with all applicable labour, health, safety and environmental legislation. NERSA has the power to alter the plans for any proposed construction. Failure to comply with the terms of a licence issued under the Gas Act 2001 could result in daily fines and potential revocation of the licence by NERSA.

The Gas Act 2001 therefore has the potential to govern certain aspects of the CCS process, notably transportation and storage. However, since the Gas Act 2001 defines "gas" as "all hydrocarbon gases transported by pipeline" it does not cover CO₂ in its current form and would need to be amended should there be a desire to include CCS within its scope.

THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICAN (CONSTITUTION)

Section 24 of the Constitution sets out the right to an environment that is not harmful to one's health or well-being. The Constitution also provides that the government must take reasonable legislative and other measures to prevent pollution and ecological degradation and secure ecologically sustainable development. This would cover the remit of DEAT, DME and DWAF.

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998 (NEMA)

NEMA sets out a regime for Environmental Impact Assessments (EIAs). The impacts on the environment of "listed activities" or "specified activities" must be considered, investigated, assessed and reported to the competent authority and an environmental authorisation is required. The NEMA Environmental Impact Assessment Regulations set out the application process for authorisations.

DEAT has prescribed certain activities as being "listed activities" pursuant to NEMA (section 24) and these activities therefore require authorisation. Certain aspects of the CCS process could, potentially, fall within the scope of these prescribed "listed activities".

NEMA also sets out a general duty of care to prevent pollution or degradation of the environment (NEMA, section 28). Pollution is defined as "any change in the environment caused by ... substances ... emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services ... where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future". Various stages in the CCS process could potentially lead to "pollution", as defined.

In addition, NEMA sets out a number of general principles in relation to sustainable development (e.g. the avoidance of disturbance to ecosystems, loss of biological diversity and pollution and degradation of the environment) which also have the potential to relate to CCS (NEMA, section 4).

NEMA has the potential, therefore, to be relevant to a number of stages in the CCS process.

THE NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT 39 OF 2004 (WHICH IS GRADUALLY REPLACING THE AIR POLLUTION PREVENTION ACT)

The National Environmental Management Air Quality Act (AQA) is intended to minimise air pollution. It sets out a licencing regime to control emissions. Under AQA the Minister of Environmental Affairs and Tourism must designate certain activities as "listed activities". No listed activity can be carried out without an atmospheric emission licence.

Although the CCS process is not specified as a "listed activity", the definition of "air pollution" is wide and could potentially cover the emission of CO₂, being "any change in the composition of the air caused by gases". The regime could be extended to cover CCS, as DEAT is empowered to make Regulations regarding the avoidance or reduction of harmful effects on air quality from activities not otherwise covered by AQA.

There is scope, therefore, for this Act to be applied to any process-related emissions arising from particular aspects of a CCS project.

ENVIRONMENT CONSERVATION ACT 1989

Although more relevant to storage than capture, this Act is mentioned here for completeness. Under the Environment Conservation Act 1989, "waste" means "any matter, whether gaseous, liquid or solid or any combination thereof, which is from time to time designated by the Minister by notice in the Gazette as an undesirable or superfluous by-product, emission, residue or remainder of any process or activity". Carbon dioxide captured for a CCS process could therefore be designated as "waste", meaning that a permit would be required for the operation of the "disposal" site.

NATIONAL WATER ACT 36 OF 1998

Although more relevant to storage, this Act is mentioned here for completeness. Under the National Water Act the "intentional recharging of an aquifer with any waste" is a controlled activity and requires a permit. This Act could potentially be adapted to cover the filling of saline aquifers during the CCS process.

A new Waste Management Bill is currently undergoing public and industry consultation and is expected to be implemented by 2012.

HAZARDOUS SUBSTANCES ACT 1973

The Hazardous Substances Act 1973 outlines liability associated with the handling of certain classifications of hazardous substances. Carbon dioxide is classified as a Group II substance. The Act could potentially be adapted to cover CCS.

COMMON LAW

The law of nuisance may be relevant to certain aspects of the CCS process, in the same way as it may apply to any industrial or energy-related project, if CO₂ capture is carried on in a manner which creates a nuisance.

5.2 General policy and legislation with applicability to CO₂ capture

5.2.1 Planning requirements

Carbon capture may be covered by NEMA's EIA regime. Pursuant to section 24 of NEMA, DEAT prescribed that the "construction of facilities or infrastructure" for "the refining of gas, oil and petroleum", for "the release of emissions, pollution, effluent or waste" and for "the recycling, re-use, handling, temporary storage or treatment of general waste" would constitute a "listed activity" (Regulation No. R. 387). This could possibly cover the capture of CO₂ or be extended to cover the capture of CO₂ and, if so, that activity would require an environmental authorisation.

In addition, the construction of CCS plant and infrastructure may be subject to general development planning regimes, unless South Africa adopts CCS-specific legislation which takes CCS projects out of these existing consent regimes. At present, exact planning requirements vary from province to province as the regimes are regional. For example, in the Western Cape, the Western Cape Planning and Development Act 1999 establishes a system of development planning in the province which regulates planning and development at provincial, regional and municipal levels. The Department of Environmental Affairs and Development Planning is responsible for overseeing the planning process

at provincial level. Proposed developments may be opposed by local communities during the planning process and appeals procedure.

5.2.2 Retrofitting

An EIA and environmental authorisation could potentially be required under NEMA for the capture of CO₂.

5.2.3 Relevant pollution laws and policies

The general duty of care set out in NEMA may be applicable to CO₂ capture (for example, to prevent pollution or degradation of the environment, in addition to the general principles of sustainable development).

AQA is unlikely to apply currently in relation to air pollution but could potentially be extended to cover CO₂ capture.

MPRDA and the Gas Act 2001 could potentially be extended to cover the capture of CO₂.

5.3 Liability for failure to capture

A breach of the general duty of care under section 28 of NEMA could be enforced both by DEAT and civil parties. Any environmental damage would need to be remedied. Further, potential liability could arise in connection with any failure to obtain an environmental authorisation under NEMA and for breaches of the terms of an environmental authorisation.

AQA is likely to need to be extended to CCS before liability could arise for any air pollution caused under the Act.

MPRDA and the Gas Act 2001 could potentially be extended to cover the capture of CO₂.

5.4 Evaluation

A framework is in place for the implementation of a climate change policy by 2010 and a legislative, regulatory and fiscal package by 2012 which is likely to include CO₂ capture. Current South African law could be adapted to cover the capture of CO₂. In particular the Gas Act would seem to be potentially suitable to govern CO₂ capture and transport, in addition to NEMA and AQA. However, no integrated policy or legislation currently exists in South Africa in relation to CO₂ capture and the applicability of current South African law to CO₂ capture is uncertain and fragmented.

6. Transport of CO₂

6.1 Introduction

The Gas Act 2001 has the potential to govern certain aspects of the CCS process, including transportation. The Gas Act 2001 governs the transportation of gas by pipeline and sets out licencing requirements. However the definition of "gas" would not encompass CO₂ and this Act would need to be adapted if it were to cover CCS.

MPRDA does not regulate the transportation of minerals and would also need to be substantially adapted in order to cover CO₂ transportation in connection with CCS, which would seem unlikely.

6.2 General policy and legislation

6.2.1 Planning

Infrastructure for the transportation of CO₂ could be covered by NEMA's EIA regime. DEAT has prescribed the following to be "listed activities" which therefore require an EIA and environmental authorisation:

- the "construction of facilities or infrastructure" for:
 - the "temporary storage of waste for general waste with a throughput capacity of 50 tons or more daily average measured over a period of 30 days"; and
 - the "bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic meters or more per day".

Under the Gas Act 2001, a licence is required in order to construct or operate a gas pipeline. However the Gas Act would need to be adapted in order to cover CO₂ transported in connection with CCS.

6.2.2 Access / tenure

The development and deployment of CCS activities will need to take into consideration general South African property law, which is relatively well developed. It is possible, however, that integrated legislation which is developed to facilitate CO₂ transport may adjust typical access/tenure rights, although such adjustment is likely to be without prejudice to Restitution of Land Rights Claims (if such claims are made in respect of the relevant land).²

6.2.3 Environmental and other risks

The general duty of care under section 28 of NEMA could potentially apply to the leakage of transported CO₂.

AQA could possibly be extended to cover related air pollution issues. However the transport of CO₂ is not at present a listed activity under this Act.

² Under South African law a person or community can claim restitution of a right in land if they were dispossessed of such rights on the basis of racial discrimination. There are various limitations on these claims, which concern, amongst others, the timing of the expropriation and whether just and equitable compensation was paid to the landowner at the time of their dispossession.

The Occupational Health and Safety Act 1993 sets out, inter alia, a general duty on employers to provide and maintain a working environment that is safe and without risk to the health of his employees.

6.3 Evaluation

Current South African law could potentially be adapted to cover the transportation of CO₂. The Gas Act 2001, in particular, deals with the transportation of gas by pipeline and related licencing requirements but does not currently cover CO₂. However, no integrated legislation or policy exists at present in South Africa in relation to the transport of CO₂ in connection with CCS and the applicability of current South African law to the transport of CO₂ in connection with CCS is uncertain and fragmented.

7. Exploration of potential CO₂ storage sites

7.1 Introduction

South Africa does not have integrated policy or legislation dealing with the exploration of potential CO₂ sequestration sites.

7.2 General policy and legislation

MPRDA does not apply to CCS. However MPRDA provides an exploration licencing regime in relation to minerals and it may be suitable to extend this to cover the exploration of potential CO₂ sequestration sites.

If MPRDA were to be extended to cover CCS, and this is not confirmed, an EIA and an environmental authorisation could also be required under NEMA for the exploration of potential CO₂ sequestration sites, since DEAT has designated exploration under MPRDA as a "listed activity" for the purposes of section 24 of NEMA.

7.2.1 Access / tenure

The development and deployment of CCS activities will need to take into consideration general South African property law, which is relatively well developed. It is possible, however, that integrated legislation which is developed to facilitate CO₂ sequestration exploration may adjust typical access/tenure rights, although such adjustment is likely to be without prejudice to Restitution of Land Rights Claims (if such claims are made in respect of the relevant land).³

7.2.2 Planning and construction regulation applicable to CO₂ sequestration facilities

Should MPRDA be extended to cover CCS, an EIA would need to be carried out and an environmental authorisation obtained under NEMA for the exploration of potential CO₂ sequestration sites since DEAT has designated exploration to be a "listed activity" for the purposes of section 24 of NEMA.

The Gas Act 2001 could potentially be extended to cover pipeline licencing in relation to CCS, should this be required.

Carbon dioxide is not at present designated as waste under the Environment Conservation Act 1989. If CO₂ was designated by DEAT as being waste then a permit would be required for its disposal.

7.3 Evaluation

Current South African law could be adapted to cover CO₂ sequestration exploration. The MPRDA in particular deals with exploration of minerals and related licencing requirements and could possibly be extended to cover CCS. However, no integrated legislation or policy exists at present in South Africa

³ Under South African law a person or community can claim restitution of a right in land if they were dispossessed of such rights on the basis of racial discrimination. There are various limitations on these claims, which concern, amongst others, the timing of the expropriation and whether just and equitable compensation was paid to the landowner at the time of their dispossession

in relation to the exploration of potential CO₂ sequestration sites and the applicability of current South African law to CCS is uncertain and fragmented.

8. Injection and pre-closure of CO₂ storage formations

8.1 General policy and legislation

8.1.1 Injection licencing

An EIA and environmental authorisation could possibly be required under NEMA. DEAT has designated the following to be a listed activity under NEMA: "the construction of filling stations, including associated structures and infrastructure, or any other facility for the underground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin." This could potentially apply to, or be extended to include, the injection and storage of CO₂.

MPRDA does not apply to CCS but could possibly be adapted to cover CCS and the injection of CO₂.

8.1.2 Approval processes for sequestration facility closure

MPRDA does not apply to CCS but could possibly be amended to apply to CCS. MPRDA governs the closure of facilities falling under its jurisdiction (mainly minerals-related). MPRDA sets out that the holder of a prospecting right, mining right, retention permit or mining permit remains responsible for any environmental liability, pollution or ecological degradation, and the management thereof, until the Minister has issued a closure certificate to the holder concerned. Clearly, this does not currently apply to CCS operations but there may be scope to amend this legislation to do so.

The general duty to remedy environmental damage under NEMA is also relevant to the closure of a facility.

8.1.3 Planning and construction regulation applicable to CO₂ sequestration facilities

An EIA and environmental authorisation may be required under NEMA. DEAT has designated the following to be a listed activity: "the construction of filling stations, including associated structures and infrastructure, or any other facility for the underground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin." Although clearly not directed at CO₂ sequestration, this could possibly apply, or be extended to apply, to the injection and sequestration of CO₂.

8.1.4 Leakage liability

The general duty of care under section 28 of NEMA could apply to the leakage of CO₂. Parties would be liable to remedy any environmental damage caused.

AQA could be extended to cover air pollution. However the transport of CO₂ is not at present a "listed activity".

8.2 Evaluation

Current South African law could be adapted to cover injection and pre-closure of CO₂ sequestration formations. However, no integrated legislation or policy exists at present in South Africa in relation to injection and pre-closure of CO₂ sequestration formations and the applicability of current South African law to CCS is uncertain and fragmented.

9. Post-closure and long-term storage of CO₂

9.1 General policy and legislation

9.1.1 Obligations of approval authorities

Under the Constitution the government must take reasonable legislative and other measures to, inter alia, prevent pollution and ecological degradation and secure ecologically sustainable development. This would cover the remit of DEAT, DME and DWAF.

9.1.2 Leakage liability

The general duty of care under section 28 of NEMA could apply to the leakage of stored CO₂. Parties could be liable to remedy any environmental damage caused. NEMA does not specify a limitation period.

AQA could be extended to cover air pollution. However the transport of CO₂ is not at present a "listed activity".

9.2 Evaluation

No integrated legislation or policy exists at present in South Africa in relation to post-closure and long term storage of CO₂ and the applicability of current South African law to CCS is uncertain and fragmented.

10. Summary

10.1 CCS policy and legislation 'best practice'

An integrated CCS policy is yet to be implemented in South Africa. DEAT has stated that a climate change policy will be released by the end of 2010, and a legislative, fiscal and regulatory package implemented by 2012.

10.2 Gaps in CCS policy and legislation

No current integrated CCS policy or legislation exists in South Africa. Certain laws that are currently in force in South Africa may cover certain aspects of CCS, or could possibly be extended to do so. However, the application of such laws to CCS is uncertain and untested. Alternatively, it is possible that South Africa may choose to adopt integrated policy and legislation.

10.3 Priority areas for future policy and legislative development

Further research will be required to establish a policy on CCS and to ensure that effective legislation is enacted. Indeed, the South African government has identified CCS to be a national research priority.

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