

Mining

Historically, South Africa has been a leading global supplier of minerals and mineral products, and it retains an important role in mining and minerals demonstrated by 55 minerals being produced from some 1113 mines in 2005. Mined product is sourced from open-cast, underground, alluvial, offshore, dune as well as artisanal mining. An estimated 7% direct contribution was made to GDP by mining in 2006 and R140 billion to South African exports in the same year, although when multipliers are accounted for the Gross Domestic Product contribution is closer to 40%. Efforts to address the environmental, economic, health and social impacts of mining are essential, particularly in the South African context where mining has been, and continues to be the backbone of the economy. The development of strategies and policies which enhance transparency and accountability by the mining sectors was highlighted as a key element in the JPOI targets 46 (a-c).

The Sustainability Development through Mining programme has given rise to initiatives vital to enhancing the sustainability of mining in South Africa. Initiatives introduced by the South African mining industry to improve safety in the country's mines, have resulted in a more than 50% reduction in fatalities. The mining industry has adopted a zero harm policy and wellness of employees as a top priority. Since the mid-1990s, government has sought to promote black economic empowerment in the mining industry. The process will take time, but black-owned firms are now beginning to play an important role in the mining industry, and several new mining giants have emerged. The South African Mining and Biodiversity Forum has been initiated by the Chamber of Mines of South Africa and the World Conservation Union in South Africa to improve biodiversity management practices in the mining industry. In addition, the Department of Mineral Resources has developed a Beneficiation Strategy for the South African Minerals Industry in accordance with Section 26 of the Minerals and Petroleum Resources Development Act and is aligned to broader policy objectives. The Department has initiated a Small Scale Mining Strategy.

Other noteworthy initiatives include: the South African Cyanide Guideline for Gold Mining; the International Council for Mining and Metals Resource Endowment Initiative which identifies circumstances in which positive socio-economic outcomes can flow from minerals endowments; the Responsible Jewellery Council that promotes responsible, ethical, human rights, social and environmental practices in a transparent and accountable manner throughout the gold and diamonds industries from mine to retail; the United Nations Global Compact for businesses that want to align their operations and strategies with ten universally accepted principles in the areas of human rights, labour environment and anti-corruption; and the Johannesburg Securities Exchange-Socially Responsibility Index established to aid investors to differentiate between companies based on their triple bottom line performance.

The Chamber of Mines is leading the private sectors' reporting on sustainable development. The Chamber issued a Transformation and Sustainability report for 2007/2008 that reported on progress in the mining industry with regards to sustainability issues and indicators, such as

environment, occupational health, safety, HIV/AIDs and transformation. Many private companies now issue annual sustainability reports.

There has been significant change in the mining, minerals and metals sector since the WSSD. Substantial changes to mining legislation have occurred and policies and guidelines have been developed in response to the changes in the legislation. Mining companies are taking initiative in their sustainability policies and reporting. The mining, minerals and metals industry still faces numerous challenges and targets to meet, with regards to transformation, healthy and safety and the environment.

Efforts to address the environmental, economic, health and social impacts of mining are essential, particularly in the South African context where mining has been, and continues to be the backbone of the economy. The development of strategies and policies which enhance transparency and accountability by the mining sectors was highlighted as a key element in the JPOI targets. South Africa's vision for sustainable development through mining (SDM) is encapsulated in the text contained in Box 3 below.

South Africa's sustainable development vision for mining

By 2010, the South African minerals sector is able to contribute optimally to sustainable development. This is based on the four pillars of Sustainable Development for Mining (SDM), namely:

- good governance;
- improve the health, income and living conditions of the poor majority
- accelerate economic growth with greater equity and self-reliance
- ensure equitable and sustainable use of natural resources now and into the future

The goals for SDM cover:

- achieving balanced and informed decision-making regarding abstraction and use of mineral resources
- enabling of measurement and assessment of progress towards sustainable development
- minimizing impacts and risks (including improved health and safety)
- developing tools and mechanisms for improved compliance and regulating capacity
- increasing poverty alleviation and improving growth and competitiveness so as to close the gap between first and second economies in South Africa.

Source: Drawn from the Strategic Framework for Implementing Sustainable Development in the South African Minerals Sector: Towards developing sustainable development policy and meeting reporting commitments, Discussion Document 2nd Draft (August 2009)

Thematic context

Historically, South Africa has been a leading global supplier of minerals and mineral products, and it retains an important role in mining and minerals demonstrated by 55 minerals being produced from some 1113 mines in 2005. Mined product is sourced from open-cast, underground, alluvial, offshore, dune as well as artisanal mining. An estimated 7% direct contribution was

made to GDP by mining in 2006 and R140 billion to South African exports in the same year, although when multipliers are accounted for the GDP contribution is closer to 40%. South Africa has the world's largest resources of platinum-group metals, manganese, chromium, gold and alumino-silicates. Furthermore, it accounts for over 40% of global production of the following: ferrochromium, platinum-group metals and vanadium. It is the leading producer of chrome ore, vermiculite and alumina-silicates, and is among the top three producers of gold, manganese ore, titanium minerals and fluorspar. Gold was previously the keystone to the South African economy, but has diminished in importance with increasing difficulty in mining the deep coal seams.

Off-shore mining in South Africa is also relatively productive. The near shore and shelf environments of the west coast hold rich reserves of minerals, particularly diamonds and in South Africa there is an increasing emphasis on offshore diamond mining operations. At present marine diamonds comprise about 10% of South Africa's total diamond production. The west coast also supports oil mining, although South Africa's exploration for oil is focussed on the south east coast. The Moss gas field is currently in production. For background on sustainable development as this relates to mining in South Africa, please refer to Section 2.

JPOI targets

The Johannesburg Plan of Implementation (JPOI) set three targets (46a-c) for the mining sector. These include the optimisation of social and economic benefits from mining, the effective long-term management of environmental, social and health impacts (including dealing with the legacy of old mining sites), the extension of participation in mining, the strengthening of governance and institutions, effective beneficiation and ongoing research and technological innovation.

Progress

Participation in international processes

South Africa is participating in the following processes which are relevant to the achievement of the abovementioned JPOI mining targets:

- The Intergovernmental Forum for Mining, Minerals, Metals and Sustainable Development (IGFMMMSD) which is a global policy forum seeking to promote the contribution of the sector to sustainable development, thereby enhancing capacity for overall governance. This is a partnership initiative launched at the WSSD in 2002 and meets annually to share experiences and information and to make recommendations for consideration by governments and intergovernmental bodies on mining, minerals and sustainable development issues.
- Several companies in the South African extractive sector are members of the International Council for Mining and Metals (ICMM) which is a source of guidance on industry's best practice. The ICMM adopted the Sustainable Development Framework on Mining which incorporates principles for ethical business practice, governance, sustainable development in decision-making, human rights, risk

management, health and safety, environmental performance, conservation and biodiversity management, waste recycling and disposal, social and economic development, stakeholder engagement and reporting.

- The Southern African Development Community (SADC) Mining Protocol was ratified in 2000, and further work around the Protocol has produced a framework for the Harmonisation of Mining Policies, Standards, Legislative and Regulatory Framework in Southern Africa. The framework focuses on policy, regulations and administration; geological and mining information systems; human resources and institutional capacity; safety health and environment; investment promotion; value addition, innovation and research and development; artisanal and small-scale mining, and; social issues as well as gender.
- South Africa, along with Namibia and Angola is a member of the Benguela Current Commission (BCC) which aimed at assisting South Africa, Namibia and Angola to implement an ecosystem approach to managing the Benguela marine system with particular focus to the offshore diamond mining operations.
- In 2008 South Africa participated in the technical taskforce convened by United Nations Economic Commission for Africa (ECA) to draft the new African Mining Vision. The African Mining Vision is informed by the outcomes of several initiatives and efforts made up of sub-regional, continental and global levels to formulate policy and regulatory frameworks to maximize the development outcomes of mineral resources exploitation.

Some of South Africa's bigger mining groups have begun to adopt International Performance standards and benchmarks for their own policy and practice in line with international good practice.

Developments in national policy and legislative framework

Section 1 of the report provides an overview of legislation relevant to all aspects of sustainable development in South Africa. An overview of the policy and legislation as this relates to the sustainability and mining in South Africa is provided in this section.

Policy and legislation for sustainability in mining

A key advancement towards a policy shift in the direction of sustainable development was made following the WSSD. An interrelated shift in South African Mineral law over the last decade has been the recognition of the State as the custodian of the natural resource of the country has brought South Africa in line with other major mineral producing countries in the world and had resulted in the freeing up of unused and privately owned mineral rights which were effectively sterilized.

In 1995, a review of the mining and minerals policy was initiated and was a consultative process, involving representatives from government, business, small-mining sector, labour groups,

communities and environmental groups. This review of the legislation culminated in the promulgation of the Minerals and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA). Promulgated in 2002, the MPRDA provides a sound base for South Africa's response to the JPOI targets set for mining by addressing transformation, workers and community rights, economic sustainability of the industry and environmental sustainability. The MPRDA aims to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources, hence ensuring that the exploitation of mineral wealth of South Africa takes into consideration the economics, environmental issues as well as the social matters into consideration.

In response to and accordance with the MPRDA, Regulations have been expanded on and developed into the following policies and guidelines. The *Mining Charter* which is a Broad-Based Socio-Economic Empowerment Charter provides a framework for progressing the empowerment of historically disadvantaged South Africans in the Mining and Minerals Industry in accordance with Section 100 (2)(a) of the MPRDA. The Scorecard for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry was designed to facilitate the application of the Charter. In addition to the MPRDA, the Mine Health and Safety Act 29 of 1996 promotes rigid health and safety standards in the mining sector.

The MPRDA aims to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Transformation of the minerals and mining industry and promotion of equitable access to South Africa's mineral resources is a key focus of the sector and is achieved through socio-economic development and commitment to eradicating all forms of discriminatory practices in the mineral and petroleum industries. Worker and community rights and well-being have been strongly promoted, including through regulations for housing and living conditions. This is closely tied with the need to promote local and rural development and the social upliftment of communities. Social and labour plans have to be submitted as part of the mining rights application, the objectives of which are to promote employment and advance the social and economic welfare of all South Africans.

Economic sustainability of the industry has been promoted through identification of the need for investment in exploration, mining and minerals beneficiation and there is reaffirmation of the State's commitment to guaranteeing security of tenure in respect to prospecting and mining operations. Environmental sustainability of the mining industry has been promoted as this relates to legislation including the overarching. Further, it is confirmed that it is the State's obligation to protect the environment to ensure ecologically sustainable development of resources and to promote social and economic development

The MPRDA sets out the time periods and processes relevant to each category of used and unused old order rights for the conversion of such rights to new order rights. The Act was amended in 2007 with the Minerals and Petroleum resources Amendment Bill (B10, 2007) primarily to harmonise the environmental impact assessment requirements of the National

Environmental Management Act, 1998 and to amend the transition arrangements to further afford statutory protection to certain existing old order rights.

Beneficiation Policies

The Department of Minerals Resources (DMR) published “*A Beneficiation Strategy for South Africa’s Minerals Industry*” which presents a framework within which South Africa can implement an orderly development of the countries mineral value chains, to support national programmes such as the National Industrial Policy Framework (NPIF).

There are a number of other legislation that have relevance to beneficiation. The *Diamonds Act 56 of 1986* was amended in the form of the *Diamonds Amendment Act 29 of 2005* and the *Diamonds Second Amendment Act. 30 of 2005*. The objective of the Amendment are to increase the access to rough diamonds for jewellery making in South Africa; to maintain a supply of rough diamonds to promote the beneficiation industry in South Africa, thus creating jobs; and to increase participation through the diamond value chain. The *Precious Metals Act 37 of 2005* was promulgated to ensure that the precious metal resources of South Africa are exploited and developed in the best interests of the people of the country, to promote equitable access to and local beneficiation of the precious metals, to promote the sound development of precious metals enterprises and to advance the objectives of BBSEE.

South Africa has a natural advantage in mineral deposits such as gold, PGM, manganese, chromium, vanadium, copper, antimony, phosphate rock, uranium, fluorspar and titanium containing heavy minerals; yet most of these are exported in an un-beneficiated form. The unique process developed by Sasol, based upon the “Fischer Tropsch” technology, results in abundant quantities of propylene. This is converted to primary polypropylene, destined primarily for exports in un-beneficiated form. There are substantial beneficiation opportunities to transform the raw material using local factors (labour and capital) to a more finished product that has a higher value than the sale of the raw material. There are also further potential to recover chemicals from waste products such as copper and aluminium scrap.

Health and Safety Policies

Prior to 1996, health and safety were regulated under the Minerals Act 50 of 1991. In 1996, the *Mine Health and Safety Act 29 of 1996* replaced this in order to promote more rigid health and safety standards in the mining sector. The *Mine Health and Safety Amendment Act* was assented to in April 2009 and came into operation on 30 May 2009. Key Amendment to the Act include the need for training records to be kept; employer investigations to be initiated within 10 days of the incident and a report submitted to the inspectorate within 30 days; permanent committees of the Mining Health and Safety Committees (MHSC); Health and Safety management systems to be in place; administrative fines increased from R200 000-R1million; and offences-applicable to the Employer.

Mine Environmental Management Policies

Environmental Management issues in the mining sector of South Africa are regulated by the Department of Minerals and Energy through the legislation called Minerals and Petroleum Resources Act (MPRDA) of 2002. This piece of legislation was promulgated in 2002, and effective for implementation in 2004. The MPRDA and its regulations marked a shift in the consciousness about the environmental impact management for mining activities as well ensuring that there is a holistic approach towards mine environmental management adopting the cradle-to-grave approach in prospecting and mining activities whilst ensuring a full internalisation of economic, social and environmental costs in order to achieve sustainable development of South Africa's mineral resources.

Through the enforcement of the environmental requirements in terms of the MPRDA, there has been a significant progress in terms of ensuring best environmental best practices in the mining industry, and also in terms of making sure that the mining industry moves towards achieving environmental sustainability. The mining companies are obliged in terms of the MPRDA to comply with the following:

- Implement the principles of sustainable development as set out in sections 2 of the National Environmental Management Act, (NEMA) 1998, as well as other generally accepted principles of sustainable development by integrating social, economic and environmental factors into planning, implementation, closure and post-closure management of prospecting and mining operations.
- Implement the integrated environmental management and responsibility to remedy as laid down in chapter 5 of NEMA.
- Conduct an environmental impact assessment and submit an environmental management programme, in order for the applicant to identify, mitigate and manage the environmental impacts emanating from prospecting or mining activities.
- Conduct consultation with interested and affected parties as well as consultation with government departments and organs of State at national, provincial and local authority level.
- Make sufficient financial provision for the rehabilitation, remediation for environmental damage and management of negative environmental impacts. The MPRDA regulations prescribe the methods for financial provision and the detailed itemisation of all costs.
- Planning for Mine Closure to ensure environment, social and economic sustainability beyond the life of the mine. Moreover, conduct environmental risk assessment and adopt closure planning approach as an activity that continues

throughout the life cycle of a mine, starting with conceptual closure plans prior to production, periodic updates throughout the life of the mine, and a final decommissioning plan.

Minerals and Petroleum Resources Development Act Regulations were promulgated in order to prescribe and provide guidance in terms of the fulfilling the above requirements of the Act. Moreover, the Department of Minerals and Energy has also made strides in terms of developing the best environmental practices guidelines which strengthens the enforcement of the legislation, with a view to ensure environmental stewardship in the mining sector. This includes, amongst others, the guideline document for the evaluation of the quantum of closure-related financial provision provided by a mine for environmental rehabilitation and closure requirements of mining operations the Department of Minerals Energy has published a guide on

Over and above the MPRDA, there are other overarching legislations that governs the mining sector in South Africa, and this include the following;

The *National Environmental Management Act (NEMA 107 of 1998)* and Environmental Impact Assessment (EIA) Regulations which set out lists of identified activities which require basic assessment procedures and scoping and full EIA procedures respectively are pertinent to many of the ancillary activities associated with mining.

The *National Environmental Management: Air Quality Act (NEM: AQA, Act 39 of 2004)* came into effect in September 2005. All water uses on mines must be licensed under the *National Water Act (NWA, Act 36 of 1998)* which serves to ensure that the Nation's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner. The NEM:WA was assented to in March 2009.

New and existing mining operations are required to consider South Africa's comprehensive range of legislation applying the social and economic sustainability of the operation including: conservation of agricultural resources; the interim protection and restitution of land rights to those dispossessed of their land; informal as well as communal land rights; the preferential procurement framework; employment equity and skills development as well as legislation applying to competition.

Guidelines

A comprehensive series of guidelines has been produced by organisations including the Chamber of Mines and Coaltech as well as the DMR. These covers key areas essential for implementation of sustainable development though mining including: South Africa's biodiversity status as well as best practice in relation to mining; best practice guidelines for water resource protection, impact assessment on mining developments; the quantum of closure-related financial provision provided by a mine; possible financial sources for small to junior empowerment companies.

Standards

ISO 26000 is a guideline setting out Principles on Social Responsibility which most of the country's mining houses practices. According to the new work item proposal the standard should

assist organisations in addressing their sustainability reporting while respecting cultural, societal, environmental and legal differences and economic development conditions, as well as providing practical guidance related to social responsibility.

Development of administrative structures

Although the DMR is the approval authority, other government departments must be consulted and these departments may enforce acts that provide for the protection of specific environments or require environmental impact assessments. Currently the DMR remains the lead authority for environmental authorisations under the MPRDA, however ancillary activities associated with mining operations are required to be licensed under from other departments. The minister of the DMR will remain the designated competent authority to implement systems related to mining, while the minister of DEA will be the appeal authority for the mining environmental management process. Water uses on mines must be licensed under the NWA for which the lead authority is the DWA.

Actions in response to international and local policy

Integration of sustainability into mining

The Sustainable Development in Mining (SDM) programme has given rise to initiatives vital to enhancing the sustainability of mining in South Africa. See Section 4.5 which showcases the progress which is being made in terms of this programme with respect to closure of derelict mines.

Mine health and safety

South Africa has made progress with the reduction of the number of mine fatalities, but there is some concerns with mining industry roleplayers and authorities regarding the implementation of the Mine Health and Safety Act (MHSA) Amendment Bill, as this is seen to be economically unsustainable by mining representatives, while union representatives see the Bill as a viable and necessary promotion of the safety of workers. Initiatives introduced by the South African mining industry to improve safety in the country's mines, have resulted in a more than 50% reduction in fatalities. A commitment was made to achieve the occupational health and safety targets of zero fatalities. The result of the commitment made to health and safety were a 50 % per annum reductions in the Fatality Frequency Rates (FFR) from 2006 to 2008. Furthermore, silicosis, noise induced hearing loss, tuberculosis and HIV/AIDS are high on the mining industry's agenda with regard to occupational health and sustainable development. Industry targets have been set for the elimination of silicosis and noise induced hearing loss by 2013. The mining industry has adopted a zero harm policy and wellness of the employees as a top priority. In 2008, labour, government and industry developed a Tripartite Leadership Action Plan to achieve the commitment made in 2003. In the action plan, stakeholders commit to strengthen the culture of health and safety, build capacity, promote adoption of leading practices and improve research and development in health and safety.

Transformation

Since the mid-1990s, the government has sought to promote black economic empowerment (BEE) in and through the mining industry which provides a framework for progressing the empowerment of historically disadvantaged South Africans in the Mining and Minerals Industry in accordance with Section 100 (2)(a) of the MPRDA. The process will take time, but black-owned firms are now beginning to play an important role in the mining industry, and several new mining giants have emerged. The Broad-Based Socio-Economic Empowerment Charter (BBSEE) Charter for the South African mining industry has been developed to establish a framework for effecting the introduction of historically disadvantaged South Africans into the mining Industry.

Social and Labour Plans

In order to ensure effective transformation for the mining and production industry, the Social and Labour Plan has been regarded as a prerequisite for the granting of mining or production rights. The MPRD Act requires that any company that wishes to mine to have put in place Social and Labour Plan in order to get official permission to do so. The Social and Labour Plan requires applicants for mining and production rights to develop and implement comprehensive Human Resources Development Programmes including Employment Equity Plans, Local Economic Development Programmes and processes to save jobs and manage downscaling and/or closure. The above programmes are aimed at promoting employment and advancement of the social and economic welfare of all South Africans whilst ensuring economic growth and socio-economic development. To this effect the Department deemed it appropriate to provide guidelines for the development of the Social and Labour Plan in tandem with the objectives of the MPRDA and the National Social Plan.

Framework for Sustainable Development in Mining

The DMR, in response to the WSSD commenced with the development of a strategic framework for implementing sustainable development in the South African Minerals sector, focusing on developing sustainable development policy and meeting reporting commitments. The framework aims at; developing a common vision for sustainable development through mining among stakeholders; identifying and prioritize derelict and ownerless mines for rehabilitation as well as facilitating capacity building, community projects as well as the promotion of women in mining.

Small-scale mining

Government is striving to legalise the current small scale mining operations and to assist in making them economically viable in such a way that is relevant, understandable and affordable to the small scale miners. The government has established the Small Scale Mining administrative structure and a Small-Scale Mining Board to develop and address the challenges faced by the small scale mining sector. The structure focuses in providing aid to small scale miners with legal requirements, provide guidance towards the identification of mineral deposits, compliance with environmental requirements, as well as provide assistance with mining feasibility and market assessment. Up to November 2008, 38 small scale mining companies were fully operational and it

is expected that for the 2009/10 financial year an additional 17 new small scale mining projects will be added to the operational projects.

Mine Rehabilitation

The DMR in co-operation with the Council for Geoscience have further undertaken the development of a National Strategy for the management of derelict and ownerless (DO) mines. The strategy includes the following components: the development of a national database of derelict and ownerless mines which is now complete; ranking of the mines in terms of their potential impact, which is an ongoing process; the implementation of a programme to address the impacts of the derelict and ownerless mines needs to be instituted. On a smaller scale, such as sealing localised shafts and remediation of mine residue deposits can be carried out in a short space of time and with the involvement of local contractors and communities. On a larger scale, regional impacts with a longer duration require research and development into more complex technologies. These projects will require significant funding and are likely to require long-term monitoring to ensure sustainability.

Monitoring and evaluation

The Chamber of Mines issued a Transformation and Sustainability report for 2007/2008 that reported on progress in the mining industry with regards to sustainability issues and indicators, such as environment, occupational health, safety, HIV/AIDs, cooperate governance, corporate social investment, waste and transformation. Many private companies now issue annual sustainability reports. These companies include Anglo American, BHP Billiton, Goldfields, Lonmin, Rio Tinto, Exxaro, Harmony and Implats. Targets set by the Mine Health and Safety Council for occupational health include occupational health limit for respirable crystalline silica, protection of hearing and prevention of silicosis.

The COM produced a sustainability report for 2006 and it addressed the progress against government and industry targets in various areas on mining sector activity. The table below summarises some of the key performance indicators:

Performance of the mining industry according to selected indicators

Indicator	Objective	Progress	
		2005	2006
Women in mining	10% by 2009	3.5%	4.1%
HDSA in mining	40% by 2009		28%
Adult education and training	6869 per annum	1530	3361
Learnerships	800 per annum	1078	1137
Energy efficiency	15% reduction 2004-2014	Not available	Not available
Dust samples > limit (%)	<5% by 2008	6.4%	6%
HIV+ employees on wellness programme	100% by 2011	29%	32%
Fatality frequency rate (% reduction since 2003)	20% reduction per annum	13%	12%

A CSIR study of the ecological status of rivers and wetlands in the Waterberg aims to minimize the potentially adverse consequences of new power stations and mining in the area. This will be the first study of its kind conducted prior to the establishment of large infrastructural developments such as the Medupi power plant, which is being built close to Lephalala in the fish and invertebrates.

A series of bio-indicators has been identified and baseline studies conducted which can be used to monitor pollution from mining including phytoplankton, benthic algae, macro-invertebrates and fish radioisotope studies can be done to determine accumulation of heavy metals in fish and invertebrates.

Means of implementation

Capacity-building, education, training and awareness-raising

There has been an increase from 3.7% to 4.5% of payroll spent on training each year, which exceeds the international benchmark of 3% of payroll. This expenditure excludes social responsibility spending on education and training. Capacity-building and training initiatives relevant to the JPOI targets include:

- Mining industry collaboration with structures such as the Joint Initiative for Priority Skills Acquisition (JIPSA) and the Mining Education Trust Fund (METF) to promote skills development and the training of learners, artisans and ensuring a sustainable supply of engineers. The METF contributes on average R8 million per annum.
- National Skills Development Strategy (NSDS) and the extent to which the targets of the NSDS are met through the Mining Qualifications Authority. Furthermore, encouragement of participation of mine staff in Adult Basic Education and Training programmes in the mining sector is promoted.
- Mintek was appointed by the Department of Labour as an Employment and Skills Development Agency and the offer training services within the mining sector.

DST has proposed the development of a national research institute focused on high level beneficiation skills and technology, and will operate as a virtual institute and be a collaborative effort between universities, other research foundations and the private sector on mining and minerals issues.

Mobilisation of finance

The Nedcor Securities Junior Mining and Exploration Index (NSJME) is an investment vehicle that provides exposure for South Africa's Junior Mining and exploration sector. It has shown continued growth in the market capitalisation of the junior mining and exploration sector, which

exceeded R120 billion in 2007. Furthermore, the METF contributes on average R8 million per annum for skills development and training in the mining sector.

Technology development, transfer and dissemination

The Advanced Metals Initiative (AMI) was established by the DST and is implemented by the CSIR, Mintek and Nuclear Energy Corporation of South Africa (NECSA). The purpose of the AMI is to research, develop and innovate across the advanced metals value chain, whilst reducing the energy requirements of producing metals, increasing asset productivity, developing low-cost manufacturing technologies and reducing the environmental impact of the full life cycle. Three technology networks exist within the AMI, namely: the Light Metals Development Network which focuses on lighter functional alloy materials for the automotive and aerospace industries; the Precious Metals Development Network which focuses on the value addition of platinum group metals; and the New Metals Development Network that focuses on the beneficiation of nuclear materials for use in nuclear reactors.

Participation of major groups

Initiatives to strengthen small miners have included the South African Mining Development Association (SAMDA) set up by junior and BEE mining companies and the South African Small-Scale Mining Chamber established by government. The objectives of the Mining Charter are as follows: to promote equitable access to the nation's mineral resources to all the people of South Africa; to substantially and meaningfully expand communities for HDSA's, including women, to enter the mining and minerals industry and benefit from its activities; to advance employment and social and economic welfare of mining communities and major labour sending areas; and to promote beneficiation of the South Africa's mineral commodities.

There has been increased emphasis in the involvement of local communities and in particular women in decision-making and implementation in the mining and minerals sector due to the requirement of the MPRDA and Mining Charter. Section 56 of the Regulations GN R385 under NEMA has increased requirements for public participation during the environmental impact assessment process in comparison to previous legislation. The MPRDA also provides for consultation with interested and affected parties during the impact assessment process. Increasingly, the issues of communities surrounding mining projects are influencing the mine development and planning process.

Cooperative frameworks and partnerships

Following the WSSD in 2002, DMR established a multi-faceted programme called Sustainable Development through Mining. The programme has been fully operational for two years. It embraces international and national policies and initiatives relating to sustainable development in mining, including the JPOI targets. Active sub-programmes include: Sustainable Development Strategy; Human Resources and Skills Development; Derelict and Ownerless Mines Rehabilitation; and Enforcement and Compliance.

The Chamber of Mines is the key engagement mechanism between the public and private sectors in mining and has been instrumental in steering the private sectors sustainability journey. The Chamber has continued to play a key role as an organisation representing mining employers.

The South African Mining and Biodiversity Forum provide an opportunity for cross-sectoral interaction and co-operation with the aim of improving biodiversity conservation and performance in alignment with international best practice.

South African Mining Development Association (SAMDA) was initiated in 2000 as the Junior Mining Initiative by a group of people associated with junior mining and empowerment mining companies with the intention of creating an enabling environment for capital raising, skills development, practising responsible environmental management and sustainable development and the maintenance of standards of good practice.

Sectorally based organisations include the SAMDA, the Aluminium Federation of South Africa, the South African Copper Development Association, the Engineering Industries Federation of South Africa, the South African Stainless Steel Development Association, the Aggregate and Sand Producers Association of South Africa and the Small Scale Mining Board.

Lessons learned and best practices

Sustainable mining practice

The SDM project is a key first step forward towards implementing sustainable mining for South Africa. The document summarizes a platform structure to pursue sustainable development. The vital role of partnerships with industry and stakeholder representatives is seen as central to the approach of sustainable mining. The document articulates a vision (see Section 4.1) and a number of goals for sustainable mining, including the way these link to other programmes such as the NFSD. The goals include: achieving balanced and informed decision-making regarding abstraction and use of mineral resources; enabling of measurement and assessment of progress towards sustainable development; minimizing impacts and risks (including improved health and safety); developing tools and mechanisms for improved compliance and regulating capacity; increasing poverty alleviation and improving growth and competitiveness so as to close the gap between first and second economies in South Africa. The SDM process is consultative and is being developed through an iterative process.

Closure of unsafe mines

Unsafe mine openings, rehabilitation of old mined areas and prevention of water ingress into derelict mines is being undertaken through two programmes run in partnership between the DMR and the Council for Geoscience.

Rewarding of best mine practice

In recent years, many mining houses have received awards in recognition of their contribution towards sustainable development. The following rewards were received: Green Mining Award for

Sustainability, South African National Productivity Improvement Award, Businessmap/Business Report, Global Business Coalition Commendation for excellence in HIV/AIDS Counselling and Green Mining Socio economic Award. The aforementioned award system promotes the incorporation and practice of the three dimension of sustainable development in the mining sector.

Royal Bafokeng Holdings (Pty) Limited

Land where the Royal Bafokeng tribe reside is rich in minerals ranging from asbestos to vanadium, the most important of which is platinum. Mining companies may utilise the underground rights of the land, but the surface rights belong to the Bafokeng. The mines have to pay royalties to the tribe and provide job opportunities. Royal Bafokeng Holdings (Pty) Limited (RBH) is responsible for the management and development of the commercial assets of the Royal Bafokeng Nation, with the overall business objective of maximising returns to enable the RBN to deliver sustainable benefits to the community.

Emalahleni Water Treatment Plant

A joint venture between Anglo Coal South Africa and BHP Billiton Energy Coal South Africa (BECSA) that treats 23 megalitres of mine water from three operational coal mines and one defunct coal mine. Eighteen megalitres is pumped to the Emalahleni municipality constituting 20% of their daily water requirements and of the remaining water, some is pumped to surrounding mines for use in mining activities and coal processing, alleviating the demand on the municipality and a small proportion is bottled by an empowerment company for the local bottled water market. The construction of the plant created 650 – 700 temporary jobs and the operation of the plant has created 40 permanent jobs, 91% of which are people from the local area. The plant aims to be a zero waste facility, with significant investment being made into research and development projects focuses on 100% use of the by-products from the treatment plant.

The Plant won two categories of the *Mail & Guardian's* Greening the Future Awards (Innovative environmental strategies that improve business performance and Water care) and the sustainability category of Nedbank Capital's Green Mining Awards.

Anglo Coal Isibonello Wetland Offset

Wetlands are a key resource for the maintenance of stream flows and water quality, and they are afforded protection in South Africa through the NWA and regulatory framework. Thus protection of wetlands needs to remain a high priority, and the precedent for destruction of wetlands needs to be avoided. However, offset projects can be considered as one means of reducing the ecological footprint of mining developments. The first wetland offset project in South Africa is the Isibonello Colliery, an Anglo Coal opencast coal mining operation in the Upper Olifants River Catchment in Mpumalanga. Anglo Coal recognised that part of the Steenkoolspruit wetland would be destroyed by the mining operations. As such, Anglo Coal worked in collaboration with DWA, DEA, Mpumalanga Parks Board, the Mondi Working for Wetlands Project and specialists from Wetland Consulting Services to rehabilitate a wetland of similar function and scale in another part of the Upper Olifants River Catchment as a mitigation measure for the destruction of part of the Steenkoolspruit wetland.

Ongoing monitoring of the wetland rehabilitation and its effect on the surrounding wetlands continues and Anglo Coal has committed to the ongoing maintenance of these sites.

Challenges and opportunities

South Africa has one of the most competitive economies on the continent of Africa, but it still has to overcome many obstacles in order to be competitive on a global scale. The country ranks among the top five countries in Africa on the basis of comparisons of government competence, quality of public institutions and respect for contract law, and access to technology.

Occupational health

The high incidence of Tuberculosis in the mining industry is linked to the HIV/AIDS epidemic and the incidence of silicosis. The Tuberculosis programme launched by the mining industry in South Africa surpasses the World Health Organisation best practice in many aspects, however, the rates of Tuberculosis infection remains high.

HIV/AIDS in South Africa is now both a health and development crisis. Over 5 million people in the country are HIV positive, approximately 1 000 people die of AIDS-related illnesses on a daily basis and about 500 000 people are infected annually. The implications of this are far reaching, affecting loss of life, productivity, education, skill and training and increased pressure on health care facilities, orphanages and funeral homes. A challenge with regards to noise induced hearing loss and silicosis is that these risks are measured in terms of lag indicators, i.e. indicators that show the incidence after exposure to the risk. Measurable lead indicators have been developed. The COM committed R 42 million over 6 years and is implementing a tripartite project which aims to improve access to compensation for occupational diseases for ex mine workers.

Enhancing competitiveness during the financial downturn

Enhancing competitiveness during the financial downturn

The 2008/2009 international economic downturn as well as the local inflationary pressures resulting from higher oil prices and higher food prices has pulled the market into a recession. The severity of the recession as the demand for and prices of commodities drop will determine sector shrinkage in terms of job and revenue loss.

Cost-effective technology for deep-lying deposits

The relative contribution to the South African economy from mining of ore has declined since the 1980's due to increasing difficulty in accessing the deep-lying ore deposits. Advances in technologies to ensure cost-effective mining which is at the same time socially and environmentally sustainable remains a challenge for the country.

Broadening the transformation agenda

Transformation in South Africa is a key challenge with many associated opportunities. In the minerals sector, the MPRDA which includes a requirement for social and labour plans and the Mining Charter provide the basis on which transformation is occurring.

Water

South Africa represents a critical resource for a wide range of minerals that drive the world economy. The country has a long history of mining and has limited natural water resources, leading to a situation where it also has a number of significant mine-water related challenges. Acid Mine Drainage (AMD) is a one of the challenges in this theme.

Retaining the focus on legacy issues

The legacy of derelict and ownerless mines that have not been rehabilitated and for which, historically, no financial provision was made. These mines, in terms of section 46(1) of the MPRDA may become the responsibility of the DMR. The challenge of derelict and ownerless mines in South Africa has repercussions for surface and groundwater contamination; air pollution from windblown dust and spontaneous combustion in the case of coal mines; and health and safety issues where shafts have not been sealed or slopes on dumps are not stable, open pits have not been rehabilitated and features and abandoned mine infrastructure have collapsed. The roll-out of the National Strategy for the Management of Derelict and Ownerless Mines in South Africa plays a critical role in addressing these challenges.

Maintaining a role in the climate change agenda

South Africa is dependent on coal for energy. Ninety three percent of the electricity produced in South Africa is from coal mined locally, with 43.7 million tons of coal being used for the manufacture of synthetic fuels - accounting for about 37% of the liquid fuel production in the country. The implication of proposed carbon taxes on the cost of electricity has far reaching implications for the minerals industry, particularly with regards to energy intensive mineral beneficiation. The South African National Energy Research Initiative has been instrumental in driving research into carbon capture and storage.

Expanding and entrenching good governance in mining

It is important that mining imperatives be integrated with regional and local community needs. For example, the integration of social and labour plans with municipal Integrated Development Plans (IDPs), Spatial Development Frameworks and Local Economic Development Plans (LEDs) is very important. The Extractive Industries Transparency Initiative is an initiative that aims to strengthen governance by improving transparency and accountability.

Mine fatalities

South Africa has made strong progress with the reduction of the number of mine fatalities, but there is some tension between mining industry roleplayers and authorities regarding the implementation of the MHSA Amendment Bill, as this is seen to be economically unsustainable by mining representatives, while union representatives see the Bill as a viable and necessary promotion of the safety of workers.

Mine Closure

Although mine closure is well regulated and documented, there have not as yet been any mine closures achieved in South Africa. This relates to insufficient finance and forward planning to

ensure setting aside of finances and plans to cover the costs and other requirements of closure. Further, the sustainability of practices after mines cease operation is of major concern. Communities which have become dependent on the operational mines have been left without economic and livelihood opportunities after the mine cease operation. Methods exist to rehabilitate the surface and ameliorate pollution post-mining, however the long term success of these methods is dependent on the post-mining land use. Regional closure strategies need to provide a framework in which mines can develop closure plans that address broader development priorities, as well as possible cumulative impacts of the activities of a number of mines taking into consideration socio-economic and environmental issues on a regional basis. Factors which will be key to the success of a regional closure strategy are buy-in from stakeholders, trade-offs, stakeholder engagement, setting-up of completion criteria (balanced scorecard for regional mine closure), targeted research and data management

Infrastructure

The new challenge for South Africa when doing trading especially when exporting raw material will be to provide an adequate level of infrastructure investment while boosting the level of private investment. The country has major infrastructure problems in its ports and railway system which inhibit the export of commodities such as coal. Private investment also suffered during the early years of the country's political transition given uncertainty about how the new government would approach economic development. As the government's macroeconomic policy has been responsible, South Africa's credit ratings have improved and there is a higher level of business confidence in the economy than ever before.

Illegal mining

Illegal mining, particularly in abandoned and derelict mines, is of concern in South Africa. Amongst the problems are the numerous health and safety risks for the miners, caused by factors such as rock falls, suffocation, fire risks and carbon monoxide poisoning. Illegal mining is a relatively widespread problem in the country although insufficient data is available to assess the full extent of this problem. There are indications that some of the illegal mining is driven by organized crime syndicates.

Conclusion

There has been significant change in the mining, minerals and metals sector since the WSSD and establishment of the JPOI targets. Substantial changes to mining legislation have occurred and policies and guidelines have been developed in response to the changes in the legislation. Mining companies are taking initiative in their sustainability policies and reporting. The mining, minerals and metals industry still faces numerous challenges and targets to meet, with regards to transformation, health and safety and the environment.