NOVEMBER 2007

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

ANKERLIG POWER STATION CONVERSION AND TRANSMISSION INTEGRATION PROJECT

WESTERN CAPE PROVINCE

CONVERSION OF THE EXISTING ANKERLIG POWER STATION
(AN OPEN CYCLE GAS TURBINE – OCGT- PLANT)
TO A COMBINED CYCLE GAS TURBINE (CCGT) PLANT
AND
CONSTRUCTION OF AN ASSOCIATED
400 kV TRANSMISSION POWER LINE FROM
ANKERLIG POWER STATION TO OMEGA SUBSTATION

AN ESKOM INITIATIVE

BACKGROUND INFORMATION DOCUMENT

Savannah
ENVIRONMENTAL (PTY) LTD

Eskom Holdings Limited is investigating the conversion of the nine units at the existing Open Cycle Gas Turbine (OCGT) plant at Ankerlig Power Station (located in Atlantis Industria) to a Combined Cycle Gas Turbine (CCGT) plant in order to increase the generating capacity of this existing power station by approximately 720 MW. The proposed conversion involves the establishment of infrastructure associated with CCGT units and will be developed on the site of the existing Ankerlig OCGT power station.

Eskom Holdings Limited is proposing the construction of a 400kV transmission power line between the Ankerlig Power Station and the already authorised Omega Substation (to be located on the Farm Groot Oliphantskop 81) to transmit the additional power generated at this power station into the National electricity grid.

The nature and extent of this project is explored in more detail in this document.

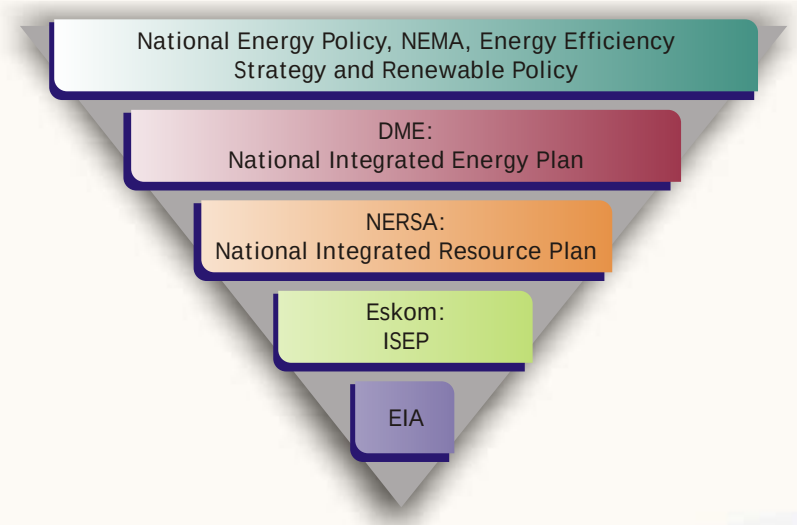
Aim of this background information document

This document aims to provide you, as an interested and/or affected party (I&AP), with:

» an overview of the proposed Ankerlig conversion project proposed by Eskom.
» an overview of the Environmental Impact Assessment (EIA) process and studies being undertaken to assess the project.
» details of how you can become involved in the EIA process, receive information, or raise issues, which may concern and/or interest you.

Policy planning and Eskom

Eskom is responsible for the provision of reliable and affordable power to its consumers in South Africa. The decision to expand Eskom's electricity generation capacity is based on national policy and informed by on-going strategic planning undertaken by the national Department of Minerals and Energy (DME), the National Energy Regulator of South Africa (NERSA) and Eskom (the hierarchy of policy and planning documentation is illustrated below). Through this planning process, the long-term view of electricity demand and supply in South Africa is forecasted and assessed, and the framework for Eskom and South Africa to investigate a wide range of supply- and demand-side technologies and options is provided.



These planning processes all indicate that South Africa will require ~5 000 MW of power in the next five years, consisting of both base load[1] electricity generating capacity and peaking[2] electricity generating capacity. To supply this additional power, a variety of options, including conventional pulverised fuel plants, pumped storage schemes, gas-fired plants (open cycle and combined cycle), nuclear plants, greenfield fluidised bed combustion technology and renewable energy technology (mainly wind and solar projects) continue to be investigated by Eskom.

As part of the increased electricity supply plan, Eskom Holdings Limited is proposing the conversion of the nine units at the existing Ankerlig OCGT Power Station to a Combined Cycle Gas Turbine (CCGT) Power Station. Due to the medium-term forecast in the demand for electricity (2010 - 2014) and constraints associated with meeting this projected demand, the conversion of these OCGT units to CCGT units is one of the few options available to Eskom to meet this projected demand. This conversion will increase the generating capacity of the Ankerlig Power Station by approximately 720 MW through a more efficient process (i.e. more power generated and sent out, for the same amount of fuel used). Overall thermal efficiency is therefore increased from approximately 34% for the current OCGTs to approximately 50-55% for the proposed CCGT.

Electricity cannot be readily or inexpensively stored and must be used as it is generated. It is, therefore, required that electricity must be efficiently transmitted from the point of generation to the end user. It is vital that transmission capacity keeps up with both electricity generation capacity and electricity demand. Therefore, in order to transmit the additional power generated at the Ankerlig Power Station into the National electricity grid, Eskom Holdings Limited is proposing the construction of a new 400kV transmission power line between the Ankerlig Power Station and the already authorised Omega Substation (to be located on the Farm Groot Oliphantskop 81).

What does the Conversion Project Entail?

The existing Ankerlig OCGT Power Station is located in the Atlantis Industrial zone (refer to the attached map), ~40 km from the Cape Town city centre. This power station consists of 9 OCGT units (i.e. four existing OCGT units, plus an additional five OCGT units, currently under construction), each with a nominal capacity of ~150 MW, resulting in a total nominal capacity of 1350 MW for the power station. Each OCGT unit consists of one gas turbine driving an electric generator.

The concept of converting the OCGT units to CCGT units is to utilise 'waste' heat from the exhaust of the gas turbine to drive a steam turbine, instead of this heat being exhausted to the atmosphere. When the hot gas exits the turbine as exhaust gas, it has a temperature of up to 600°C. This heat energy is transferred to the water in the heat recovery steam generator. The heat is used to generate water vapour, which powers the steam turbine. The resulting mechanical energy is transferred to the generator. In the generator mechanical energy from the steam turbine is converted into electricity. The condenser converts exhaust steam from the steam turbine back into water through a cooling process.

It is estimated that each converted unit will produce ~80 MW additional capacity, i.e. approximately 50% more than a standard OCGT unit. Therefore, an additional 9 x 80 MW (720 MW total) increase in capacity is foreseen from the OCGT-CCGT conversion. The proposed conversion will be on the site of the existing Ankerlig Power Station, and will not require any additional land take outside of the existing power station boundaries.

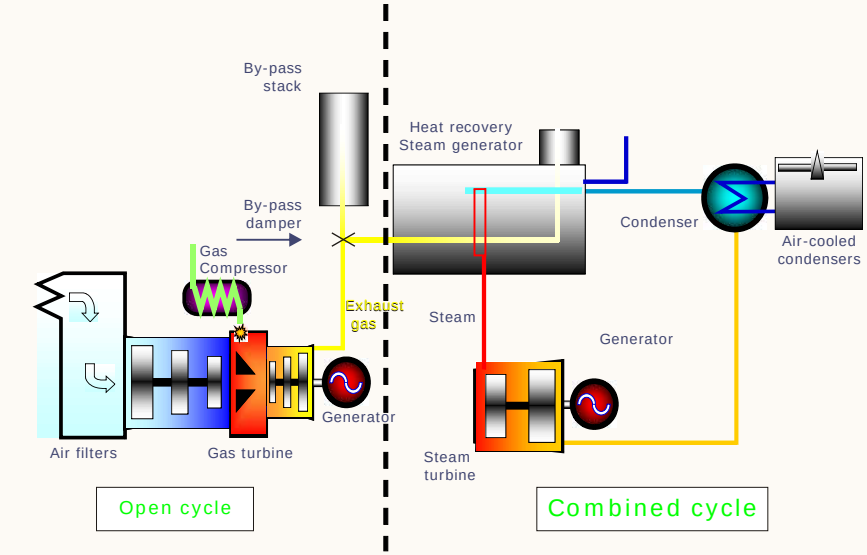
[1] Power generation technology designed to generate electricity continuously for all hours of the day and night (i.e. 24 hours)
[2] Power generation technology designed to generate electricity during periods of high electricity demand, generally in the weekday mornings from 07:00 to 09:00 and weekday evenings from 18:00 to 20:00

A heat recovery steam generator (HRSG) is the main component to be added to the existing gas turbine. In addition, for each unit, there will be a bypass stack for the CCGT, anticipated to be ~60 m in height. Water will be required for the CCGT power generation process, including some for cooling. Various water resource options are currently being investigated, including the use of groundwater from the underground aquifer in the Atlantis area, the use of wastewater from a nearby wastewater treatment plant, and the use of desalinated sea water piped to the power station from the coast. A preferred option will be nominated for implementation based on technical, environmental and economic constraints.

A number of options for the CCGT cooling technology have been investigated by Eskom, including dry-cooled technology and wet-cooled technology. Due to financial and technical constraints, dry-cooled technology has been nominated as a preferred option for implementation. Dry-cooling technology is less water-intensive (i.e. uses significantly less water) than wet-cooled technology, and consists of a system of air-cooled condenser fans situated in fan banks approximately 50 m above ground. In a direct dry-cooled system, the steam is condensed directly by air in a heat exchanger (air cooled condenser) and the condensate is returned to the steam cycle in a closed loop. The air flow is induced solely by mechanical draft (i.e. caused by fans) in the air cooled condensers.

Conversion of the units to CCGT is based on increased cycle efficiency. The CCGT units would utilise the same amount of liquid fuel (i.e. diesel) as is currently the case for the OCGT units (i.e. approximately 40 tons of diesel/unit/hour) for the same operating regime. However, in order to meet the electricity supply demand in the medium-term, the plant will have to operate for more hours per day than was anticipated for the OCGT plant (i.e. higher than anticipated load factors). This higher load factor would require higher fuel consumption. The installation of a liquid fuel pipeline to the Ankerlig Power Station, as well as transport of fuel by rail is currently being investigated as part of a separate EIA application. Additional fuel storage facilities may also be required at the Ankerlig Power Station to cater for the increased fuel requirements associated with the higher load factor.

It is important to note that the CCGT units can be both liquid fuel-fired or natural gas-fired. It is envisaged that the CCGT units would initially be diesel-fired, until such time that natural gas becomes available.



Simplified schematic CCGT diagram

Integration of the CCGT Power Station into the National Grid

Eskom Holdings Limited is proposing the construction of a 400kV transmission power line between the Ankerlig Power Station and the already authorised Omega Substation (to be located on the Farm Groot Oliphantskop 81) to transmit the additional power generated at this power station to the National electricity grid

Technically feasible alternative transmission power line alignment corridors have been identified for investigation within the EIA process. These are reflected on the attached map. Through the EIA process, a preferred alternative transmission power line corridor will be nominated. The procurement of servitudes will be through a negotiation process with each affected landowner and will be subject to the project being authorised by DEAT. The process of servitude negotiating is independent of the EIA process.

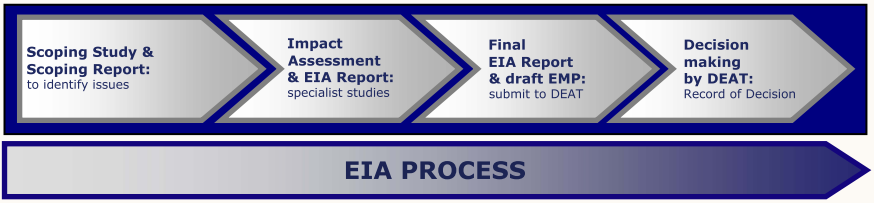
ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In terms of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, No 107 of 1998), Eskom requires authorisation from the National Department of Environmental Affairs and Tourism (DEAT) (in consultation with the Western Cape DEA&DP) for the undertaking of the proposed project. In order to obtain authorisation for this project, comprehensive, independent environmental studies must be undertaken in accordance with the EIA Regulations. This project has been registered with National DEAT under Application Reference numbers 12/12/20/1014 (power station conversion) and 12/12/20/1037 (transmission line).

An EIA is an effective planning and decision-making tool. It allows the environmental consequences resulting from a technical facility during its establishment and its operation to be identified and appropriately managed. It provides the opportunity for the developer to be fore-warned of potential environmental issues, and allows for resolution of the issue(s) reported on in the EIA report as well as dialogue with affected parties.

Eskom has appointed Savannah Environmental, as independent consultants, to undertake a Scoping and Environmental Impact Assessment to identify and assess all potential environmental impacts associated with the proposed project for the area as identified, and propose appropriate mitigation measures in an Environmental Management Plan (EMP). As part of these environmental studies, I&APs will be actively involved through the public involvement process being undertaken by Sustainable Futures.

The phases of an EIA are:



What are the potential environmental impacts associated with the proposed project?

A number of potential environmental impacts associated with the power station conversion project and transmission power line have been identified. These potential impacts will be assessed through the following specialist studies:

- Groundwater resources evaluation (water supply options)
- Impacts on noise and air quality (power station)




- Impacts on ecology, fauna and flora (transmission power line)
- Impacts on avifauna (transmission power line)
- Impacts on heritage sites (transmission power line)
- Impacts on visual quality and aesthetics (power station and transmission power line)
- Impacts on the social environment (power station and transmission power line)

These specialist studies will be undertaken in two phases:

1. A desk-top Scoping Study, wherein potential issues associated with all alternatives identified will be evaluated and a preferred alternative nominated for consideration in the EIA phase.
2. A detailed assessment of potentially significant impacts associated with the nominated preferred alternative identified in the Scoping Phase. Practical and achievable mitigation measures will be recommended in order to minimise potentially significant impacts identified. These recommendations will be included within a draft Environmental Management Plan (EMP).

Specialist studies will be informed by existing information, field observations and input from the public participation process. As an I&AP, your input is considered an important part of this process, and we urge you to become involved.

Public Involvement Process

The sharing of information forms the basis of the public involvement process and offers you the opportunity to become actively involved in the EIA from the outset. Comments and inputs from I&APs during the EIA process are encouraged in order to ensure that potential impacts are considered within the ambit of the study.

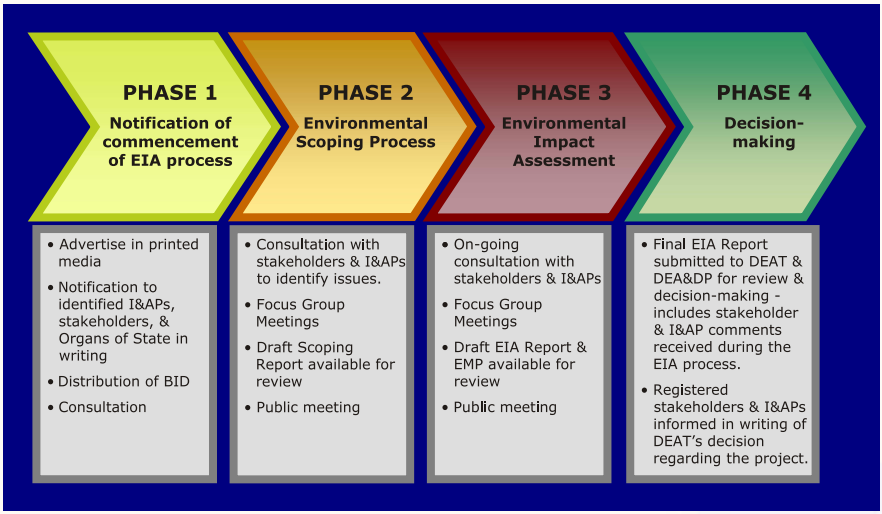
The public involvement process aims to ensure that:

» Information containing all relevant facts in respect of the application is made available to I&APs for review.

» Participation by potential I&APs is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the application.

» Adequate review periods are provided for I&APs to comment on the findings of the draft Scoping and EIA reports.

In order to ensure effective participation, the public involvement process includes the following steps:



Your responsibilities as an I&AP

In terms of the EIA Regulations, your attention is drawn to your responsibilities as an I&AP:

» In order to participate in this EIA process, you must register yourself on the project database.
» You must ensure that any comments regarding the proposed project are submitted within the stipulated the time frames.
» You are required to disclose any direct business, financial, personal or other interest which that you may have in the approval or refusal of the application for the proposed project.

How to become involved

1. By responding (by phone, fax or e-mail) to our invitation for your involvement which has been advertised in local and national newspapers.
2. By returning the attached Reply Form to the relevant contact person.
3. By attending the meetings to be held during the course of the project. As a registered I&AP you will automatically be invited to attend these meetings. Dates for public meetings will also be advertised in local and regional newspapers.
4. By contacting the consultants with queries or comments.
5. By reviewing and commenting on the draft Scoping and EIA Reports within the stipulated 30-day review periods.

If you consider yourself an I&AP for this proposed project, we urge you to make use of the opportunities created by the public involvement process to provide comment, or raise those issues and concerns which affect and/or interest you, and about which you would like more information. Your input into this process forms a key element of the EIA process.

By completing and submitting the accompanying Reply Form, you automatically register yourself as an I&AP for this project, and are ensured that your comments, concerns or queries raised regarding the project will be noted.

Comments and queries

Direct all comments, queries or responses to:

Shawn Johnston of Sustainable Futures ZA
PO Box 749, Rondebosch, CAPE TOWN, 7701
Phone: 083 325 9965
Fax: 086 510 2537
E-mail: swjohnston@mweb.co.za

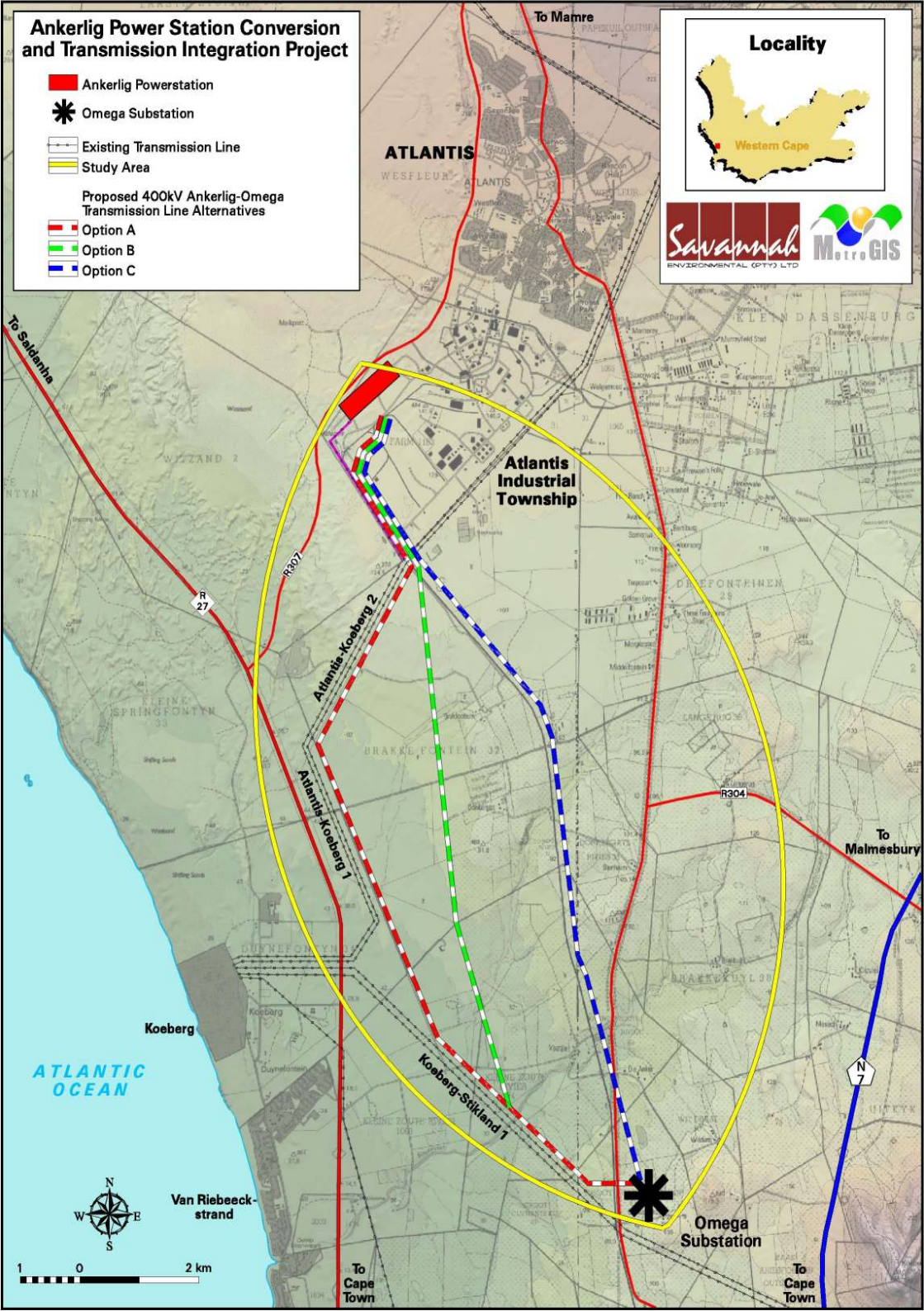
To view project documentation, visit

www.savannahsa.com

or

www.eskom.co.za/eia





Ankerlig Power Station Conversion and Transmission Integration Project
Ankerlig Powerstation
Omega Substation
Existing Transmission Line
Study Area
Proposed 400kV Ankerlig-Omega Transmission Line Alternatives
Option A
Option B
Option C
Locality
Western Cape
Savannah
ENVIRONMENTAL (PTY) LTD
Metro GIS
To Mamre
ATLANTIS
To Saldanha
Atlantis Industrial Township
R307
R 27
Atlantis-Koeberg 2
Atlantis-Koeberg 1
R304
To Malmesbury
Koeberg
ATLANTIC OCEAN
Koeberg-Stikland 1
N 7
Van Riebeeck-strand
Omega Substation
To Cape Town
To Cape Town
N
W
E
S
1
0
2 km