



ESKOM'S COMMITMENT TO THE ENVIRONMENT

Sustainability at Eskom refers to providing affordable energy and related services through the integration and consideration of economic development, environmental quality and social equity into business practices in order to continually improve performance and underpin development. This allows us to take a long-term view and ensure that the scope of our work covers all relevant elements, assesses the practicality of implementation and includes issues such as technology development and deployment, quality, risk, safety and skills development.

Eskom's first formalised environmental policy was in place in 1980. It was based on the Electricity Act, Act No. 40 of 1958, while the environmental element within the Safety, Health, Environment and Quality (SHEQ) policy for Eskom today is one that is based on the International ISO 14001 environmental management standard. The focus in 1980 was on minimising our environmental impacts, while today it is on ensuring duty of care by prevention of pollution and environmental degradation, engaging stakeholders, ensuring that the planning process takes into account a low-carbon future, and prioritising energy efficiency. To fulfil the policy, Eskom's current environmental management strategy focuses on the broad concept of "reducing the environmental footprint and living Zero Harm".

Air Quality

Approximately 93% of the electricity produced by Eskom is generated from coal. Eskom's power stations burn over 120 million tons of coal a year. South Africa has abundant coal reserves, and coal remains the cheapest source of producing electricity. This makes coal-fired power stations reliable in generating base-load power.

Emissions from burning coal are generally determined by the quality of coal and its constituents. The main constituents of coal include carbon (C), sulphur (S), nitrogen (N) and ash (particulates). The ash is removed with an electrostatic precipitator or fabric filter plant, and then the flue gas is released into the atmosphere via tall stacks which assist dispersion. In the new power stations under construction, emissions of oxides of nitrogen will be reduced by using low NOx burners, and emissions of SO₂ will be reduced by flue gas desulphurisation.

- **Particulate emissions**

Each power station has an Atmospheric Emission Licence (or an APPA Registration Certificate which will be renewed to an Atmospheric Emission Licence in the next month or so), which has limits for the concentrations of particulates (ash), sulphur dioxide and oxides of nitrogen that may be emitted. Most of the ash produced at power stations is not emitted from the stacks, but is captured and deposited on ashing facilities. Emissions of ash from Eskom's power stations are greatly reduced by electrostatic precipitators, usually aided by flue gas conditioning plants, or fabric filter plants. These technologies have an efficiency of at least 99%, and over 99,9% in many cases. Ash emissions from stations with electrostatic precipitators are less than 300 mg/Nm³ and less than 75 mg/Nm³ in some cases, and ash emissions from stations with fabric filter plants are less than 50 mg/Nm³.

Internal Relative Emission targets are also set for each station and these counts towards the Stations' performance contracts. Targets are set based on abatement technology used, planned outages, coal burned, etc.

Keeping the human factor in mind, Eskom's Environmental Management Policy requires that all operators be trained and regularly retrained on the environmental implications of electricity generation. Plant maintenance and refurbishment is still a huge challenge for Eskom, especially on its ageing plant currently in operation, due to the electricity demand in the country.

- **Gaseous emissions**

- Carbon dioxide (CO₂) emissions from the entire Eskom coal-fired fleet range between 200 – 250 Mt per year
- Sulphur dioxide (SO₂) emissions from the entire Eskom coal-fired fleet range between 1 800 kT to 1 860 kT per year.
- Nitrogen oxide (NOx) emissions from the entire Eskom coal-fired fleet range between 900 kT to 1000 kT per year.

Air management

Emissions from Eskom's power stations are very effectively dispersed by being released from tall stacks. The Duvha Power Station has the tallest stacks of all the power stations, at just over 300 metres. The tall stacks ensure that the emissions are well diluted before they reach ground level.

Emissions of ash are continuously monitored from all units/stacks, and gaseous emissions (sulphur dioxide, nitrogen oxides and carbon dioxide) are monitored on one unit/stack at each power station. Gaseous emission monitors will be installed on all units by April 2015. Total gaseous emissions from the power stations are calculated on a monthly basis. Emissions from power stations are reported to the Emission Licencing Authorities (Provincial Government or District Municipalities) each month.

Eskom has a network of 16 ambient air quality monitoring stations around the country, usually in the vicinity of power stations. These monitoring stations measure the levels of pollutants which people breathe, and to which ecosystems are subjected. This is to make sure that people who live near power stations are not negatively affected or get sick as a result of any pollutants from power stations.

The parameters meters measured at these ambient air quality monitoring stations include, SO₂, NO_x, Ozone (O₃), fine particulate matter (FPM) and wind speed and direction
Ambient air quality results from the Eskom monitoring stations can be requested from the SAAQIS website, www.SAAQIS.org.za.

Water Management

Water use performance stabilised. Water used as part of the process to generate electricity increased slightly from 1.34 to 1.35 litres/kWh. Net raw water consumption increased.

Mindful of the fact that South Africa is a water scarce country, Eskom spends considerable time and effort finding ways to improve its water usage practices. Success in this regard is attested to by the fact that Eskom operates some of the largest dry-cooled power stations in the world.

Strict targets for water usage at each power station are set annually, requiring strong management focus to attain. Eskom has also developed processes ensuring the re-use of water at a power station and that no water used at a station is released into the external environment.

Eskom continues to explore the use of mine water as a supplementary source to its overall water abstraction. The organisation is mindful of the importance of water to its business, as well as to the development of the country. It continually assesses the impact of water related issues on its business, and actively participates in the formation of catchment management agencies.

Key environmentally related water research projects undertaken include the development of a water model for optimised water management, a surface- and groundwater monitoring programme and brine disposal management.

The Department of Water and Environmental Affairs recognises Eskom as the only strategic water user in South Africa.

Management of Biodiversity

During the years of expansion (1980 to 1989) and before the era of having legislative environmental impact assessments, measures to preserve the indigenous bushveld were included in the pre-construction planning of Matimba power station, in Lephalale.. It was also during this time that there was strong cooperation between Eskom and the provincial environmental authorities in the conservation of the sungazer lizard (*Cordylus giganteus*) at the site of Majuba power station. One significant lesson from Eskom's strategic partnership with EWT from the 1970s is the value of working in partnership with environmental conservation NGOs. The Ingula partnership with BirdLife South Africa and Middelpunt Wetlands Trust has proven invaluable towards the conservation of a very important biome, ensuring the protection of the critically endangered white-winged flufftail, southern bald ibis, other endangered species, and the habitat in which they exist. The Ingula partnership has also resulted in Eskom leadership endorsing research funding to the BirdLife International Species Champion Programme, through which Eskom will fulfil the species champion role for both the white-winged flufftail and the southern bald ibis. This initiative promotes the overall protection and conservation of these bird species. Eskom's approach to the management of its land as conservation areas reached a highlight in 1992 when the Koeberg Nature Reserve was promulgated. Peter Nelson was appointed as the first Conservation Officer for the Koeberg Nature Reserve and he is currently the Conservation Manager at Ingula. Ingula is currently undergoing the process to be promulgated as a RAMSAR site due to the sensitivity of this environment. Ingula will be Eskom's second Nature Reserve.

Waste

In 2001, Eskom implemented a waste management directive requiring the proactive management of waste in support of integrated environmental management.

Key research projects in this regard include a review of the national road traffic regulations focusing on hazardous substances, cleaner production in the electricity sector focusing on waste minimisation at power stations and the initiation of research on the use of used bag filters in the production of composite materials.

Eskom Holdings SOC Limited supports government's commitment to waste management ensuring the protection of South Africa's environment. This is defined specifically in the National Waste Management Strategy (NWMS) of 2011, the National Environmental Management Act, 1998 (Act 107 of 1998) and National Environmental Management Waste Act, 2008 (Act 59 of 2008) and the regulations thereunder, not excluding other relevant environmental legislation and international agreements to which South Africa is a party.

Eskom Holdings SOC Limited will practice the five environmental management principles in line with NEMA (107 of 1998)

- Duty of care - the waste is avoided, minimised, reused or recycled or otherwise disposed of in a responsible manner
- Cradle to grave- responsibility for the waste and the considerations of the waste exist throughout its life cycle
- Polluter pays principle – any organisation causing pollution is liable for the costs of cleaning it up
- Precautionary principle – always assume that waste is hazardous until shown to be safe:
- Preventative principle – reduce risk by collection, treatment and disposal to take place as near as possible to the point of generation as is technically and environmentally feasible.

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For more information on Eskom related topics see the Eskom website (www.eskom.co.za).
Select the “About Electricity” and “Facts and Figures”