OFFICIAL GUIDE TO South Africa 2020/21

MINERAL RESOURCES AND ENERGY

The Department of Mineral Resources and Energy (DMRE) is mandated to ensure the transparent and efficient regulation of South Africa's mineral resources and minerals industry, and the secure and sustainable provision of energy in support of socioeconomic development.

The DMRE will continue to focus on transforming mining and energy resources, rehabilitating mines and the environment, extending access to electricity, enhancing energy efficiency, and managing nuclear energy in accordance with international commitments.

The department's labour-intensive work requires inspections to ensure that mining companies comply with legislative requirements, and for electricity connections through the integrated national electrification programme to be verified.

Transforming mining and energy resources

As the department seeks to accelerate transformation within the mining and energy sectors, it aims to monitor and enforce compliance with the Mining Charter.

This is expected to be done by conducting social and labour plan verification inspections, and economic verification audits on mines. The DMRE will continue to enforce compliance with regulatory standards and transformation objectives in the petroleum sector by inspecting targeted petroleum retail sites and issuing mining rights or permits to a targeted historically disadvantaged South Africans over the period ahead.

Rehabilitating mines and the environment

To promote the health and safety of mine employees and people in surrounding communities, the department will continue to rehabilitate dangerous, derelict and ownerless mining sites.

Extending access to electricity

Over the period ahead, the department is expected to enable over 600 000 households to be connected to the grid and 45 000 households to be connected through non-grid technology. The bulk of these households are in sparsely populated rural areas (mostly in KwaZulu-Natal, Eastern Cape and Limpopo) and high-density informal settlements.

Extending access to electricity

To realise a target of 1.5 terawatt hours of energy savings over the medium term, municipalities are expected to undertake initiatives to upgrade municipal infrastructure that is not energy efficient, such as replacing street and traffic lights with greener technology.

Role players:

- **Mine Health and Safety Council:** It was established in terms of the Mine Health and Safety Act of 1996, and is listed as a schedule 3A public entity in terms of the Public Finance Management Act (PFMA) of 1999. It is mandated to advise the Minister of Mineral Resources and Energy on occupational health and safety at mines, develop legislation, conduct research, and liaise with other statutory bodies.

  The council was expected to continue focusing on improving the safety of mineworkers by offering programmes to promote safety awareness, and improve occupational health and safety for workers.
- **Council for Mineral Technology Research (Mintek):** Mintek's mandate, as set out in the Mineral Technology Act of 1989, is to maximise the value derived from South Africa's mineral resources through, among other things, research and development, technology transfer, and the creation of an enabling environment for the establishment and expansion of mineral industries. To this end, Mintek develops appropriate, innovative technology for transfer to industry, and provides the industry with test work, consultancy, analytical and mineralogical services.

  Over the medium term, Mintek aimed to focus on developing technical solutions through research and development and innovation that can be transferred to the minerals sector in support of the development and expansion of South African minerals-based industries.
- **Council for Geoscience (CGS):** The CGS was established in terms of the Geoscience Act of 1993 to promote the search for and exploitation of any mineral in South Africa. It is mandated to generate, compile, curate and publish world-class geoscience knowledge products, provide geoscience-related services to the South African public and industry, and render advisory services related to geohazards and geo-environmental pollution.

  Over the medium term, the council aimed to continue focusing on the geoscience national mapping programme, the data migration and digitisation programme, the procurement of key geoscientific equipment and infrastructure, and the improvement of high-quality research and analysis.
- **South African State Diamond and Precious Minerals Regulator (SADPMR):** The SADPMR was established to administer the Diamonds Act of 1986 (as amended) and the Precious Metals Act of 2005.

  The Diamond Exchange and Export Centre (DEEC) was established by the SADPMR in terms of Section 59(b) of the Diamonds Second Amendment Act of 2005 and started operating on 14 January 2008. One of the core functions of the SADPMR is to facilitate the buying, selling, exporting and importing of diamonds through its DEEC, which is a secure and controlled environment where goods are offered to other licensees.

It plays a vital role in ensuring that unpolished diamond tenders are facilitated fairly to the local market.

- **State Diamond Trader (SDT):** The mandate of the SDT, as defined in the Diamonds Amendment Act of 2005, is to buy and sell rough diamonds, and to promote equitable access to and beneficiation of the country's diamond resources. It is listed as a schedule 3B public entity in terms of the PFMA of 1999.

  The trader is mandated to conduct research, develop a client base, contribute to the growth of the local diamond beneficiation industry, and develop efficient means of marketing diamonds not suitable for local beneficiation. Over the medium term, the trader aimed to continue growing the local diamond beneficiation industry and increase the sale of rough diamonds to historically disadvantaged South Africans. The trader generates revenue from the sale of rough diamonds.
- **Sasol:** The international integrated chemicals and energy company develops and commercialises technologies, and builds and operates world-scale facilities to produce a range of high-value product streams, including liquid fuels, chemicals and low-carbon electricity.
- **Eskom:** Its generates about 95% of the electricity used in South Africa and about 45% of the electricity used in Africa. It generates, transmits and distributes electricity to industrial, mining, commercial, agricultural and residential customers.
- **iGas:** It is the official state agency for the development of the hydrocarbon gas industry in southern Africa.
- **Petroleum Agency South Africa (PASA):** It promotes exploration for onshore and offshore oil and gas resources, and their optimal development.
- **Petronet:** It owns, operates, manages and maintains a network of 3 000 km of high pressure petroleum and gas pipelines, on behalf of government.
- **National Energy Regulator of South Africa:** It is the regulatory authority for electricity, piped gas and petroleum pipelines.
- **National Nuclear Regulator (NNR):** It is responsible for safety standards and regulatory practices for the protection of people, property and the environment against nuclear damage.
- **Nuclear Energy Corporation of South Africa (NECSA):** It is responsible for undertaking and promoting research and development in the field of nuclear energy and radiation sciences. It is also responsible for processing source material, including uranium enrichment, and cooperating with other institutions, locally and abroad, on nuclear and related matters.
- **South African National Energy Development Institute:** It is mandated to stimulate innovation in energy research and development, transform the

gender and race profile of researchers in the sector, and improve South Africa's competitiveness in energy research internationally.

- **Central Energy Fund (CEF):** It is governed by the CEF Act of 1977 and the Companies Act of 2008. Its mandate is to research, finance, develop and exploit appropriate energy solutions to contribute to South Africa's security of energy supply.

  Through its subsidiaries, the fund is also mandated to finance and promote the acquisition of coal; exploit coal deposits; manufacture liquid fuel, oil and other products from coal; market these products; and acquire, generate, manufacture, market, distribute or research any other form of energy.

  The fund's subsidiaries are: the Petroleum Oil and Gas Corporation of South Africa (PetroSA); South African Gas Development Company; PASA; Oil Pollution Control South Africa; the Strategic Fuel Fund; African Exploration Mining Finance Corporation; ETA Energy; and CCE Solutions.

  Over the medium term, the fund will continue to focus on consolidating three subsidiaries, improving its liquidity and solvency through new business development and expansions for revenue growth, and optimising feedstock for the gas-to-liquid facility.
- **PetroSA:** It is a wholly state-owned company of the Government of South Africa and registered as a commercial entity under the South African law. It is a subsidiary of the CEF.
- **National Radioactive Waste Disposal Institute (NRWDI):** It was established in terms of the NRWDI Act of 2008 to manage the disposal of radioactive waste at the national level. The institute is responsible for the long-term care and disposal of radioactive waste in a safe, technically sound, socially acceptable, environmentally responsible and economically feasible manner.

  Over the medium term, the institute planned to focus on finalising the transfer of the Vaalputs low-level waste disposal function from NECSA, and the allocation of the nuclear installation licence from the NNR. This will allow the institute to become the licence holder and thereby generate its own revenue by providing waste disposal and related services to waste generators.

  In its efforts to safely dispose of the national inventory of radioactive waste, the institute will continue to prepare for the establishment of a centralised storage facility for the long-term storage of spent nuclear fuel.

Mining Qualifications Authority (MQA)

The future of mining in the country depends largely on the successful implementation of skills development initiatives. Particular focus is placed on artisan and artisan aid as well as other technical skills.

The MQA was established as a sector education and training authority, and

facilitates the development of appropriate knowledge and skills in the mining, minerals and jewellery sectors.

Reserves

Gold

The Witwatersrand Basin remains the world's largest gold resource and South African gold only accounts for 4.2% of global gold production, according to the Minerals Council South Africa. The large-scale gold mines operating in South Africa include the record setting TauTona Gold Mine, which extends 3,9 km underground. TauTona means "great lion" in Setswana.

Coal

South Africa derives over 70% of its energy requirement (electricity and liquid fuels) from coal. According to the Minerals Council South Africa, South Africa has coal reserves sufficient to satisfy its needs for more than a century.

However the locus of production is gradually shifting away from the traditional Witbank or Emalahleni coalfield as collieries approach the end of their productive lives. Emphasis is being placed on exploring and developing the Waterberg coalfield as well as others in Limpopo.

Platinum group metals (PGMs)

PGMs include platinum, palladium, rhodium, iridium, osmium and ruthenium. These metals are extremely resistant to corrosion, hence they are used in a number of industrial processes, technologies and commercial applications.

Consumer and industrial products made with platinum and other PGMs include flat-panel monitors, glass fibre, medical tools, computer hard drives, nylon and razors.

South Africa's Bushveld Complex hosts approximately 80% of PGM-bearing ore. In medical applications, PGMs are used in the manufacture of anti-cancer drugs, cardiac treatment, implants and dental applications.

Platinum

The Merensky Reef, stretching from southern Zimbabwe through to the Rustenburg and Pretoria regions, is the centre of platinum mining in South Africa, playing host to companies such as Rustenburg Platinum Mines and Bafokeng Rasimone Platinum Mines.

Palladium

South Africa is the world's second-largest palladium producer. All of South Africa's production is sourced from the Bushveld Igneous Complex, which hosts the world's largest resource of PGMs. Palladium, together with platinum, is more abundant than any of the other PGMs.

Chrome ore

According to the US Geological Survey of 2018, South Africa and Kazakhstan host 95% of the world's chromium reserves (shipping grade), at 200 000 tonnes and 230 000 tonnes, respectively. South Africa has 72% of the world's chrome resources.

Copper

Palabora, a large copper mine, smelter and refinery complex managed by the Palabora Mining Company in Limpopo is South Africa's only producer of refined copper. Useful by-product metals and minerals include zirconium chemicals, magnetite and nickel sulphate as well as small quantities of gold, silver and platinum.

Substitutes for copper include aluminium which is used in power cables, electrical equipment, automobile radiators, and cooling and refrigeration tubing. Titanium and steel are also substitutes used in heat exchangers.

Optical fibre substitutes for copper are used in telecommunications applications, and plastics substitutes for copper are used in water pipe, drainpipe and plumbing fixtures. The Ga-Ramokoka Carbonatite Complex in North West hosts numerous minerals that span an estimated tonnage of Rare Earth Elements at 470 thousand tonnes, phosphates at 300 thousand tonnes and copper 30 thousand tonnes. The potential value of a suite of minerals in the carbonatite is estimated at R1.4 billion.

Manganese

South Africa hosts the largest known deposit of manganese and the country is a leading producer of manganese globally. According to the Minerals Council South Africa, the sector produced 17 million tonnes of manganese representing in 2019, a 14% increase on the prior year.

According to the Minerals Council South Africa, manganese prices have been under pressure because of a strong increase in supply coupled with subdued demand out of China which is the core market for South African producers.

Diamonds

According to the Minerals Council South Africa, the country ranks among the top 10 diamond producers globally, producing 10% of the world's diamonds.
In 2019, about 7.2 million carats of diamonds were produced locally.

Industrial minerals

South Africa boasts a substantial industrial mineral endowment. This category of minerals generally does not get a lot of attention despite its notable size and potential. According to the Minerals Council South Africa, in 2019 industrial mineral sales amounted to R17.9 billion. Domestic sales of the minerals constituted 79% or R14.3 billion, while export sales contributed R3.5 billion or 19.5%.

Geology

South Africa has a long and complex geological history dating back to many years. The. preservation of so much Archaean geology, dating back more than 2 500 million years, has resulted in the Archaean Witwatersrand Basin, as well as several greenstone belts, being preserved.

Energy

South Africa continues to pursue an energy mix as espoused in the country's energy blueprint, the Integrated Resource Plan (IRP). Even though South Africa and the rest of the world are increasingly under pressure to mitigate against climate change, South Africa's energy capacity is largely dependent on fossil fuels such as coal and petroleum.

Although the country has vast reserves of coal and petroleum resources that it continues to exploit, it has begun investing in clean technologies to ensure transition from a high to low carbon economy, while ensuring security of energy supply.

National Strategic Fuels Stock Policy

The National Strategic Fuels Stock Policy sets out the framework for the storage of fuel stock by government and the industry. It aims to ensure uninterrupted supply of petroleum products throughout South Africa by providing adequate strategic stocks and infrastructure such as storage facilities and pipeline capacity.

Strategic stocks are to be used during declared emergencies. The Minister of Mineral Resources and Energy will have the power to decide when a shortage of fuel and oil is at such a level to warrant an emergency.

National Liquid Petroleum Gas (LPG) Strategy

The LPG Strategy's main objectives are to provide access to safe, cleaner, efficient, portable, environmentally friendly and affordable thermal fuel for all households, and to switch low income households away from the use of coal, paraffin and biomass to LPG.

The strategy highlights strategic options that could be adopted for the orderly development of the LPG industry in South Africa to make LPG an energy carrier of choice for thermal applications. LPG. As part of the gas industrialisation, the DMRE has embarked on the LPG Expansion Initiative.

LPG is considered the safest, cleanest, sustainable and most efficient form of energy for cooking, space heating as well as water heating. The department planned to set a target to double consumption of LPG in South Africa over the next five years to alleviate pressure on the Eskom power supply.

National building standards

Energy-efficient regulations for new buildings form part of the deliverables of South Africa's National Energy Strategy to strengthen standards and regulations for energy efficiency. The energy-efficient regulations apply to residential and commercial buildings, places of learning and worship, certain medical clinics and other categories of building.

The regulations make it compulsory for all new buildings to be designed and constructed to a standard that makes it possible for the user to minimise the energy required to meet the functional requirements.

This will save energy significantly, which will relieve pressure on the electricity supply grid. In addition to temperature regulations, all buildings will also have to be fitted with renewable-energy water-heating systems such as solar systems, which also have to comply with South African national standards.

Southern African Power Pool (SAPP)

The SAPP was created with the primary aim to provide reliable and economical electricity supply to the consumers of each of the SAPP members, consistent with the reasonable use of natural resources and the effect on the environment.

The SAPP allows the free trading of electricity between Southern African Development Community member countries, providing South Africa with access to the vast hydropower potential in the countries to the north, notably the Congo River (Inga Falls).

Electricity

In 2020, government committed to interventions to deal with electricity supply shortages and undertook to rapidly increase energy generation capacity outside

of Eskom. The interventions include:

- The connection of 1 200 megawatts (MW) to the grid from projects signed under bid window 4 of the Independent Power Producers (IPP) Programme, with the remaining 1 000 MW planned to connect by not later than December 2021.
- The approved preferred bidders were expected to deliver additional MW of power into the grid within the next 12 to 18 months.
- Eskom procuring 200 MW from IPPs under the Short-Term Power Purchase Programme.

Government has amended the Electricity Regulations on New Generation Capacity and clarified the requirements for municipalities when undertaking the process to develop or buy power from IPPs.

It has also amended and gazetted Schedule 2 of the Electricity Regulation Act of 2006 to increase the threshold for registering embedded generation from 1 to 10 MW.

Biofuel

The biofuels industry in South Africa, the continent's biggest agricultural producer, has been held back by an inadequate regulatory regime and concerns that biofuels would hurt food security and affect food prices.

Canola, sunflower and soya are feedstock for biodiesel, while sugarcane and sugar beet are feedstock for ethanol. Maize, South Africa's staple food, will not be used in the production of biofuels to ensure food security and control high prices.

The biofuels sector has strong linkages to agriculture, manufacturing and distribution, and has the potential to create substantial numbers of labour-intensive jobs in the agriculture sector in particular. In addition, second-generation biofuel technology will also contribute to South Africa meeting its renewable energy targets sustainably.

Hydropower

Energy from water can be generated from waves, tides, waterfalls and rivers and will never be depleted as long as water is available. South Africa has a mix of small hydroelectricity stations and pumped-water storage schemes.

Solar power

Most areas in South Africa average more than 2 500 hours of sunshine per year, and average daily solar-radiation levels range between 4,5 kWh/m2 and 6,5 kWh/m2 in one day. The southern African region, and in fact the whole of Africa, has

sunshine all year round. The annual 24-hour global solar radiation average is about 220 W/m2 for South Africa.

Solar energy is used to power equipment such as watches, calculators, cookers, water heaters, lighting, water pumping, communication, transportation, power generation, and many more.

Solar energy, like all other renewable energies, is very safe and environmentally friendly. There are no emissions as the source of fuel is the sun, unlike coal-powered stations.

Wind power

Wind energy, like solar energy, is a free and sustainable renewable energy source that is being used to generate electricity. The amount of energy that can be extracted from the wind depends on its speed.

The higher the wind speed, the more energy can be harnessed to generate electricity on a large scale. South Africa has fair wind potential, especially along the coastal areas of the Western Cape and Eastern Cape.

Hybrid systems

Hybrid energy systems are a combination of two or more renewable energy sources such as photovoltaic, wind, microhydro, storage batteries and fuel-powered generator sets to provide a reliable off-grid supply.

Nuclear

Government has committed, through the Nuclear Energy Policy and IRP, to an energy mix consisting of coal, gas, hydro, nuclear, solar and wind. The nuclear new build programme will enable the country to create jobs, develop skills, create industries, and catapult the country into a knowledge economy. The IRP 2010-2030 envisages 9 600 MW additional nuclear capacity by 2030. The IRP is a 20-year projection on electricity supply and demand.

Eskom operates the Koeberg Nuclear Power Station near Cape Town, the only nuclear power station in South Africa and the entire African continent, which supplies power to the national grid. The Koeberg Nuclear Power Plant units will reach the end of life in July 2024 and plans are underway to extend the life of this plant by an additional 20 years.

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

The REIPPPP, established in 2010, has become one of the world's most progressive and successful alternative energy programmes. Ever since the introduction of these renewable energy technology programmes (solar, wind,

biomass, small hydro and landfill gas power), plants have been going up across the country, feeding additional, clean energy into the national grid.

The REIPPPP represents the country's most comprehensive strategy to date in achieving the transition to a greener economy. The programme has been designed to contribute to the development of a local green industry and the creation of green jobs.

The programme seeks to procure energy from small-scale IPPs, with projects that generate between one MW and five MW of energy from solar, wind, biomass and landfill gas projects.

Through the REIPPPP, government is targeting the procurement of 13 225 MW from IPPs by 2025.

Working for Energy Programme

The Working for Energy Programme is a social programme mainly intended to provide energy services derived from renewable resources to rural and urban low income houses in a manner that facilitates job creation, skills development, community-based enterprise development and the emancipation of youth, women and people with disabilities thereby creating sustainable livelihoods. It is an integral part of the Expanded Public Works Programme.