

BACKGROUND INFORMATION DOCUMENT - July 2015



FOR THE PROPOSED RENEWABLE ENERGY GENERATION PROJECTS:

EAST 2 SOLAR PARK AND EAST 3 SOLAR PARK, LOCATED ON THE REMAINDER AND PORTION 2 OF THE FARM EAST 270, KURUMAN RD

RHODES 2 SOLAR PARK, LOCATED ON THE FARM RHODES 269, KURUMAN RD

BOWDEN 1 SOLAR PARK AND BOWDEN 2 SOLAR PARK, LOCATED ON PORTION 1 OF THE FARM BOWDEN 223, KURUMAN RD

NEW 132 kV POWER LINES (DOUBLE CIRCUIT) FOR THE CONNECTION OF THE PROPOSED PROJECTS TO THE ESKOM GRID

WITHIN THE JOE MOROLONG LOCAL MUNICIPALITY, JOHN TAOLO GAETSEWE DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

This Background Information Document is related to five Renewable Energy Generation Projects and connection infrastructure (power lines) all North of Hotazel, under the jurisdiction of the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape Province:

- **Palus Energy (Pty) Ltd (Reg. No. 2013/087976/07)** is proposing the establishment of two solar energy generation facilities, called **East 2 Solar Park** and **East 3 Solar Park**, to be established on the **Remainder and Portion 2 of the farm East 270, Kuruman RD**.
- **Miko Energy (Pty) Ltd (Reg. No. 2013/097048/07)** is proposing the establishment of a solar energy generation facility, called **Rhodes 2 Solar Park**, to be established on the **Farm Rhodes 269, Kuruman RD**.
- **Nunki Energy (Pty) Ltd (Reg. No. 2013/097185/07)** is proposing the establishment of two solar energy generation facilities, called **Bowden 1 Solar Park** and **Bowden 2 Solar Park**, to be established on **Portion 1 of the farm Bowden 223, Kuruman RD**.

The renewable energy generation facilities will use photovoltaic (PV) technology and the five Photovoltaic (PV) Power Plants will have a **maximum generation capacity up to 75 MW each**.

Other PV plants are also being developed in this area and include the following projects:

- The **East Solar Park** planned on Remainder of the farm East 270, Kuruman RD and developed by **Osalus Energy (Pty) Ltd** which received Environmental Authorisation with DEA Ref. 14/12/16/3/3/2/664 on 31 March 2015.
- The **Rhodes 1 Solar Park** planned on the Farm Rhodes 269, Kuruman RD and developed by **Mira Energy (Pty) Ltd** which received Environmental Authorisation with DEA Ref. 14/12/16/3/3/2/614 on 12 December 2014.

New power lines will be required for the connection of the five solar parks to the Eskom network. In this respect, two power line corridors have been proposed:

- **Corridor 1** to the **Eskom Hotazel substation**: the proposed 132 kV power line corridor will be approximately 16.3 km long and will run parallel to the existing Eskom "Hotazel - Heuningvlei" 132 kV power line.

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- **Corridor 2** to the **new Eskom Umtu substation**: the proposed 132 kV power line corridor will be approximately 20.8 km long and will run parallel to the existing Eskom “Hotazel - Heuningvlei” 132 kV power line (for 14.8 km) and to the Eskom “Hotazel - Umtu” 132 kV power line (for 6.0 km).

Both of the power line corridors start from Portion 1 of the Farm Bowden 223 (where the Bowden 1 & 2 Solar Parks are planned) and are superimposed for the first 14.8 km; then Corridor 1 goes South to the Eskom Hotazel substation, while Corridor 2 goes West, parallel to the Eskom “Hotazel - Umtu” 132 kV power line up to the Eskom Umtu substation.

Each project will have a dedicated circuit for the connection to the Eskom grid. All 5 circuits will run over the proposed Corridor 1 and/or Corridor 2 and will be called:

East 2 132 kV circuit; East 3 132 kV circuit; Rhodes 2 132 kV circuit; Bowden 1 132 kV circuit and Bowden 2 132 kV circuit.

Up to three new power lines (double circuit) will be required for these 5 circuits.

The Corridor 2 may be used for the reinforcement of the Eskom grid in the area, by means of a **second 132kV power line linking the Hotazel substation to the Umtu substation**. In this respect, it should be noted that the Kudumane Manganese Resources (Pty) Ltd is currently assessing the feasibility of a new manganese mine to be located on the western side of the Farm Kipling 271 and/or on the Farm Umtu 281. Indeed they are the holders of prospecting rights over the Farm Kipling 271 and Farm Hotazel 280 and have already applied for mining rights. The Corridor 2, as well as the existing Eskom “Hotazel - Umtu” 132 kV power line, may potentially affect the future mine. **During the scoping phase, an alternative path will be evaluated for Corridor 2 in consultation with Kudumane Manganese Resources (Pty) Ltd.**

The characteristics, technology and extent of the project are defined in more detail here.

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PURPOSE OF THIS DOCUMENT

The main purposes of this background information document are:

- To provide information about the proposed project
- To explain the Environmental Impact Assessment (EIA) process
- To provide an opportunity for participation in the Environmental Impact Assessment (EIA) process

This document also indicates how you can receive information, or raise issues, which may be of concern and/or interest for interested and/or affected parties (I&AP's).

The sharing of information forms the basis of the public participation process and offers you the opportunity to become actively involved in the project from the outset.

Public participation plays an important role in the undertaking of an Environmental Impact Assessment (EIA) process, as input from I&AP's ensures all potential issues are considered within the study.

KEY FEATURES OF THE PROPOSED PROJECTS

In view of the growing electricity demand and in an effort to use renewable energy resources, **Palus Energy (Pty) Ltd, Miko Energy (Pty) Ltd and Nunki Energy (Pty) Ltd** are assessing the feasibility of Renewable Energy Generation Facilities consisting of the **construction, operation and maintenance of five Photovoltaic (PV) Power Plants with a maximum generation capacity up to 75 MW each**. The developed area (footprint) of each project will be **up to 210 ha**, to be selected following the indications of the specialist studies during the scoping phase and the outcomes of the public participation process.

Each of the five Photovoltaic (PV) Power Plants together with its connection infrastructures and structures will require the installation of the following equipment:

- Photovoltaic modules (monocrystalline, polycrystalline or thin-film solar modules)
- Mounting systems (fixed or single-axis horizontal trackers) for the PV arrays and related foundations
- Internal cabling and string boxes
- Medium voltage stations, hosting DC/AC inverters and LV/MV power transformers
- Medium voltage receiving station(s)
- Workshops & warehouses
- One small on-site high-voltage substation with high-voltage power transformers, stepping up the voltage to the voltage of the Eskom's grid (132 kV) and a 132 kV bus bar with metering and protection devices and a control building (the so called "switching station"), to be located within the PV plant development area
- Electrical system and UPS (Uninterruptible Power Supply) devices
- Lighting system

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- Grounding system
- Access road and internal roads
- Fencing of the site and alarm and video-surveillance system
- Water access point and water extraction on-site borehole(s) point, water supply pipelines, water treatment facilities
- sewage system (*Ballam Waterslot* or *Lilliput* system).

The five Solar Parks may be connected:

- a) to the **Eskom Hotazel substation**; and/or
- b) to the new **Eskom Hotazel - Umtu 132 kV power line**; and/or
- c) to the new **Eskom Umtu substation**.

Two power line corridors are proposed for the connection to the Eskom Hotazel substation / Eskom Hotazel - Umtu 132 kV double circuit / Eskom Umtu substation:

- **Corridor 1** to the **Eskom Hotazel substation**: the proposed 132 kV power line corridor will be approximately 16.3 km long and will run parallel to the existing Eskom “Hotazel - Heuningvlei” 132 kV power line.
- **Corridor 2** to the **new Eskom Umtu substation**: the proposed 132 kV power line corridor will be approximately 20.8 km long and will run parallel to the existing Eskom “Hotazel - Heuningvlei” 132 kV power line (for 14.8 km) and to the Eskom “Hotazel - Umtu” 132 kV power line (for 6.0 km).

Each project will have a dedicated circuit for the connection to the Eskom grid. All 5 circuits will run over the proposed Corridor 1 and/or Corridor 2 and will be called:

East 2 132 kV circuit; East 3 132 kV circuit; Rhodes 2 132 kV circuit; Bowden 1 132 kV circuit and Bowden 2 132 kV circuit.

In case of connection to the **Eskom Hotazel substation**: the PV Project’s 132 kV circuit will run within the **Corridor 1** and will connect the PV Project’s on-site high-voltage substation to a 132 kV feeder bay to be commissioned and equipped at the Eskom Hotazel substation.

In case of connection to the **Eskom Hotazel - Umtu 132 kV power line**: a **small switching station** will be built within the Corridor 1, next to the Eskom Hotazel - Umtu 132 kV power line, which will loop in and out of the 132 kV bus bar of the new switching station through **two new sections of 132 kV line approximately 100 m long**. The PV Project’s 132 kV circuit will run within the **Corridor 1** and will connect the PV Project’s on-site high-voltage substation to the 132 kV feeder bay of the new switching station.

In case of connection to the **Eskom Umtu substation**: the PV Project’s 132 kV circuit will run within the Corridor 2 and will connect the PV Project’s on-site high-voltage substation to a 132 kV feeder bay to be commissioned and equipped at the Eskom Umtu substation.

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The **Bowden 1 & Bowden 2 132 kV circuits** will start from Portion 1 of the farm Bowden 223 as 132 kV double circuit: two circuits mounted on the same power line structures.

The **Rhodes 2 132 kV circuit** will start from the Farm Rhodes 269 as single circuit / power line; the power line will become a double circuit from the Farm East 270, where the **East 3 132 kV circuit** will be added. Therefore the Rhodes 2 and East 3 circuits will be mounted on the same power line structures.

The **East 2 132 kV circuit** will share the same power line structures of the “East Power Line” (DEA Ref. 14/12/16/3/3/1/1426), previously proposed for the East Solar Park (DEA Ref. 14/12/16/3/3/2/664).

On the whole, **three new 132 kV power lines** (including the “East Power Line”, DEA Ref. 14/12/16/3/3/1/1426) will host **six 132 kV circuits** dedicated to 6 solar parks (including the “East Solar Park”, DEA Ref. 14/12/16/3/3/2/664).

The first power line (Bowden 1 & Bowden 2) will start from Portion 1 of the Farm Bowden 223; the second power line (Rhodes 1 and East 3) will start from the farm Rhodes 269; the third power line (East and East 2) will start from the Farm East 270.

Please refer to the locality map enclosed as **Annexure A1**, showing the preliminary locations of the new and already approved solar parks and of the two power line corridors.

The Corridor 2 may be used for the reinforcement of the Eskom grid in the area, by means of a **second 132kV power line linking the Hotazel substation to the Umtu substation**. In this respect, it should be noted that the Kudumane Manganese Resources (Pty) Ltd is currently assessing the feasibility of a new manganese mine to be located on the western side of the Farm Kipling 271 and/or on the Farm Umtu 281. Indeed they are the holders of prospecting rights over the Farm Kipling 271 and Farm Hotazel 280 and have already applied for mining rights. The Corridor 2, as well as the existing Eskom “Hotazel - Umtu” 132 kV power line, may potentially affect the future mine. During the scoping phase, an alternative path will be evaluated for Corridor 2 in consultation with Kudumane Manganese Resources (Pty) Ltd.

The new power lines will consist of a series of **steel or aluminium monopole structures** supporting the electrical cables (double circuit) and a communication cable, to be installed approximately 200 - 260 m apart. The proposed structures will be between 18 m and 25 m high and the basement of each pole will have a footprint of approximately 2.5 m².

Please refer to the drawing of the **Annexure A2**:

- **132 kV double circuit: Steel monopole structure**

Each power line servitude will be **36 m wide**: 18 m from each side of the centre line. The

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whole servitude will be **up to 108 m wide**. During the scoping phase, it will be evaluated if the 3 power lines (double circuit each) may be built closer each other, so that the overall servitude width can be smaller than 108 m.

If required, a **new access road (dirt road)** may be constructed within the power line servitude, for construction and maintenance activities.

The proposed 132 kV circuits may be built and/or operated by Palus Energy, Miko Energy, Nunki Energy and/or by Eskom.

The connection may also entail interventions on the Eskom grid, according to Eskom's connection requirements/solution.

During the construction phase, the sites may be provided with additional:

- water access points and water extraction on-site borehole(s), water supply pipelines, water treatment facilities;
- pre-fabricated buildings that will be removed at the end of the construction phase.

LOCATIONS

The **East 2 Solar Park** and **East 3 Solar Park** will be established on the **Remainder (964.2695 ha) and Portion 2 (856.5320 ha) of the Farm East 270, Kuruman RD**, 4 km North of Hotazel. The **Rhodes 2 Solar Park** will be established on the **Farm Rhodes 269, Kuruman RD (1810.8314 ha)**, 8 km North of Hotazel. The **Bowden 1 Solar Park** and **Bowden 2 Solar Park** will be established on **Portion 1 of the Farm Bowden 223, Kuruman RD (1223.3804 ha)**, 16 km North of Hotazel.

All the project sites are located North of Hotazel, in the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape Province.

Project sites - Surveyor-general 21 digit site codes:

C	0	4	1	0	0	0	0	0	0	0	0	2	2	3	0	0	0	0	1
C	0	4	1	0	0	0	0	0	0	0	0	2	6	9	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	2

The proposed power line corridors run over the following properties:

- Portion 1 of the Farm Bowden 223, Kuruman RD (Corridors 1 and 2);
- Remainder of the farm Bowden, 223, Kuruman RD (Corridors 1 and 2);
- Farm Rhodes, 269, Kuruman RD (Corridors 1 and 2);
- Remainder and Portion 2 of the Farm East 270, Kuruman RD (Corridors 1 and 2);

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- Farm Kipling 271, Kuruman RD (Corridors 1 and 2);
- Remainder of the farm Hotazel, 280 Kuruman RD (Corridors 1 and 2);
- Farm Umtu 281, Kuruman RD (Corridor 2); and
- Remainder of the Farm Olive Pan 282 Kuruman RD (Corridor 2).

all located in the Joe Morolong Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape Province.

Properties crossed by the power line corridors - Surveyor-general 21 digit site codes:

C	0	4	1	0	0	0	0	0	0	0	0	2	2	3	0	0	0	0	1
C	0	4	1	0	0	0	0	0	0	0	0	2	2	3	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	6	9	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	7	0	0	0	0	0	2
C	0	4	1	0	0	0	0	0	0	0	0	2	7	1	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	8	0	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	8	1	0	0	0	0	0
C	0	4	1	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	0

Access to the development areas will be from a secondary road (running from the provincial Road R31) running along the eastern boundaries of the project sites. New access roads will be constructed and will link this secondary road to the proposed Solar Parks.

The developed area (footprint) of each of the Solar Parks will be **up to 210 hectares** and will be selected following the indications of the specialist studies during the scoping phase and the outcomes of the public participation process.

The chosen sites are suitable for the installation of photovoltaic (PV) power plants. It is appropriate morphologically (flat terrain) and regarding the favourable radiation conditions. The available radiation allows a high rate of electric energy production, as a combination of the location (latitude-longitude) and climatic conditions.

See enclosed a **Locality Map** indicating the location of the project sites and of the power line corridors (**Annexure A1**).

THE NEED FOR SOLAR ENERGY FACILITIES

South Africa currently relies principally on fossil fuels (coal and oil) for the generation of electricity. At the present date, Eskom generates approximately 95% of the electricity used in South Africa. On the other hand, South Africa has a largely unexploited potential in renewable energy resources such as solar, wind, biomass and hydro-electricity to produce electricity as opposed to other energy types (fuel or coal).

South Africa's electricity supply still heavily relies upon coal power plants, whereas the

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current number of renewable energy power plants is very limited. In the last few years, the demand for electricity in South Africa has been growing at a rate approximately 3% per annum.

These factors, if coupled with the rapid advancement in community development, have determined the growing consciousness of the significance of environmental impacts, climate change and the need for sustainable development. The use of renewable energy technologies is a sustainable way in which to meet future energy requirements.

The development of clean, green and renewable energy has been qualified as a priority by the Government of South Africa with a target for 2013 of 10,000 GWh, as planned in the Integrated Resource Plan 1 (IRP1) and with the Kyoto Protocol. Subsequently the Department of Energy of South Africa (DoE) decided to undertake a detailed process to determine South Africa's 20-year electricity plan, called Integrated Resources Plan 2010-2030 (**IRP 2010**). The IRP1 (2009) and the IRP 2010 (2011, updated in March 2014) outline the Government's vision, policy and strategy in matter of the use of energy resources and the current status of energy policies in South Africa. In particular, the IRP 2010 highlights the necessity of commissioning 1200 MW with solar PV technology by the end of 2015.

In order to achieve this goal, the DoE announced a renewable energy IPP (Independent Power Producers) Procurement Programme.

The IPP Procurement Programme, issued on 3rd August 2011, envisages the commissioning of 3725 MW of renewable projects (1450 MW with solar photovoltaic technology) capable of beginning commercial operation before the end of 2017. The Department of Energy has already announced the intention to procure an additional **3,600 MW** of renewable energy projects by **2020** (DOE Media Statement of 12 December 2014). Therefore, the development of photovoltaic power plants will represent a key feature in the fulfilment of the proposed target goal and the reduction of CO₂ emissions.

The purpose of the proposed Solar Photovoltaic Plants is to add new capacity for the generation of renewable electric energy to the national electricity supply in compliance with the REIPP Procurement Programme and in order to meet the "sustainable growth" of the Northern Cape Province. The use of solar radiation for power generation is considered as a non-consumptive use and a renewable natural resource which does not produce greenhouse gas emissions. The generation of renewable energy will contribute to the growth of South Africa's electricity market, which has been primarily dominated up to this date by coal-based power generation. With specific reference to photovoltaic energy, and the proposed project, it is important to consider that South Africa has one of the highest levels of solar radiation in the world.

On a local level the Joe Morolong Local Municipality has three main nodes where relatively higher economic activity takes place, namely Vanzylsrus, Hotazel and Blackrock. The proposed Solar Parks are situated near Hotazel and Blackrock. It is stated in the Spatial

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Development Framework of the Municipality that investment should be focused on these areas to expand the node into a more diverse economic centre. It is mentioned that a replacement economic activity should be found when the mineral resources are depleted for Hotazel and Blackrock. The proposed renewable energy projects will contribute towards meeting this goal by introducing new economic activity and job opportunities to the area through the development of the proposed PV Solar Plants

The aim of the Solar Parks (along with the already approved East Solar Park and Rhodes 1 Solar Park) is to help Eskom to supply the existing and future loads arising from:

- the **Kalagadi Manganese Mine**, supplied from the Eskom Umtu substation;
- the **Hotazel mine**, supplied from the Eskom Hotazel substation;
- the **Gloria Mine**, supplied from the Eskom Hotazel substation;
- the **Kudumane Manganese Mine**, supplied from the Eskom Hotazel substation;
- the **N' Chwaning mine**, supplied from the Eskom Klipkop substation via the Eskom Hotazel and Umtu substations;
- the **Wessels mine**, supplied by the Eskom Wessels substation via the Eskom Hotazel and Umtu substations.

The proposed solar parks will assist the Eskom grid to meet the high energy demand related to the mining activities conducted in the area. Furthermore, being renewable energy projects which doesn't generate greenhouse gases - it will assist to compensate the greenhouse gas emissions arising from these mining activities.

Due to the expected increase of the energy demand arising from the current and future mining activities in the Hotazel area, Eskom will upgrade the Hotazel distribution substation at 400 kV. The Hotazel substation is planned to become a transmission substation from 2020 and will be connected to the Eskom Mookodi and Ferrum substations at 400 kV.

This Eskom integration project is called "**Kimberley Strengthening Phase 3**" and it entails the following interventions affecting the Hotazel area:

- Hotazel 400/132 kV substation (1st and 2nd 500 MVA 400/132 kV transformers)
- Hotazel 400 kV loop-in (Ferrum-Mookodi (Vryburg) 2nd 400 kV line)
- Hotazel Ext. 132 kV 1st 36 MVar capacitor".

Please refer to the last **Transmission Development Plan 2015-24** published on the Eskom website.

The local generation in the Hotazel area by means of e.g. new solar plants like the proposed Photovoltaic Power Plants will help Eskom to meet the increase of the local supply demand without the urgent need of huge interventions on the network aimed to import the energy from other provinces / areas. Furthermore, the electricity tariff proposed by Eskom to the mines may be reduced wherever the energy is produced locally at a competitive price (this is also the aim of the proposed Solar Parks).

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FUNCTIONING OF A PHOTOVOLTAIC (PV) POWER PLANT

Solar energy facilities such as those using PV technology use the energy from the sun to generate electricity through a process known as Photovoltaic Effect, which consists in the generation of electrons by photons of sunlight in order to create electrical energy.

The PV plant will mainly consist of the following components:

- **Photovoltaic cells and photovoltaic modules:** PV cells are made in silicone and act as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic module. The facility will use **thin-film** or **mono/polycrystalline photovoltaic (PV) modules** with high efficiency.
- **Support structures:** PV modules will be assembled on steel or aluminium frames. The preferred technical solutions for the proposed solar park entails PV modules mounted on **single-axis horizontal trackers** (alternative option 1) or on **fixed mounting systems** (alternative option 2), or a combination of both of them. As depicted in Figures 1 and 2, each tracker is composed by several PV arrays North-South oriented and linked by a horizontal axis, driven by a motor. The horizontal axis allows the rotation of the PV arrays toward the West and East direction, in order to follow the daily sun path. In the case of fixed mounting systems, as depicted in Figures 3 and 4: each mounting frame hosts PV modules along parallel rows of PV modules placed side by side, with the position of the panels northwards and an optimized tilt angle (between 20° and 30°). The rows of PV modules are mounted horizontally one on top of the other, with an overall mounting structure height up to 3.1 meters above ground level.
- **Strings and string boxes:** the PV modules are connected in series in order to form PV strings, so that the string voltage fits into the voltage range of the DC/AC inverters. PV strings are devised in order to be connected to DC-connection boxes (string boxes) with a parallel connection solution (PV sub-field). String Boxes monitor the currents in photovoltaic modules and can promptly diagnose faults. String boxes are also designed with a general circuit breaker in order to disconnect the photovoltaic sub-fields from the DC/AC inverters.
- **Medium-voltage stations:** each medium-voltage station is designed to host one or more DC/AC inverters, and one or more medium-voltage power transformers. The DC/AC inverters are deemed to convert the direct current (DC) to alternating current (AC) at low voltage; subsequently the AC will pass through a medium-voltage power transformer in order to step-up the voltage up to 22 kV.
- **Medium-voltage receiving station:** the energy from the medium voltage stations will be collected into one medium voltage receiving stations, linking in parallel all the PV fields of the PV generator.

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- **On-site high-voltage substation:** from the medium-voltage receiving station, the electrical energy will be delivered to one small on-site high-voltage substation with two or more high-voltage power transformers (one as spare), stepping up the voltage to the voltage of the Eskom grid. Furthermore, the on-site high-voltage substation will be equipped with a control building and one busbar with metering and protection devices (also called “switching station”).

The five Solar Parks may be connected:

- a) to the **Eskom Hotazel substation**; and/or
- b) to the new **Eskom Hotazel - Umtu 132 kV power line**; and/or
- c) to the new **Eskom Umtu substation**.

Each projects will have a dedicated circuit for the connection to the Eskom grid. All the 5 circuits will run over the proposed Corridor 1 and/or Corridor 2.

In case of connection to the **Eskom Hotazel substation**: the PV Project’s 132 kV circuit will run within the **Corridor 1** and will connect the PV Project’s on-site high-voltage substation to a 132 kV feeder bay to be commissioned and equipped at the Eskom Hotazel substation.

In case of connection to the **Eskom Hotazel - Umtu 132 kV power line**: a **small switching station** will be built within the Corridor 1, next to the Eskom Hotazel - Umtu 132 kV power line, which will loop in and out of the 132 kV bus bar of the new switching station through **two new sections of 132 kV line approximately 100 m long**. The PV Project’s 132 kV circuit will run within the **Corridor 1** and will connect the PV Project’s on-site high-voltage substation to the 132 kV feeder bay of the new switching station.

In case of connection to the **Eskom Umtu substation**: the PV Project’s 132 kV circuit will run within the Corridor 2 and will connect the PV Project’s on-site high-voltage substation to a 132 kV feeder bay to be commissioned and equipped at the Eskom Umtu substation.

Other key features of the project are to ensure a high level of reliability, operational and maintenance safety, low water consumption. The expected operational life of the plant is deemed of approximately 25-30 years. The construction and the commissioning of each PV plant are expected to last **maximum 15 months**, while the power line will be built in 5 months.

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Figure 1 Simulation views of the PV arrays mounted on horizontal 1-axis tracker

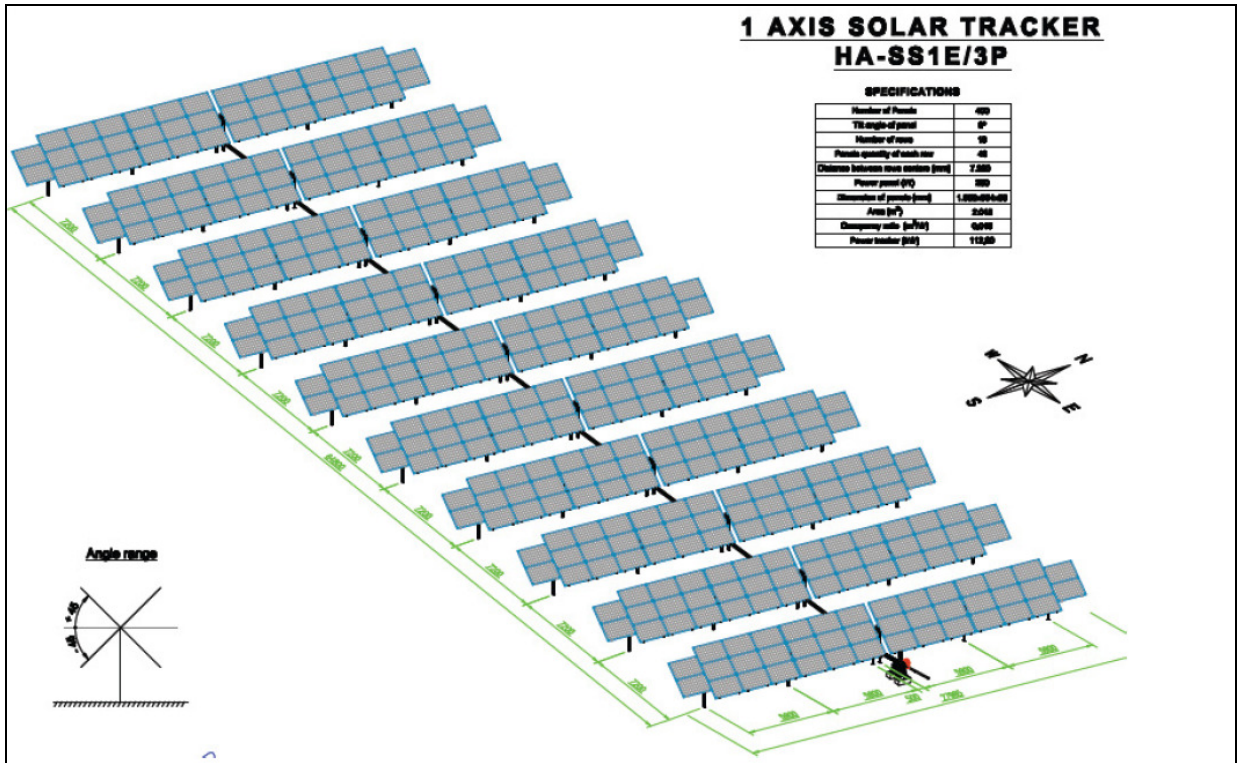


Figure 2 Frontal views of the PV arrays mounted on horizontal 1-axis tracker



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Figure 3 Lateral views of PV arrays mounted on fixed mounting systems

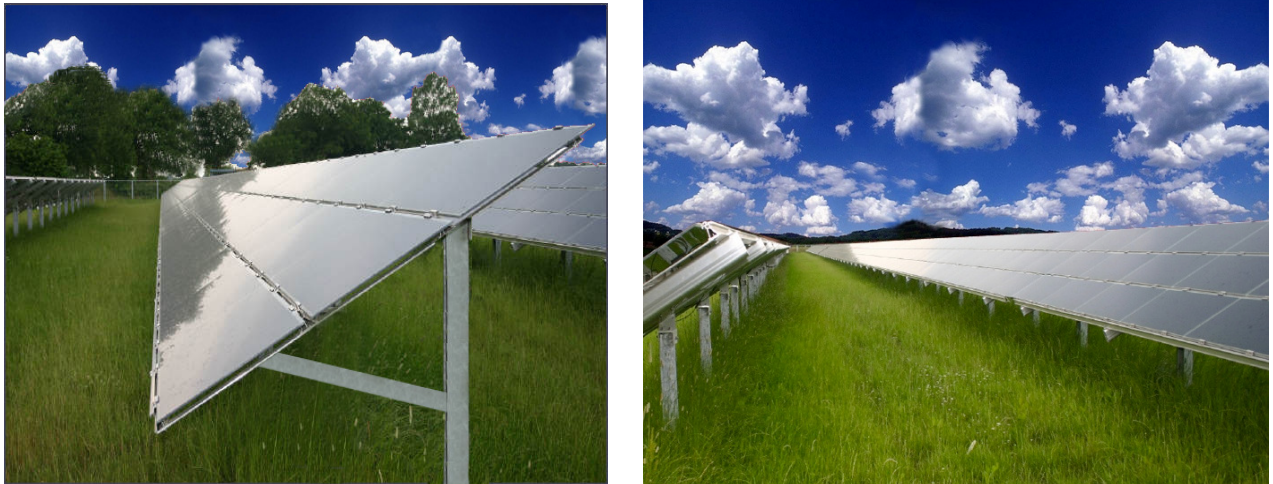


Figure 4 Frontal view of PV arrays mounted on fixed mounting systems



ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

In order to undertake the construction of the proposed PV plants, Palus Energy, Nunki Energy and Miko Energy must receive environmental authorizations (one for each project) granted from the National Department of Environmental Affairs (DEA), under the terms of the **EIA Regulations, 2014** published on 4 December 2014 in terms of Section 24(5) and 44 of the National Environmental Management Act (NEMA, Act No. 107 of 1998). The environmental authorizations shall be granted in consultation with the **Northern Cape Department of Environment and Nature Conservation (DENC)**.

The Environmental Impact Assessment (EIA) process permits the identification and assessment of potential environmental impacts resulting from the proposed projects.

Palus Energy, Nunki Energy and Miko Energy will undertake the required Environmental

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Impact Assessment (EIA) process and appointed **AGES (Pty) Ltd** as Environmental Assessment Practitioner (EAP) in order to identify and assess potential environmental impacts, proposing appropriate mitigation and management measures as part of an Environmental Management Programme. This process gives also the opportunity to dialogue with interested and affected parties through a public participation process. Therefore, during the entire Environmental Impact Assessment (EIA) process, I&AP's will be actively and constantly involved. The main environmental studies will be the following:

- Draft Scoping Report
- Final Scoping Report
- Draft EIA Report
- Final EIA Report
- Draft Environmental Management Programme

POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECTS

A series of preliminary significant environmental issues and potential environmental impacts are currently being investigated and evaluated in terms of the severity, duration, extent, frequency and probability during the construction and the operational phases. The methods to be used are internationally recognised and based on facts, experience and expert opinions. The following preliminary issues and potential impacts are being evaluated during the Environmental Impact Assessment (EIA) process:

- Impacts on avifauna;
- Impacts on vegetation and fauna;
- Impacts on the agricultural potential of the soils;
- Geological, soil and erosion impacts;
- Impacts on heritage resources;
- Visual impact;
- Social and economic impacts.

During the Scoping Phase, specialists will identify the abovementioned potential environmental issues and impacts for further investigation within the subsequent EIA Phase. Specialist studies will be conducted in order to identify all potentially significant impacts. These impacts will be all analysed singularly and cumulatively in order to exclude the risk of fatal flaws and potential threats, if any, as well as to recommend adequate and effective mitigation measures.

The Draft and Final Scoping Reports will highlight areas that should be avoided in order to limit potential impacts, and will recommend the most favourable alternatives for the PV plants and the associated infrastructure and structures for further investigation in the Draft and Final EIA Reports.

The public participation process will provide valuable information in the identification of

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further issues which may require further and specific investigation and analysis during the Environmental Impact Assessment process.

AGES will give response to all comments and queries received from I&AP's, and will carefully consider and evaluate all issues raised with the aim of assessing all potential impacts.

PUBLIC PARTICIPATION PROCESS

It is important that all relevant I&AP's are identified and involved in the public participation process from the beginning of the project. The public participation process gives the chance to become actively involved through constant sharing of information related to the projects.

The main purposes of the public participation process are to ensure that:

- all relevant information in respect of the application is made available to I&AP's for their evaluation and review;
- reasonable opportunity is given to I&AP's to comment and to submit queries related to the proposed projects;
- a review period is provided for interested and affected parties to comment on findings of the Draft and Final Scoping Reports and Draft and Final EIA Reports.

The public participation process includes the following phases:

- phase 1: advertising of the Environmental Impact Assessment process (regional and local press);
- phase 2: registration of I&AP's and key stakeholders on the database (on-going);
- phase 3: consultation with and transfer of information to I&AP's through consultation, public meetings, focus group meetings and key stakeholder workshops;
- phase 4: registration of all comments, issues and concerns raised by I&AP's within an issues registry, which will form an integral part of Scoping and EIA Reports;
- phase 5: invitation of I&AP's to comment the Scoping and EIA Reports within the stipulated 30-day review period.

The public involvement within the phases of an Environmental Impact Assessment process includes:

1. Notification of Environmental Impact Assessment process

- a) Application form sent to Department of Environmental Affairs
- b) Advertising in local and/or regional newspapers
- c) Inform I&AP's and stakeholders through site notices, background information documents & stakeholders letters

2. Draft Scoping Report

- a) Draft Scoping Report sent to I&AP's and stakeholders
- b) Draft Scoping Report submitted to the Department of Environmental Affairs
- c) Collection of comments from I&AP's and stakeholders

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- d) Comments from the Department of Environmental Affairs

3. Final Scoping Report

- a) Final Scoping Report sent to I&AP's and stakeholders
- b) Final Scoping Report submitted to the Department of Environmental Affairs
- c) Approval of the Final Scoping Report by the Department of Environmental Affairs

4. Draft EIA Report and Draft Environmental Management Programme

- a) Draft EIA Report and Draft Environmental Management Programme sent to I&AP's and stakeholders
- b) Draft EIA Report and Draft Environmental Management Programme submitted to the Department of Environmental Affairs
- c) Collection of comments from I&AP's and stakeholders
- d) Comments from the Department of Environmental Affairs

5. Final EIA Report and Draft Environmental Management Programme

- a) Final EIA Report and Draft Environmental Management Programme sent to I&AP's and stakeholders
- b) Collection of comments from I&AP's and stakeholders
- c) Final EIA Report and Draft Environmental Management Programme submitted to the Department of Environmental Affairs

6. Decision Making

- a) Acknowledge receipt of Final EIA Report and Draft Environmental Management Programme
- b) Accept or Reject of Final EIA Report and Draft Environmental Management Programme
- c) To Grant or Refuse Environmental Authorization
- d) Notification of decision
- e) Information of stakeholders & I&AP's of decision in writing.

RIGHTS AND RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations of 2014, please take note of your rights and responsibilities as an I&AP.

In order to participate in this Environmental Impact Assessment process as an I&AP, you must register yourself on the project database.

Please observe that all comments regarding the proposed project have to be submitted within the stipulated timeframes.

Finally, please be advised that as an I&AP you are required to disclose any direct business, financial, personal or other interest which that you may have in the approval or reject of the application for the proposed project.

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PRELIMINARY TIME SCHEDULE

Initial Public participation process	July 2015
Submission of Draft Scoping Report	August 2015
Submission of Final Scoping Report	October 2015
Submission of Draft EIA Report and Draft EMPr	November 2015
Submission of Final EIA Report and Draft EMPr	January 2016

WHO TO CONTACT

AGES (Pty) Ltd

Mr. J.H. Botha / Ms. E. Grobler

Tel: 015 2911577 / Fax: 015 2911577

Physical Address: 120 Marshall Street, Polokwane, 0699, South Africa

Postal Address: P.O. Box 2526, Polokwane, 0700, South Africa

E-mails: jbotha@ages-group.com / egrobler@ages-group.com

Please contact Mr. Botha and/or Ms. Grobler at the above indicated numbers and addresses. Please complete the enclosed response form and return it to the above indicated numbers and addresses.

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RESPONSE FORM

EAST 2 SOLAR PARK, EAST 3 SOLAR PARK, RHODES 2 SOLAR PARK, BOWDEN 1 SOLAR PARK, BOWDEN 2 SOLAR PARK AND 132 kV POWER LINES

CONTACT DETAILS:

Title:

First Name:.....

Surname:.....

E-mail:

Cell:

Telephone:

Fax:

Organization (if applicable):

Capacity (e.g. Chairperson, member, etc.):

Physical Address:.....

Town: **Code:**

Postal Address:.....

Town: **Code:**

YOUR INTEREST IN THE MATTER:

1. What is your main area of interest with regards to the proposed project?
.....
.....

2. Are there any concerns you would like to raise, at this stage, regarding the proposed project?
.....
.....

3. Are there any additional role-players whom we should involve in the process?
If **“yes”**, please provide us with their contact details (Name, address & telephone numbers):
.....
.....

DATE: _____

SIGNATURE _____

