



SUSTAINABLE
**WATER &
ENERGY**
SOLUTIONS
NETWORK

Water Conservation in Dry-Cooled Coal-Fired Thermal Power Plants: Kendal Power Station



Sustainable Development Goals Addressed



Name of Water and/or Energy Project, Institution or Company

Eskom Holding (SOC) Ltd, Public service company.

Location of project site, Country

Kendal Power Station, Kendal, South Africa

Brief narrative description of objective/project/activity/initiative

Eskom Ltd is South Africa's largest public service electric utility company operating most power stations and accounting for some 95 per cent of electricity generation of the country. South Africa's power supply depends first and foremost on coal for electricity generation. Eskom also operates the country's transmission system. It participates in the Southern African Power Pool and supplies electricity to neighbouring countries in the region, including Botswana, Lesotho, Mozambique, Namibia, Swaziland, and Zimbabwe. It imports electricity from the more distant Cabora Bassa HPP in Mozambique.

Kendal power station is the largest indirect dry-cooled coal-fired power station in the world. It was officially opened in 1994. Kendal has six 686 MW units and an installed capacity 4,116 MW. It is located 40 km west of Witbank in Mpumalanga Province, South Africa.

There are abundant coal resources in the Mpumalanga Province. However, available local water supplies are under serious strain, as there are three elder large wet-cooled power stations in the same area (Kriel, Matla and Duvha). Limited water resources and rising cost of water were the major consideration that influenced Eskom's decision to invest in dry cooling technology.

Evaporation losses in wet-cooled systems account for approximately 80 per cent of the water requirements of a conventional wet-cooled power station. Whereas wet-cooled power stations may consume as much as 2,5 l / kWh, the dry-cooling systems consume only 0,2 l / kWh. The dry cooling system at Kendal Power station consumes only a fraction of the water that is needed in wet-cooling systems. The operation of dry cooling systems require electricity, hence the net operating efficiency of a dry-cooled power station is about 20 per lower than the efficiency of a wet-cooled power station.

Economic, environmental and climate benefits, challenges and lessons learned

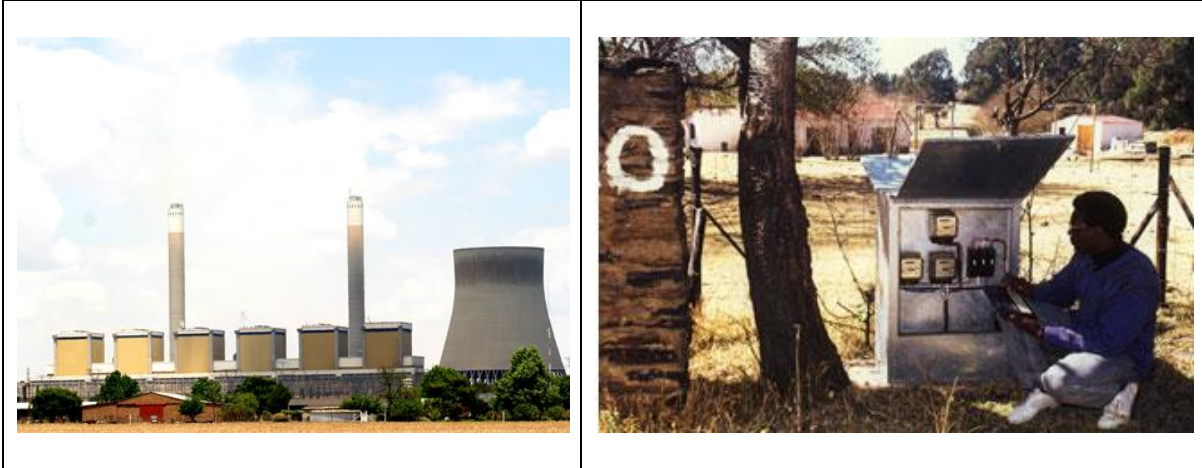
The Kendal Power Station provide a very important contribution to South Africa's power supply system. Its technology is also suitably adapted to the water scarcity prevailing in the region. However, Kendal Power station is not only one of the largest coal-fired power stations in the world; it is also a major emitter of air pollution and greenhouse gases. Local disposal of fly-ash can also pose environmental risk requiring adequate infrastructure and monitoring.

In addition to coal-based power stations, Eskom also operates one nuclear power station and a growing number of wind and solar power facilities, which are aimed to reduce the country's overall carbon foot-print.

Eskom is a signatory to the UN Global Compact

Additional information: website addresses and contacts

General information on Eskom Operations: www.eskom.co.za, and detailed information on Kendal coal-fired power station: <http://www.eskom.co.za/sites/heritage/Pages/Kendal-Power-Station.aspx>



Photos from Eskom Webpage (permission to be requested)