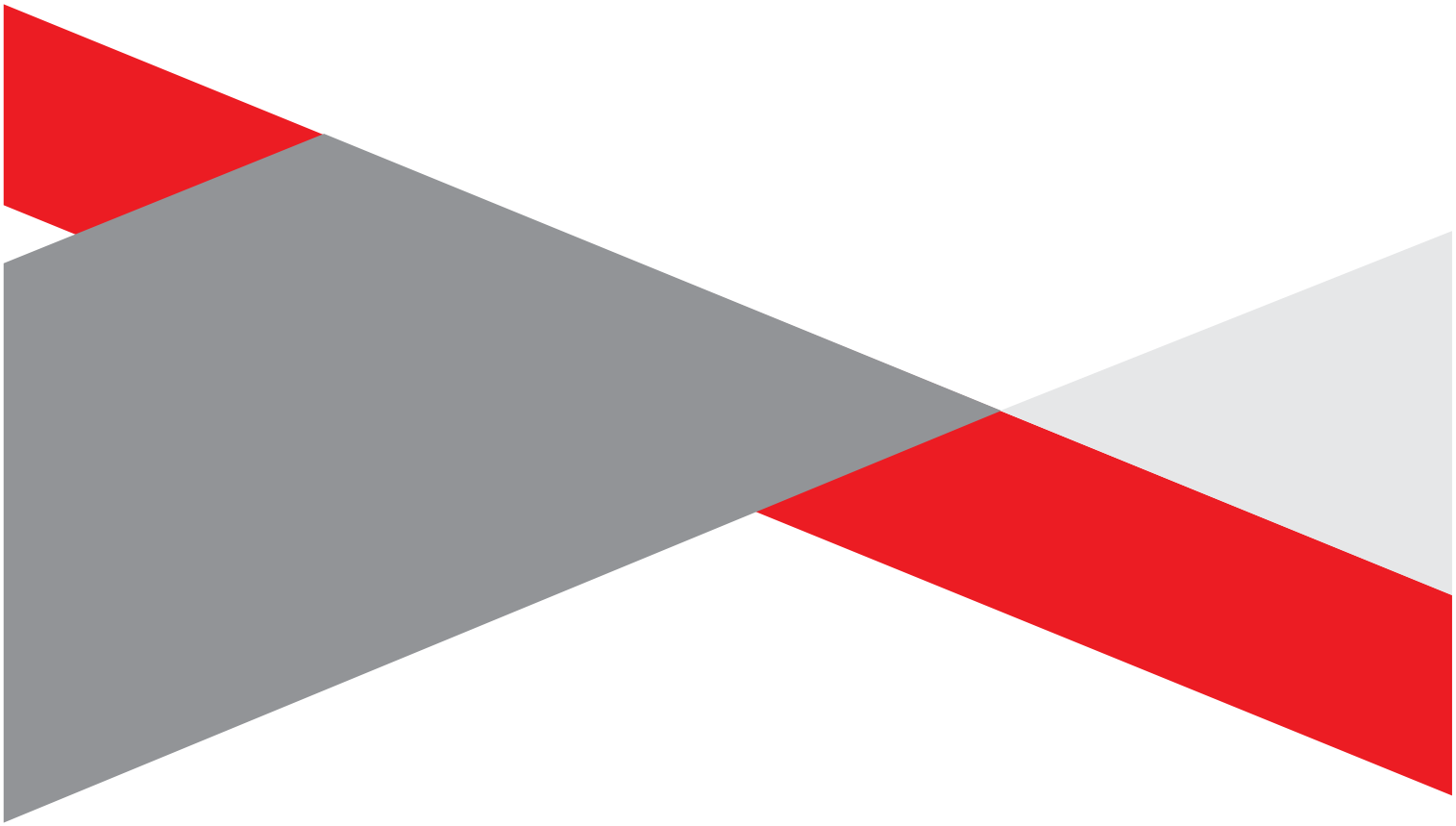
APPENDIX C3

BACKGROUND INFORMATION DOCUMENT



savannah environmental

BACKGROUND INFORMATION DOCUMENT (BID)

MAY
2022

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

PROPOSED DEVELOPMENT OF THE UMMBILA EMOYENI RENEWABLE ENERGY WIND AND SOLAR PV FACILITIES, AND GRID CONNECTION INFRASTRUCTURE

MPUMALANGA PROVINCE

Emoyeni Renewable Energy Farm (Pty) Ltd proposes the development of a cluster of renewable energy facilities and associated infrastructure, including grid connection infrastructure and battery energy storage, ~6km southeast of Bethal and ~1km east of Morgenzon in the Mpumalanga Province. The cluster of renewable energy facilities (to be known as the Ummbilla Emoyeni Renewable Energy Farm) consists of an up to 666MW wind farm, and 150MW solar PV facility. The grid connection infrastructure for both facilities will include a 400/132kV Main Transmission Substation (MTS), to be located between Camden and SOL Substations, which will be looped in and out of the existing Camden-Sol 400kV transmission line.

Each renewable energy facility will be constructed as a separate stand-alone project and therefore, separate Scoping and Environmental Impact Assessment (S&EIA) processes will be undertaken for each of the renewable energy facilities. Similarly, the grid connection solution will be subjected to a separate EIA process. Due to the proximity of the renewable energy facilities and their associated grid connection solution to one another, the public participation processes for the projects will be undertaken concurrently, providing the public with an opportunity to understand and provide comment on all the projects.

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 renewable energy facilities which form part of the cluster, and their associated grid connection solution.
- An overview of the Scoping and Environmental Impact Assessment (EIA) processes and specialist studies being undertaken to assess the renewable energy facilities and their associated grid connection solution.
- Details of how you can become involved in the S&EIA processes, receive information, or raise comments that may concern and/or interest you.

OVERVIEW OF THE PROJECTS

The Ummbilla Emoyeni Renewable Energy Farm, including the project names, infrastructure details, properties affected by the proposed facilities, grid connection and associated infrastructure are described in the sections below:

WIND FARM

A wind farm with a contracted capacity of up to 666MW is proposed to accommodate the following infrastructure:

- Up to 111 wind turbines with a maximum hub height of up to 200m. The tip height of the turbines will be up to 300m.
- 3 x 33kV/132kV onsite collector substation.
- Battery Energy Storage System (BESS).
- Cabling between turbines, to be laid underground where practical.
- Laydown and Operations and Maintenance (O&M) hub (approximately 300m x 300m):
  - Batching plant of up to 4ha to 7ha.
  - 3 x O&M office of approximately 1.5ha each.
  - 3 x construction compound, including site office of 3ha each (150m x 200m each).
- Laydown and crane hardstand areas (approximately 75m x 120m).
- Access roads of 12 -13m wide, with 12m at turning circles.

SOLAR PV FACILITY

The solar PV facility, with a contracted capacity of up to 150MW, is proposed to accommodate the following infrastructure:

- PV modules and mounting structures with a capacity per panel of 350W to 450W and dependent on optimisation and cost.
- Inverters and transformers.
- 33kV/132kV onsite collector substation.
- Battery Energy Storage System (BESS).
- Cabling between project components.
- Laydown and O&M hub (approximately 300m x 300m):
  - Construction compound (temporary).
  - Maintenance office.
- Access roads (up to 12m wide) and internal distribution roads.

GRID CONNECTION INFRASTRUCTURE

The grid connection solution comprises a 400/132kV MTS, to be located on a site between Camden and SOL Substations, which will be looped in and out of the existing Camden-Sol 400 kV line . The location of the MTS will be refined through an ongoing process of communication with Eskom Planning but will be within close proximity to the 400kV line in order to cut into this line. The size of the MTS will likely be 600m x 600m as per Eskom requirements.

PROPERTY DETAILS

A preferred project focus area (refer to Figure 1), with an extent of 27 819ha, has been identified by Emoyeni Renewable Energy Farm (Pty) Ltd as a technically suitable area for the development of the Ummbilla Emoyeni Renewable Energy Farm. The layout and project capacity will be confirmed as the EIA process proceeds and environmental constraints are identified.

The project site is located across the Govan Mbeki, Lekwa, and Msukaligwa Local Municipalities within the Gert Sibande District Municipality. The project site comprises the following farm portions:

Parent Farm Number	Farm Portions
Farm 261 – Naudesfontein	15, 21
Farm 264 – Geluksplaats	0, 1, 3, 4, 5, 6, 8, 9, 11, 12
Farm 268 – Brak Fontein Settlement	6,7,10,11,12
Farm 420 – Rietfontein	8,9,10,11,12,15,16,18,19,22,32
Farm 421 - Sukkelaar	2, 2, 7, 9, 9 10, 10 11, 11 12, 12, 22 ,25, 34, 35, 36, 37, 37, 38, 39, 40, 42, 42
Farm 422 – Klipfontein	0, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23
Farm 423 – Bekkerust	0, 1, 2, 4, 5, 6, 10, 11, 12, 13 14, 15, 17, 19, 20, 22, 23, 2425
Farm 454 – Oshoek	4, 13, 18
Farm 455 – Ebenhaezer	0, 1, 2, 3
Farm 456 – Vaalbank	1, 2, 3, 4, 7, 8, 13, 15, 16, 17, 18, 19
Farm 457 – Roodekrans	0, 1, 4, 7, 22, 23, 23
Farm 458 – Goedgedacht	0, 2, 4, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 21, 22, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 37, 39
Farm 467 – Twee Fontein	0, 1, 4, 5, 6, 7, 8, 10
Farm 469 – Klipkraal	5, 6, 7, 8
Farm 548 – Durabel	0

OVERVIEW OF POWER GENERATION TECHNOLOGIES PROPOSED

WIND ENERGY TECHNOLOGY

Wind turbines use the energy from the wind to generate electricity. A wind turbine consists of four large main components:

- The rotor.
- The nacelle.
- The tower.
- The foundation unit.

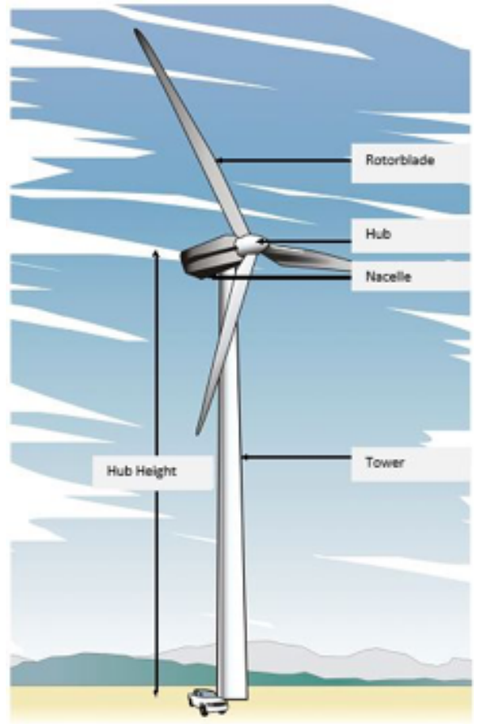


Figure 2: Main components of a wind turbine

The mechanical power generated by the rotation of the blades is transmitted to the generator within the nacelle via a gearbox and drive train. The wind turns the blades, which in turn spin a shaft which connects to a generator and generates electricity. The use of wind for electricity generation is essentially a non-consumptive use of a natural resource and produces zero greenhouse gas emissions.

Turbines are able to operate at varying speeds. The amount of energy a turbine can harness depends on both the wind velocity and the length of the rotor blades. The turbines being considered for use at the wind farm will be between 6MW and 15MW in capacity. The turbines will have a hub height of up to 200m, with a tip height of up to 300m.

Various wind turbine designs and layouts on the project site are being considered by the developer in order to maximise the generating capacity of the site while minimising environmental impacts. The final facility layout, turbine capacities and models will be dependent on what is deemed suitable for the project site in relation to, among other things, further studies of the wind regime, terrain, and environmental constraints and social sensitivities.

The length of the construction period for the wind farm is estimated to be approximately 24 months. A turbine is designed to operate continuously, with low maintenance for 20 to 25 years.

SOLAR PV TECHNOLOGY

Solar energy facilities use energy from the sun to generate electricity through a process known as the **Photovoltaic Effect.** This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity. The solar fields of the PV facilities will comprise the following components:

Photovoltaic Cells:

A photovoltaic (PV) cell is made of silicone that acts as a semiconductor used to produce the photovoltaic effect. PV cells are arranged in multiples/arrays and placed behind a protective glass sheet to form a PV panel. Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)).

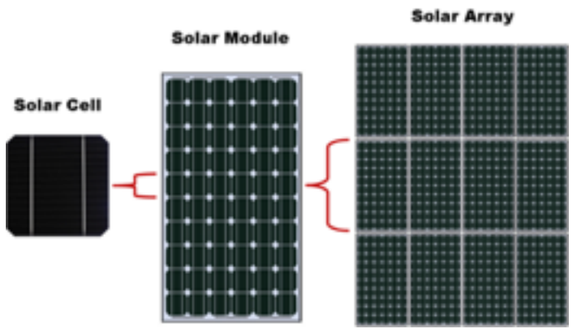


Figure 3: Overview of a PV cell, module and array/panel (Source: pveducation.com)

A solar PV module is made up of individual solar PV cells connected together, whereas a solar PV array is a system made up of a group of individual solar PV modules electrically wired together to form a much larger PV installation. The PV panels will be fixed to support structures to maximise exposure to the sun.

Inverters

Inverters are used to convert electricity produced by the PV cells from Direct Current (DC) into Alternating Current (AC) to enable the facility to be connected to the national electricity grid. Numerous inverters will be arranged in several arrays to collect and convert power produced by the facilities.

The length of the construction period for the PV facility is estimated to be approximately 12 to 18 months. PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance.

Support Structures

PV panels will be fixed to support structures. PV panels can either utilise fixed / static support structures, or alternatively they can utilise single or double axis tracking support structures. PV panels which utilise fixed / static support structures are set at an angle (fixed-tilt PV system) so as to optimise the amount of solar irradiation received. With fixed / static support structures the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.

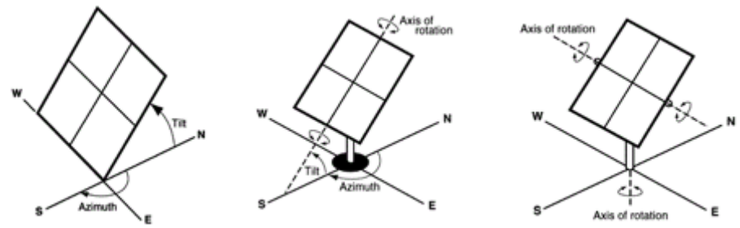


Figure 4: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com).

PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance.

BATTERY ENERGY STORAGE SYSTEM (BESS)

The need for a BESS stems from the fact that electricity is only produced by the Renewable Energy Facility while the wind or solar resource is available, while the peak demand may not necessarily occur during the daytime or as the resource is available. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

- Store and integrate a greater amount of renewable energy from the Wind Farm and Solar PV facility into the electricity grid.
- This will assist with the objective to generate electricity by means of renewable energy to feed into the National Grid which will be procured under either the Renewable Energy Independent Power Producer Procurement Program (REIPPPP) other government run procurement programmes or for sale to private entities if required.
- Proposed footprint of battery storage area: 2 – 3ha, within the footprint of the collector substation.
- Proposed capacity of battery storage: 200 - 800MWh.
- Proposed technology to be used: Lithium-ion batteries (LFP/NMC or others) (Li-Ion), Lithium capacitors/Electrochemical capacitors (LiC), and/or Redox-flow batteries (RFB)
- Battery types to be considered: Solid State Batteries and Redox Flow Batteries.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In accordance with the EIA Regulations, 2014 (as amended) published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), the applicant requires Environmental Authorisation (EA) from the National Department of Forestry, Fisheries and the Environment (DFFE), in consultation with the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), for the development of the proposed projects. In terms of Section 24(5) of NEMA, the EIA Regulations 2014 (as amended) and Listing Notices (GNR 327, GNR 325, and GNR 324), the applications for EA for the wind farm, solar PV facility, and their associated grid connection solution are subject to the completion of Scoping/EIA processes. Each application is required to be supported by comprehensive, independent environmental studies undertaken in accordance with the EIA Regulations, 2014 (as amended).

An EIA is an effective planning and decision-making tool. It allows for potential environmental consequences resulting from a proposed activity to be identified and appropriately managed during the construction, operation, and decommissioning phases of development. It also provides an opportunity for the project applicant to be forewarned of potential environmental issues and allows for the resolution of issue(s) identified and reported on as part of the EIA process, as well as provides opportunity for dialogue with key stakeholders and Interested and Affected Parties (I&APs).

Savannah Environmental has been appointed as the independent environmental consultant responsible for managing the separate applications for EA and undertaking the supporting EIA process required to identify and assess potential environmental impacts associated with the projects detailed above, as well as propose appropriate mitigation and management measures to be contained within the Environmental Management Programmes (EMPrs).

WHAT ARE THE POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECTS?

The projects will be assessed by independent environmental specialists to identify the potential for environmental impacts. Specialist studies that are proposed as part of the EIA processes include the following:

- **Biodiversity Impact Assessment** – includes ecology, fauna and flora and assesses the potential impact and the associated disturbance of vegetation on the biodiversity of the area (including critical biodiversity areas and broad-scale processes).
- **Wetland and freshwater Impact Assessment** – includes an assessment of impacts and associated disturbance to drainage lines, rivers, and wetlands at a broad and fine scale.
- **Avifauna Impact Assessment** – includes pre-construction monitoring in terms of the relevant guidelines for wind and solar developments and assesses the impact on sensitive avifaunal species, avifaunal habitats and sensitive species.
- **Bat Impact Assessment** – includes pre-construction monitoring in terms of the relevant guidelines for wind developments and assesses the impact on sensitive bat species, bat habitats and sensitive species.
- **Soils and Agricultural Potential Assessment** – includes consideration of land types and assesses the significance of loss of agricultural land and soil degradation and/or erosion.
- **Heritage Impact Assessment (Archaeology and Palaeontology)** – which includes archaeology and palaeontology and assesses the potential of disturbance to or destruction of heritage sites and fossils during the construction phase through excavation activities and as a result of visual impacts during the operation phase.
- **Visual Impact Assessment** – which includes the visual quality of the area and assesses the impact of the wind and solar PV facilities and the grid connection solution on the aesthetics within the area.
- **Noise Impact Assessment** – includes identification of sensitive noise receptors within the area and assesses the significance of noise from the wind farm during construction and operation.

» **Social Impact Assessment** – which assesses the positive and negative social impacts associated with the projects.
» **Traffic Impact Assessment** – assesses the impact of the developments on traffic and road networks in the area.

Site-specific studies will be undertaken to assess the potential impact of the proposed development, in order to delineate areas of sensitivity within the affected farm portions, assess impacts associated with the projects and make recommendations regarding avoidance, management and mitigation of impacts. Studies will be informed by available information and detailed field investigations undertaken in accordance with the relevant guidelines and protocols. Once the constraining environmental factors have been determined, the layouts for the proposed facilities and grid connection infrastructure can be determined and presented in the EIA reporting.

PUBLIC PARTICIPATION PROCESS

The sharing of information forms the basis of the public participation process and offers I&APs the opportunity to become actively involved in the EIA processes. Comments and inputs from I&APs are encouraged in order to ensure that potential impacts are considered throughout the EIA processes. The public participation process aims to ensure that:

» Information containing all relevant facts in respect of the applications are made available to I&APs for review.
» I&AP participation is facilitated in such a manner that they are provided with reasonable opportunity to comment on the proposed projects.
» Adequate review periods are provided for I&APs to comment on the findings of the Scoping and EIA Reports.

In order to ensure effective participation, the public participation processes include the following:

» Identifying I&APs, including affected and adjacent landowners and occupiers of land, and relevant Organs of State, and recording details within a database.
» Notifying registered I&APs of the commencement of the EIA processes and distributing the Background Information Document (BID).
» Providing access to registered parties to an online stakeholder engagement platform, which centralises project information and stakeholder input in a single digital platform.
» Providing an opportunity for registered I&APs and stakeholders to engage with the project team.
» Placing site notices at the affected properties and in the study area.
» Placing an advertisement in a local newspaper and using a local radio station (where available) to provide details of the EIA process and the availability of reports for public review and comment.
» Notifying registered I&APs of the release of the Reports for review and comment, meetings to be held and the closing dates by which comments must be received.
» Providing an opportunity to engage with the project team via appropriate virtual platforms or telephone.

YOUR RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations, 2014 (as amended) and the Public Participation Guidelines, 2017, your attention is drawn to your responsibilities as an I&AP:

» To participate in the EIA processes and provide comments on reports, you must register yourself on the I&AP database.
» You are required to disclose any direct business, financial, personal, or other interest that you may have in the approval or refusal of the applications.
» You must ensure that any comments regarding the proposed projects are submitted to the relevant consultant/s within the stipulated timeframes.

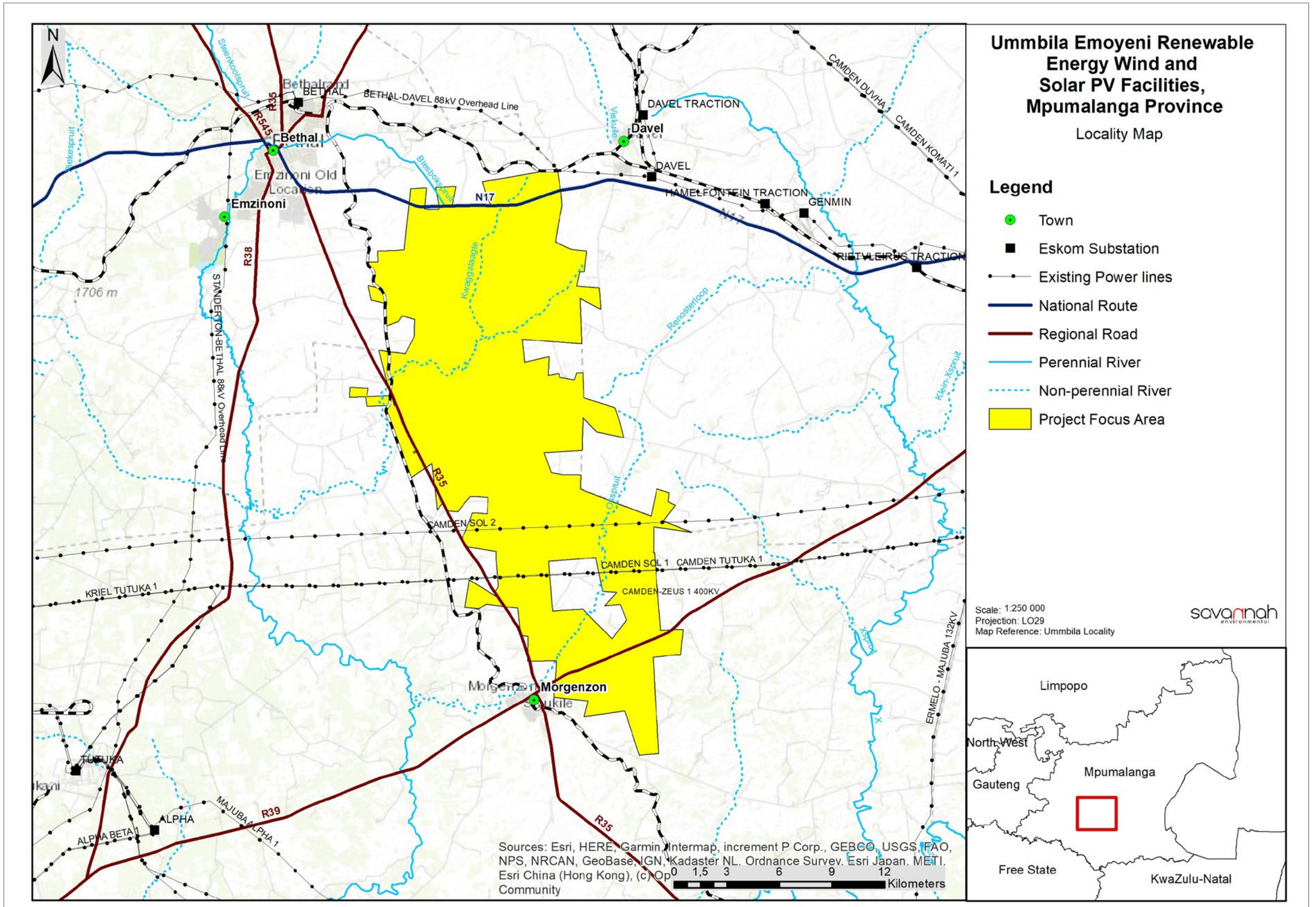
HOW TO BECOME INVOLVED

» By responding by phone, fax, or e-mail to the invitation for your involvement.
» By returning the reply form to the relevant contact person.
» By engaging with the project team during the EIA processes.
» By contacting the public participation and/or environmental consultant with queries or comments.
» By reviewing and commenting on the reports within the stipulated review and comment periods.

If you consider yourself an I&AP for the proposed projects, we urge you to make use of the opportunities created by the public participation process to provide comment, raise issues and concerns which affect and / or interest you, or request further information. Your input forms a key element of the EIA processes.

By completing and submitting the accompanying reply form, you automatically register yourself as an I&AP for the proposed projects, and are ensured that your comments, concerns, or queries raised regarding the projects will be noted. Please note that all comments received will be included in the project documentation. This may include personal information.

Figure 1: Locality Map



COMMENTS AND QUERIES

Direct all comments, queries or responses to:

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