SOCIAL ASSESSMENT

BASELINE SCOPING REPORT

MAKOPPA SOLAR PV FACILITY

LIMPOPO PROVINCE

APRIL 2025

Prepared

By

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EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

Cape EAPrac was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed Makkopa Solar PV located approximately 40 km south of Louis Trichardt in the Limpopo Province. The site is located within the Makhado Municipality (MM) in the Vhembe District Municipality (VDM). The Makkopa Solar PV is one of four projects that make up the Tabor Solar PV Cluster. Separate EIAs are being undertaken for each facility and the associated grid connection.

Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an EIA process. This report contains the findings of the Scoping Level SIA for the Makkopa Solar PV.

SUMMARY OF KEY FINDINGS

The key findings of the study are summarised under the following sections:

- Fit with policy and planning.
- Construction phase impacts.
- Operational phase impacts.
- Cumulative impacts.
- Decommissioning phase impacts.
- No-development option.

The findings of the Social Baseline Scoping Report are based on a review of relevant documents and the authors experience with undertaking SIAs for several renewable energy projects throughout South Africa, including the Limpopo Province. The issues will be confirmed and assessed during the Assessment Phase of the EIA process.

POLICY AND PLANNING ISSUES

The development of and investment in renewable energy is supported by the National Development Plan (NDP) and National Infrastructure Plan, which all refer to and support renewable energy. The Limpopo Development Plan and Makhado Municipality Spatial Development Framework (SDF) also support the development of renewable energy. The development of the proposed SEF is therefore supported by key policy and planning documents.

CONSTRUCTION PHASE

Potential positive impacts

- Creation of employment and business opportunities, and the opportunity for skills development and on-site training.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of jobseekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.

- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

OPERATIONAL PHASE

Potential positive impacts
- The establishment of infrastructure to improve energy security and support renewable sector.
- Creation of employment opportunities.
- Benefits for local landowners.
- Benefits associated with socio-economic contributions to community development.

Potential negative impacts
- Visual impacts and associated impacts on sense of place.
- Potential impact on property values.
- Potential impact on tourism.

CUMULATIVE IMPACTS

The cumulative impacts include:

- Cumulative impact on sense of place.
- Cumulative impact on local services and accommodation.
- Cumulative impact on local economy.

NO-DEVELOPMENT OPTION

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with clean, renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a significant negative social cost.

INITIAL CONCLUSIONS

Based on the findings of the Scoping SIA the proposed Makoppa Solar PV and associated infrastructure, including the BESS, will create several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phases. The project will also create economic development opportunities for the local community. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for society. The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to Direct Foreign Investment, local employment and procurement and investment in local community initiatives.

The findings also indicate that the land uses in the vicinity of the site do not appear to the socially sensitive. Based on experience from other solar energy projects, the potential negative impacts associated with both the construction and operational phase

can also be effectively mitigated. The proposed development is therefore supported by the findings of the Scoping SIA.

TABLE OF CONTENTS

CONTENTS OF THE SPECIALIST REPORT – CHECKLIST

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	**Section of Report**
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a *curriculum vitae*;	Section 1.6, Annexure C
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.7, Annexure D
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/A for SIA
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.2, Annexure B
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4, Section 5
(g) an identification of any areas to be avoided, including buffers;	N/A
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 3
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.5
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 4, Section 5,
(k) any mitigation measures for inclusion in the EMPr;	Section 4
(l) any conditions for inclusion in the environmental authorisation;	Section 4, Section 5
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	Section 5.3
(o) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	To be undertaken during Assessment Phase
(p) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	

ACRONYMS

BA	Basic Assessment
BESS	Battery Energy Storage System
DM	District Municipality
EIA	Environmental Impact Assessment
HD	Historically Disadvantaged
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
MM	Makhado Municipality
MW	Megawatt
SEF	Solar Energy Facility
SDF	Spatial Development Framework
SIA	Social Impact Assessment
VDM	Vhembe District Municipality

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

Cape EAPrac was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed Makkopa Solar PV located approximately 40 km south of Louis Trichardt in the Limpopo Province (Figure 1.1). The site is located within the Makhado Municipality (MM) in the Vhembe District Municipality (VDM). The Makkopa Solar PV is one of four projects that make up the Tabor Solar PV Cluster. Separate EIAs are being undertaken for each facility and the associated grid connection.

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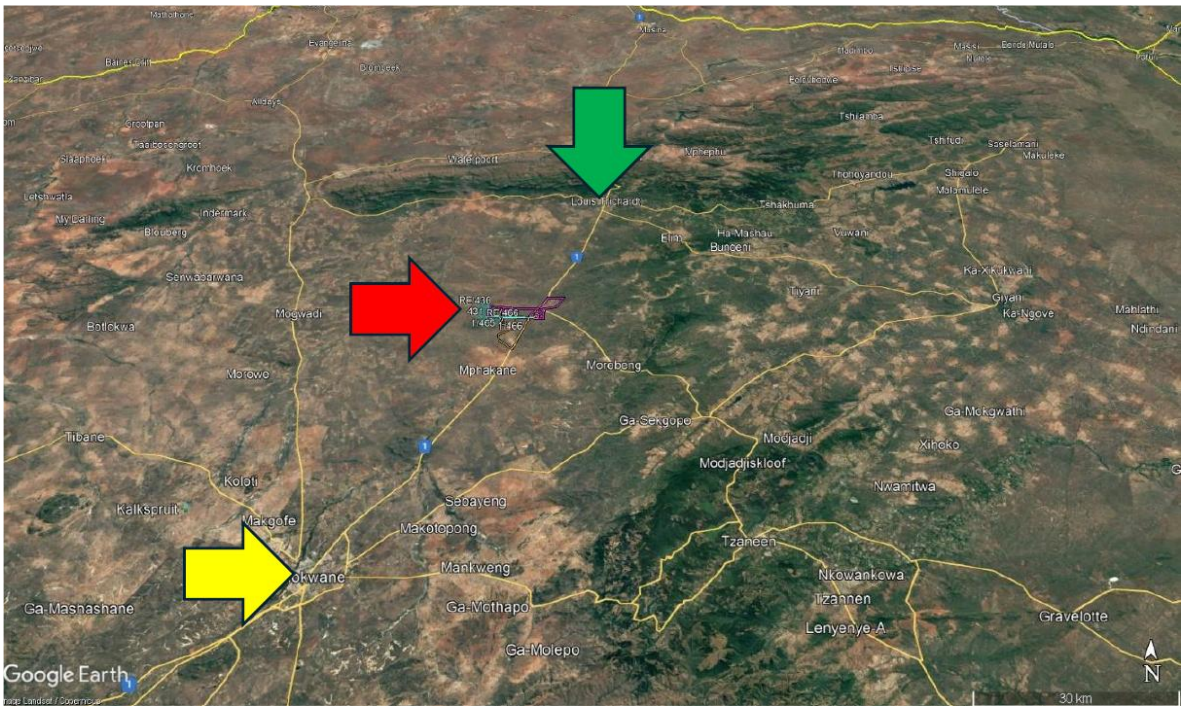


Figure 1.1: Location of site (red) relative to Louis Trichardt (green) and Polokwane (yellow)

1.2 TERMS OF REFERENCE

The terms of reference for the Scoping Level SIA require:

- A description of the environment that may be affected by the activity and the way the environment may be affected by the proposed development.
- A description and initial assessment of the potential social issues associated with the proposed development.
- Identification of potential enhancement and mitigation aimed at maximising opportunities and avoiding and/or reducing negative impacts.

The impacts and associated significance ratings will be confirmed during the Assessment Phase.

1.3 PROJECT DESCRIPTION

The Tabor Solar PV Cluster consists of four Solar PV projects, namely:

- Draailoop Solar PV (red arrow).
- Klipput Solar PV (yellow arrow).
- Bethel Solar PV (blue arrow).
- Mokoppa Solar PV (green arrow).

The location of the four projects is illustrated in figure 1.2.

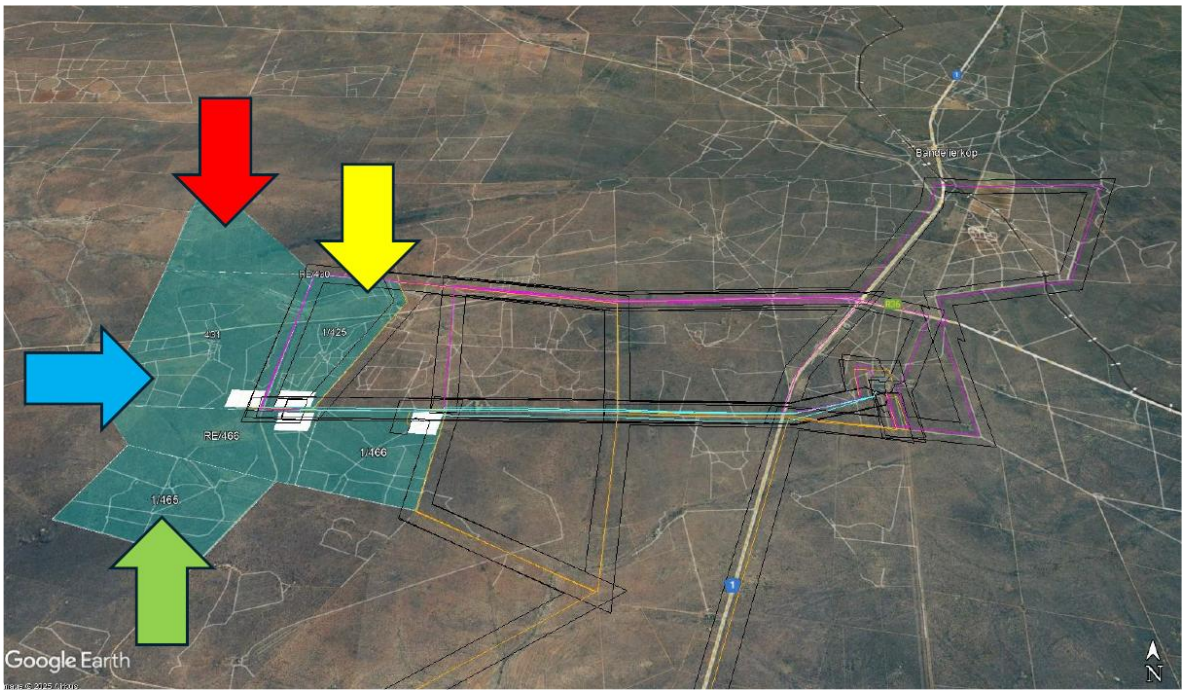


Figure 1.2: Location of Solar PV projects

As indicated above, separate EIAs are being undertaken for each Solar PV. This report is for the Makoppa Solar PV.

Makoppa Solar PV (Pty) Ltd are proposing the construction of a Solar Photovoltaic (PV) Energy Facility and associated infrastructure, known as Makoppa Solar PV, on Portion 1 of Farm 465 located South of Louis Trichardt in the Makhado Local Municipality, Vhembe District, Limpopo Province. A study site of approximately 341ha is being assessed as part of this Environmental Process and the infrastructure associated with an up to 74 Megawatt (MW) PV facility.

The technical details are provided below.

PV facility (Photograph 1.1)

- Solar Arrays: PV modules
- Single axis tracking technology maximum height of 5m (aligned north-south).

- Solar module mounting structures comprised of galvanised steel and aluminium.
- Foundations which will likely be drilled and concreted into the ground
- Solar measurement and weather stations.
- Central/string Inverters and MV transformers in in field.

Associated infrastructure

- Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables.
- MV Collector stations.
- Access road.
- Internal gravel roads.
- Fencing.
- General maintenance area.
- Storm water channels and berms.
- Water storage tanks and pipelines.
- Temporary work area during the construction phase (i.e. laydown area).
- O&M buildings, store

Project IPP Substation

- 132kV substation 200m x 200m.
- HV transformer.
- Substation Control Building.
- HV metering, Scada and protection building.
- MV collector switchgear buildings.
- Compensation equipment.

Battery Energy Storage system (BESS) (Photograph 1.2)

- AC coupled BESS installation (400m x 400m) at project substation and laydown area.
- Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS).
- Battery Cells, Modules, Racks and containers.
- Power Conversion Equipment.
- Battery Management System.
- Energy Management System.
- MV transformers.
- MV cabling and collector stations.
- Fencing.
- Offices, workshop.
- Fire Protection systems.

Grid connection infrastructure for each project may include

- Onsite Switching Station (SS), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation.
- Access Road to SS
- Maintenance access road below or adjacent to the power line.

A separate Basic Assessment (BA) process is being undertaken for the grid connection.

Photograph 1.1: Typical PV SEF facility

Photograph 1.2: Example of BESS located in storage containers

1.4 APPROACH TO STUDY

The approach to the Scoping Level SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact

Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.
- Identifying the key potential social issues associated with the proposed project. This requires a site visit to the area and consultation with affected individuals and communities. As part of the process a basic information document was prepared and made available to key interested and affected parties. The aim of the document was to inform the affected parties of the nature and activities associated with the construction and operation of the proposed development to enable them to better understand and comment on the potential social issues and impacts.
- Assessing and documenting the significance of social impacts associated with the proposed intervention.
- Identifying alternatives and mitigation measures.

In this regard the study involved:

- Review of socio-economic data for the study area.
- Review of relevant planning and policy frameworks for the area.
- Review of information from similar studies, including the SIAs undertaken for other renewable energy projects.
- Identification and assessment of the social issues associated with the proposed project.

A site visit will be undertaken during the Assessment Phase of the SIA. The site visit will include interviews with interested and affected parties. Annexure A contains a list of the secondary information reviewed. Annexure B summarises the assessment methodology used to assign significance ratings to the assessment process.

1.5 ASSUMPTIONS AND LIMITATIONS

1.5.1 Assumptions

Identification of social issues
As indicated above, a site visit will be undertaken during the Assessment Phase of the SIA. The identification of social issues is based on the authors experience with undertaking in the region of 150 SIAs for solar and wind energy facilities and the associated infrastructure (substations, transmission lines, roads etc.). Based on this the author is confident that most social issues have been identified.

Technical suitability
It is assumed that the development site represents a technically suitable site for the establishment of the proposed PV SEF and associated infrastructure.

Strategic importance of the project
The strategic importance of promoting renewable and other forms of energy is supported by the national and provincial energy policies.

Fit with planning and policy requirements
Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard, a key component of the SIA process is to assess the proposed development in terms of its fit with key

planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.

1.5.2 Limitations

Demographic data
Ward level data from the 2022 Census was not available at the time of preparing the report. This limitation does not have a material bearing on the findings of the SIA.

Site visit
A site visit will be undertaken during the Assessment Phase of the SIA. The site visit will include interviews with interested and affected parties. However, as indicted above, the author is confident that most social issues have been identified.

1.6 SPECIALIST DETAILS

Tony Barbour is an independent specialist with 30 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 300 SIAs and is the author of the Guidelines for Social Impact Assessments for EIA's adopted by the Department of Environmental Affairs and Development Planning (DEA&DP) in the Western Cape in 2007. Annexure C contains a copy of CV for Tony Barbour.

1.7 DECLARATION OF INDEPENDENCE

This confirms that Tony Barbour, the specialist consultant responsible for undertaking the study and preparing the Scoping Level SIA Report, is independent and does not have a vested or financial interest in the proposed development being either approved or rejected. Annexure D contains a copy of signed declaration of independence.

1.8 REPORT STUCTURE

The report is divided into four sections, namely:

- Section 1: Introduction
- Section 2: Summary of key policy and planning documents relating to renewable energy and the area in question
- Section 3: Overview of the study area
- Section 4: Identification of key social issues

SECTION 2: POLICY AND PLANNING ENVIRONMENT

2.1 INTRODUCTION

Legislation and policy embody and reflect key societal norms, values, and developmental goals. The legislative and policy context therefore plays an important role in identifying, assessing, and evaluating the significance of potential social impacts associated with any given proposed development. An assessment of the "policy and planning fit[1]" of the proposed development therefore constitutes a key aspect of the Social Impact Assessment (SIA). In this regard, assessment of "planning fit" conforms to international best practice for conducting SIAs.

Section 2 provides an overview of the policy and planning environment affecting the proposed project. For the purposes of meeting the objectives of the SIA the following policy and planning documents were reviewed:

- The National Energy Act (2008).
- The National Development Plan (2011).
- The White Paper on Energy Policy (1998).
- The White Paper on Renewable Energy (2003).
- National Infrastructure Plan (2012 /2021)
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- Climate Change Bill (2018 / 2021).
- Just Energy Transition Investment Plan (2023-2027).
- Limpopo Provincial Development Plan (2020-2025).
- Limpopo Provincial Spatial Development Framework (2022).
- Makhado Integrated Development Plan (2023-2024).
- Makhado Spatial Development Framework (2020).

The section also provides a review of the renewable energy sector in South Africa.

2.2 NATIONAL POLICY ENVIRONMENT

2.2.1 National Energy Act (Act No 34 of 2008)

The National Energy Act (Act No. 34 of 2008) provides the legal framework for South Africa's energy policy, ensuring supply security, energy efficiency, and sustainability. The Act promotes the diversification of energy sources, including the integration of renewable energy, and ensures energy security with an uninterrupted and affordable supply. It also facilitates investment in infrastructure for the expansion and modernisation of the national grid and encourages renewable energy generation through independent power producers (IPPs). Additionally, the Act supports research and development in clean energy innovation. The Act underpins policies such as the IRP and REIPPPP, which are key to increasing renewable energy capacity.

2.2.2 National Development Plan

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030. The NDP identifies 9 key challenges and associated

[1] Planning fit" can simply be described as the extent to which any relevant development satisfies the core criteria of appropriateness, need, and desirability, as defined or circumscribed by the relevant applicable legislation and policy documents at a given time.

remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy.

2.2.3 White Paper on Energy Policy

Investment in renewable energy initiatives, such as the proposed Wind Farm, is supported by the White Paper on Energy Policy for South Africa (December 1998). In this regard, the document notes:

- Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential.
- Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future".

The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly solar and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

Government policy on renewable energy is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented.
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential, and compared to investments in other energy supply options.
- Addressing constraints on the development of the renewable industry.

The White Paper also acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive, and many appropriate applications exist.

2.2.4 White Paper on Renewable Energy

The White Paper on Renewable Energy (November 2003) (further referred to as the White Paper) supplements the *White Paper on Energy Policy*, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals, and objectives for promoting and implementing renewable energy in South Africa.

The White Paper notes that while South Africa is well endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. As signatory to the Kyoto Protocol[2], Government is determined to make good the country's commitment to reducing

[2] The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005. As of November 2009, 187 states have signed and ratified the protocol (Wikipedia).

greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operate.

South Africa is also a signatory of the Copenhagen Accord, a document that delegates at the 15th session of the Conference of Parties (COP 15) to the United Nations Framework Convention on Climate Change agreed to "take note of" at the final plenary on 18 December 2009. The accord endorses the continuation of the Kyoto Protocol and confirms that climate change is one of the greatest challenges facing the world. In terms of the accord South Africa committed itself to a reduction target of 34% compared to business as usual. In this regard, the Integrated Resource Plan (IRP) 2010 aims to allocate 43% of new energy generation facilities in South Africa to renewables.

2.2.5 Integrated Resource Plan (2019)

South South Africa's National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines a desired destination where inequality and unemployment are reduced, and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living. In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) 2010–2030 promulgated in March 2011. The IRP is an electricity infrastructure development plan based on least-cost electricity supply and demand balance, taking into account security of supply and the environment (minimise negative emissions and water usage).

On 27 August 2018, the then Minister of Energy published a draft IRP which was issued for public comment (Draft IRP). Following a lengthy public participation and consultation process the Integrated Resource Plan 2019 (IRP 2019) was gazetted by the Minister of Mineral Resources and Energy, Gwede Mantashe, on 18 October 2019, updating the energy forecast for South Africa from the current period to the year 2030. The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost.

The IRP notes that South Africa is a signatory to the Paris Agreement on Climate Change and has ratified the agreement. The energy sector contributes close to 80% towards the country's total Green House Gas (GHG) emissions of which 50% are from electricity generation and liquid fuel production alone. A transmission from a fossil fuel-based energy sources is therefore critical to reducing GHG emissions. In September 2021 South Africa released its latest emission targets, indicating that it intended to limit Green House Gas (GHG) emissions to 398-510 MrCo2e by 2025, and 350-420 MrCo2e by 2030. These emissions are significantly lower than 2016 emission targets and will see South Africa's emissions decline in absolute terms from 2025, a decade earlier than planned (World Resource Institute, 2021).

The IRP 2019 highlighted the need for 39,730 MW of new generation capacity by 2030. Of this, about 18,000 MW had been committed by 2019, comprising:

- 6,422 MW under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), with 3,876 MW operational.
- 1,332 MW from Ingula Pumped Storage, 1,588 MW from Medupi, 800 MW from Kusile, and 100 MW from Sere Wind Farm under Eskom's build programme.
- 1,005 MW from Independent Power Producers' Open Cycle Gas Turbine (OCGT) plants.

The capacity provisions listed on the IRP 2019 are:

- 1 500MW of coal.
- 2 500MW of hydro.
- 6 000MW of solar PV.
- 14 400MW of wind.
- 1 860MW of nuclear.
- 2 088MW for storage.
- 3 000MW of gas/diesel.
- 4 000MW from other distributed generation, co-generation, biomass and landfill technologies.

As indicated above, the changes from the Draft IRP capacity allocations see an increase in solar PV and wind, and a significant decrease in gas and diesel; and new inclusions include nuclear and storage.

In terms of renewable energy seven bidding rounds have been completed for renewable energy projects under the RE IPP Procurement Programme. The most dominant technology in the IRP2019 was renewable energy from wind and solar PV technologies, with wind being identified as the stronger of the two technologies.

Following the release of the 2019 IRP, it was updated in 2023 and 2024. In December 2023, the South African Cabinet approved the Draft IRP 2023. Covering two-time horizons (to 2030 and 2050), the plan proposed 29.3 GW of new capacity by 2030, including:

- 7 GW of gas projects.
- 4.5 GW of wind.
- 3.6 GW of solar PV.
- 6.3 GW of distributed generation.

However, IRP 2023 acknowledged that energy security challenges might persist until the decade's end.

Released in November 2024 following stakeholder consultations, IRP 2024 marked significant revisions, particularly a substantial increase in onshore wind energy allocations, reaching up to 76.4 GW across scenarios. Key highlights include:

- Enhanced Renewable Energy Focus: Scaling up wind and solar PV to align with energy security and climate commitments.
- Improved Energy Availability: Adjusting assumptions about Eskom's energy availability factor to reflect operational improvements.
- Stakeholder Engagement: Ensuring diverse perspectives informed the updated plan.

The IRP 2024 reflects a forward-looking strategy, with finalisation anticipated in early 2025. This update underscores South Africa's commitment to a balanced and sustainable energy transition, addressing both immediate challenges and long-term goals.

2.2.6 National Infrastructure Plan

Government adopted a National Infrastructure Plan (NIP) in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. The aim of the NIP is support investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that

investment in the construction of ports, roads, railway systems, ***electricity plants***, hospitals, schools, and dams will contribute to improved economic growth.

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 strategic integrated projects (SIPS). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions) and included three energy SIPs, namely SIP 8, 9 and 10.

- SIP 8: Green energy in support of the South African economy.
- SIP 9: Electricity generation to support socio-economic development.
- SIP 10: Electricity transmission and distribution for all.
- SIP 28: Integrated Resource Efficiency and Renewable Energy Programme

The NIP 2050 was gazetted for public comment on 10 August 2021[3]. The first phase of the NIP 2050 focuses on four critical network sectors that provide a platform, namely, energy, freight transport, water, and digital infrastructure. In line with the NDP, the vision for the energy sector is to promote:

- Economic growth and development through adequate investment in energy infrastructure" (generation, transmission, and distribution) and reliable and efficient energy service at competitive rates, while supporting economic growth through job creation by stimulating supply chains.
- Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- Environmental sustainability through efforts to reduce pollution, reduce water usage and mitigate the effects of climate change.

The NIP 2050 notes that by 2030, the NDP set a target that more than 90% of the population should enjoy access to grid connected or off-grid electricity by 2030. To realise this vision, South Africa's energy system will be supported by effective policies, institutions, governance systems, regulation and, where appropriate, competitive markets. In terms of energy mix, NIP 2050 notes that coal will contribute significantly less to primary-energy needs in the future, while gas will have an important enabling role, energy supply will be ***increasingly dominated by renewable energy resources– especially wind and solar which are least cost and where South Africa has a comparative advantage.***

NIP 2050 also notes that South Africa is signatory of the Paris Agreement which aims to achieve Net Zero greenhouse gas emissions by 2050. To achieve this will require a shift to a least cost energy path that is increasingly reliant on renewables.

2.2.7 Climate Change Bill (2018 and 2021)

The Climate Change Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The following objectives are set within the Bill:

- Provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance.

[3] Gazette No. 44951

- Provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic, and environmental resilience and an adequate national adaptation response in the context of the global climate change response.
- Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner.

An updated Climate Change Bill was published in 2021 for comment. The Bill notes that climate change represents an urgent threat to human societies and the planet, and requires an effective, progressive and incremental response from both government and citizens. The updated Bill recognises that South Africa has a global responsibility to reduce greenhouse gasses and that the anticipated impacts arising as a result of climate change have the potential to undermine achieving of the country's developmental goals. The main objective of the Bill is to enable the development of an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society.

2.2.8 Just Energy Transition Investment Plan (2023-2027)

Following consultation amongst government, business, organised labour, and civil society, the Presidential Climate Commission (PCC) concluded the Just Transition Framework which was adopted by Cabinet in August 2022 to guide South Africa's overall approach to the climate transition. The Political Declaration was signed between the Government of South Africa and the Governments of France, Germany, United Kingdom (UK), United States (US), and the European Union (EU) (collectively, the International Partners Group [IPG]) at COP26, gave rise to the establishment of the Just Energy Transition Partnership (JETP). The JETP undertakes to

"Establish an ambitious long-term partnership to support South Africa's pathway to low emissions and climate resilient development, to accelerate the just transition and the decarbonisation of the electricity system, and to develop new economic opportunities such as green hydrogen and electric vehicles amongst other interventions to support South Africa's shift towards a low carbon future."

South Africa's Just Energy Transition Investment Plan (JET IP) for the five-year period, 2023–2027, sets out the scale of need and the investments required to support the decarbonisation commitments made by the Government of South Africa. The JET IP is premised on South Africa's National Development Plan (NDP) 2030 with its focus on tackling the country's systemic challenges of poverty, inequality, and unemployment. The document notes that South Africa's energy transition represents an opportunity for the country to drive industrial development, innovation, and economic diversification.

The JET IP defines a just *energy* transition as:

"A just energy transition in South Africa builds resilient economies and people to meet the NDC targets. It does so by (i) accelerating affordable, decentralised, diversely owned renewable energy systems; (ii) restoring previous and future ecosystems and natural resources impacted by coal mining and energy production; (iii) reskilling present workforces and educating future ones in green and other new and viable development pathways; (iv) building new productive models for comprehensive economic transitions; and (v) supporting various impacted constituencies to play an

active role in decisions and implementation of energy transition programs (be it government or non-government actors).”

The JET IP notes that South Africa faces considerable climate and energy-related risks. These include shortages of electricity supply, under-investment in the electricity system, as well as physical, social, and transition risks. High carbon-intensity of production and economic dependency on fossil fuel value chains require specific interventions to manage and mitigate the consequences of transition, particularly for impacted workers, communities, small business, and exporters’ exposure to carbon trade barriers. At the same time, embracing new economic opportunities in green technologies can drive industrial development, innovation, and economic diversification, leading to a sustainable and economically resilient future, characterised by decent work, social inclusion, and lower levels of poverty.
To support the goals of energy security, just transition, and economic growth, the JET IP identifies the priority investment requirements over the next five years in the electricity, NEVs, and GH2 sectors.

In terms of the electricity sector, the infrastructure investment priorities are:

- To manage the decommissioning of the retiring coal generation fleet, in line with a revised Integrated Resource Plan (IRP), and in tandem with the development of renewable energy generation at scale and pace.
- To timeously strengthen the transmission grid infrastructure to accommodate the shift to renewable energy.
- To modernise the electricity distribution system.

Section 4.2.2.2 of the IP covers the requirements for investment in new energy generation capacity. The section notes that the retirement of coal plants, the existing supply deficit, as well as growth in electricity demand, will necessitate considerable investment in new generation capacity by the country – which will include Eskom, local authorities who own and operate electricity distribution systems, by the private sector, and others. Rapid investment in new capacity will also address the current electricity supply crisis. The JET IP notes that in addition to relieving the current pressure on the existing coal plants, the short lead times for wind and solar PV plants imply considerable flexibility in capacity additions.

The IP notes that both the current supply crisis and the need to meet climate change mitigation objectives and compliance challenges, in relation to air pollution regulations, necessitates the addition to the electricity system of around 50 GW of new renewable electricity capacity to the grid, plus the associated gas/battery/storage capacity to ensure security of supply and grid stability. Therefore, over the 2023-2027 period, to resolve the electricity supply crisis and to keep pace with investment requirements to meet South Africa’s NDC targets and long-term decarbonisation objectives, it will be necessary to add around 6 GW of new renewable electricity capacity to the grid each year, as well as the required gas/storage capacity.

2.3 PROVINCIAL AND LOCAL LEVEL POLICY AND PLANNING

2.3.1 Limpopo Provincial Development Plan

The Limpopo Provincial Development Plan (LPDP) aims to transform the productive potential of Limpopo Province, while addressing its inherent socio-economic challenges and ensuring sustainable livelihoods. In terms of achieving its potential the plan highlights the risks posed by climate change. The LDP outlines the key role played by mining, agriculture, manufacturing, and tourism sectors, and identifies the following critical development objectives:

- Ensure sustainable development.
- Create decent employment through inclusive economic growth and sustainable livelihoods.
- Improve the quality of life of citizens.
- Raise the effectiveness and efficiency of a developmental public service.
- Promote vibrant and equitable sustainable rural communities.
- Prioritise social protection and social investment.

The vision for the LPDP is "Limpopo – The Pride of Africa. A resilient, vibrant, and prosperous Province inspired by its diverse and creative people and its environment." To realise this vision, the LPDP has developed a Development Strategy that provides a framework and is expressed in the following eight priorities:

- Priority 1: Transform the public service for effective and efficient service delivery.
- Priority 2: Transformation and modernisation of the provincial economy.
- Priority 3: Provision of quality education and a quality healthcare system.
- Priority 4: Integrated and sustainable socio-economic infrastructure development.
- Priority 5: Accelerate social change and improve quality of life of Limpopo's citizens.
- Priority 6: Spatial transformation for integrated socio-economic development.
- Priority 7: Strengthen crime prevention and social cohesion.
- Priority 8: Economic transformation and job creation through regional integration.

Each priority has several strategic responses, outcomes, and key actions needed to fulfil them. Priority 2 and 4 and their strategic responses are of relevance to the project.

2.3.2 Limpopo Provincial Spatial Development Framework

The Limpopo Provincial Spatial Development Framework (LPSDF) forms part of a hierarchy of plans that consolidate into the LPDP. It concentrates on the spatial aspects of development planning and identifies the economic and environmental opportunities and constraints associated with the province, while providing a spatial link between national and municipal planning.

The vision of the LPSDF is "The Limpopo SDF envisions a provincial spatial structure where the natural environment and valuable agricultural land in the rural areas are protected for future generations, with a strong, diverse and growing economy focused on a range of nodal areas and that offers its residents high quality living environments and good job opportunities in a sustainable manner."

To achieve this vision, five Provincial Spatial Outcomes where developed based on the National Spatial Outcomes and added to the spatial vision for Limpopo. Additionally, a number of Provincial Spatial Development Objectives were included as follows:

- Capitalise on the Province's strategic location within the SADC region to facilitate trade links and regional cooperation on resource sharing.
- Capitalise on and improve regional and local connectivity to establish a connected network of nodes and settlements.
- Provide a strategic and coherent rationale for public sector investment, including engineering, community and economic infrastructure, to optimise service delivery.
- Encourage urban and rural spatial restructuring to address spatial injustice and facilitate climate change mitigation and adaptation.
- Aggressively protect and enhance the Province's natural resources, including scarce fresh water sources and high biodiversity landscapes.

- Guard valuable agricultural land as a scarce resource and national asset.
- Consolidate and enhance the Province's ecotourism product.
- Encourage and institutionalise the sustainable development of its massive mineral potential and encourage diversification and industrialisation through green economy initiatives.
- Create an enabling environment for both large- and small-scale business development (retail, office, commercial, industrial).

The LPSDF also lists 11 Developmental Principles (DP) to support its vision, namely:

- DP 1: Define and protect a Provincial Regional Open Space System which ensures that ecosystems are sustained, and natural resources are utilised efficiently.
- DP 2: Facilitate efficient spatial targeting through the identification of a range of provincial, district, municipal and rural nodal points to serve as focal points for investment and service delivery.
- DP 3: Establish a multi-modal transport network to optimise the movement of people and goods between nodes in the province and to all major destinations in Southern Africa.
- DP 4: Direct engineering infrastructure investment towards the priority nodal points where the majority of economic activity and human settlements will establish.
- DP 5: Prioritise consolidation of community infrastructure at the identified nodal points and in line with the concept of multi-purpose Thusong Centres/ Rural Development Centres in Rural Nodes.
- DP 6: Create conditions conducive to development in multi-functional business areas and implement Urban Revitalisation Strategies in such areas where required.
- DP 7: Optimise the utilisation of agricultural potential of Limpopo Province to provide sustainable livelihoods to marginalised communities in rural areas in partnership with commercial farms.
- DP 8: Utilise the provincial environmental resources as attractions to promote sustainable tourism development (and conservation) in all parts of the Province.
- DP 9: Promote mining activity and associated job creation potential in an environmentally sustainable manner.
- DP 10: Address industrial sectoral diversification by way of area-specific investment in high value production and value-added technologies and industries.
- DP 11: Sustainable Human Settlements in urban and rural Limpopo Province.

Following the adoption of the LSDF in 2016, the Provincial Growth Point Programme was initiated, which applied the spatial nodal hierarchy in the allocation of public investment. Of relevance Lephalale forms one of the five priority provincial growth points and has been earmarked for the Energy and developed Green City Strategy. Additionally, the Limpopo Green Economy Plan was also identified in the LPSDF and centres on local production and consumption, efficient and sustainable use and provision of energy and water, and care of natural and created resources. The LSDF also references the Integrated Resource Plan and its proposal to diversify energy sources, which has spatial implications for the Province due to its reliance on coal and mining.

2.3.4 Makhado Municipality Integrated Development Plan

The vision statement for the MM is a "a dynamic hub for socio-economic development by 2050". The supporting mission statement is "to ensure effective utilization of economic resources to address socio–economic imperatives through mining, agriculture and tourism".

The IDP lists five key performance areas (KPAs), namely:

- KPA 1: Financial stability
- KPA 2: Basic Service Delivery and Infrastructure Planning
- KPA 3: Municipal transformation and organizational development
- KPA 4: Local economic development
- KPA 5: Good Governance and Public Participation

KPA 2 and 4 are relevant to the development. The IDP identifies several developmental challenges and opportunities. The challenges and opportunities that are relevant to the development include:

Challenges
- Poverty and Unemployment.
- Low literacy rate.
- National Electricity Generation Capacity constraints.
- Climate change.

Opportunities
- Availability of land.
- Tourism attraction areas (destinations).
- Mining and agricultural opportunities.
- Favourable climatic conditions for agriculture.
- Game farming.
- Good communication and transport network

Some of the opportunities, such as game farming and tourism, may conflict with renewable energy facilities. However, all the opportunities, specifically mining and agriculture, are also dependent on a reliable, affordable energy supply. The IDP also identifies economic challenges and opportunities of which the following are relevant to the proposed development.

Economic challenges
- Small local economy compared to other economies in the Limpopo Province. As such the municipality is dependent on changes in the provincial economy.
- Low level of formal education, vocational training and the development of entrepreneurship.
- Weak forward and backward linkages between the various economic activities.
- SMME sector lacks institutional arrangements and structure.

Economic opportunities
The economic opportunities listed are all linked to the agricultural sector and include processing of agricultural products, which will require a reliable energy supply. The IDP also refers to the establishment of a special economic zone (SEZ) in the Makhado Municipality, noting that the minister of Trade and Industry has designated Makhado Municipality for the South African Energy and Metallurgical SEZ. MMSEZ Musina-Makhado Special Economic Zone is a flagship of the Limpopo Provincial Government. The MMZEZ website indicates that the MMSEZ is a green field investment platform consisting of two sites in the northern part of South Africa, in Limpopo Province. The clusters are organised around energy and metallurgy and the other on three sectors, i.e. general manufacturing, agro-processing and logistics. The North site is in the Musina Municipality, approximately 15 km southeast of Beitbridge Border Post between South Africa and Zimbabwe. No reference is made of the second site in the website.

In terms of land uses, the IDP notes that most of the population reside in rural areas that are largely undeveloped. The IDP also notes that there are pockets of extreme poverty within the Municipal area. The patterns of poverty and inequality have been

reinforced by economic trends that have impacted on semi-skilled and unskilled workers. This includes the seasonal nature of agricultural, tourism and domestic work. The economic opportunities for the poor have also been undermined by the lack of connectivity between residential areas and economic hubs (between towns), poor levels of social cohesion and gender inequality.

The high levels of poverty are reflected in the number of households that receive free basic services from the municipality. In this regard 129 224 of the 140 338 households in the MM receive free basic water and 6 041 receive free basic electricity.

Based on engagement with local communities as part of the IDP process a list of priority issues were identified, these include:

Infrastructure cluster priorities
- Electricity provision and community lighting.
- Sport facilities.
- Community facilities, e.g. Libraries and Community Halls

Social cluster priorities
- Community development.

Economic cluster priorities
- Creation of an enabling environment for economic development.
- Creation of jobs.
- Poverty alleviation.
- Promotion of tourism.
- Promotion of mining.
- Supporting Small Micro and Medium Enterprises.

At a ward level, the site is in Ward 20. The key needs identified for Ward 20 include need for a multi–sport facility and upgrading of existing sports facilities. It may be possible to address some of these needs as part of the socio-economic development contributions linked to the development.

2.3.5 Makhado Municipality Spatial Development Framework

The spatial vision for the MM is "By 2050 Makhado Local Municipality will be a hub for socio-economic development, and an environmentally sustainably and functionally efficient Municipality". The SDF identifies 5 spatial objectives (Sos), namely:

- Strategic Objective 1: Enhance economic potential and coordinated planning and implementation.
- Strategic Objective 2: Infrastructure Investment.
- Strategic Objective 3: Rural Development and Transformation.
- Strategic Objective 4: Development of road and rail networks.
- Strategic Objective 5: Environmental conservation and prime agricultural land protection.

Objectives 1, 2 and 5 are relevant to the development.
The SDF lists the spatial challenges and opportunities facing the MM.

Spatial challenges
- Fragmented spatial configuration between rural and urban areas which is characterised mostly by dispersed settlements, resulting in unbalanced services and infrastructure development between these areas

- Lack of integrated human settlements development in town.
- Tribal land has a significant impact on development. There is no agreement/arrangement between municipality and tribal authority on how to manage tribal land by the municipality. The agreement is required to be enforced by SPLUMA.
- The development and growth of the urban core is limited because of ongoing land claims.
- The land restitution process restricts investment and the development of land.

Spatial opportunities

- Use of strategically located vacant land parcels as a catalyst for densification, integration and mixed land use orientated development.
- The municipal area has a well-developed road and rail network. The road network includes links to the N1 running north-south through the area and the Trans-Limpopo corridor.
- The municipality owns substantial amount of land for residential development.
- There is also a land use management scheme in operation within the town including a densification policy.
- Biodiversity protection areas such as the Soutpansberg biosphere.
- Farming areas, namely, Commercial farming areas; and small scale or subsistence farming areas.

In terms of settlements**,** Louis Trichardt Town, including Tshikota, is identified as a 1st Order Settlement, namely a settlement that includes provincial growth points, district growth points and municipal growth points. The MMs transportation network is dominated by roads, with the N1 National Route the most important road link. At a regional level the N1 connects the Botlokwa/Machaka/Mphakane node with the logistics hub and provincial growth point of Polokwane to the south and the newly declared Special Economic Zone of Musina-Makhado. The SDF notes that with the massive investment earmarked for the new SEZ it is envisaged that more passenger transportation and freight will increase in volumes thereby serving as a stimulus for the economy of the Botlokwa/Machaka node and surrounding settlements that fall within the sphere of influence of the node. The SEZ is a joint venture between the MM and Musina. The aim of the SEZ is to attract investment and industrial development to the area.

The SDF notes that the formal economy of the MM can be described as a dual economy, that consists of two distinct elements namely the established economy of the Louis Trichardt and surrounding farms and the informal economies of surrounding townships and rural areas. Louis Trichardt provides a regional function to the surrounding areas (e.g., trade services, banking, manufacturing, storage, transport, etc), because of its size and level of sophistication.

The SDF identifies four Spatial Development Principles, namely:

- Spatial Development Principle 1: Create an Enabling Economic Environment and Strengthen the Bases of The Existing Economic Centres
- Spatial Development Principle 2: Optimise Agricultural production and processing in all parts of the municipality.
- Spatial Development Principle 3: Tourism development.
- Spatial Development Principle 4: Promote mining activity and associated job creation potential in an environmentally sustainable manner.

Spatial Development Principle 1 is relevant to the development. Investments in infrastructure is associated with Spatial Development Principle 1. Of specific relevance

the SDF notes that the MM will explore the possibility of generating energy from renewable sources. The SDF also highlights the importance of environmental conservation and the protection of prime agricultural land and notes that:

- All land development applications with a bearing on critical biodiversity environment should go through the municipality's environmental division before being submitted to the Municipal Planning Tribunal for consideration.
- Ensure new development and redevelopment is in line with the municipality's current environmental policy and trajectory.

As indicated in Figure 2.1, the proposed development is not located in an environmentally sensitive area. The land capability in the study area is also rated as low (pink area) (Figure 2.2).

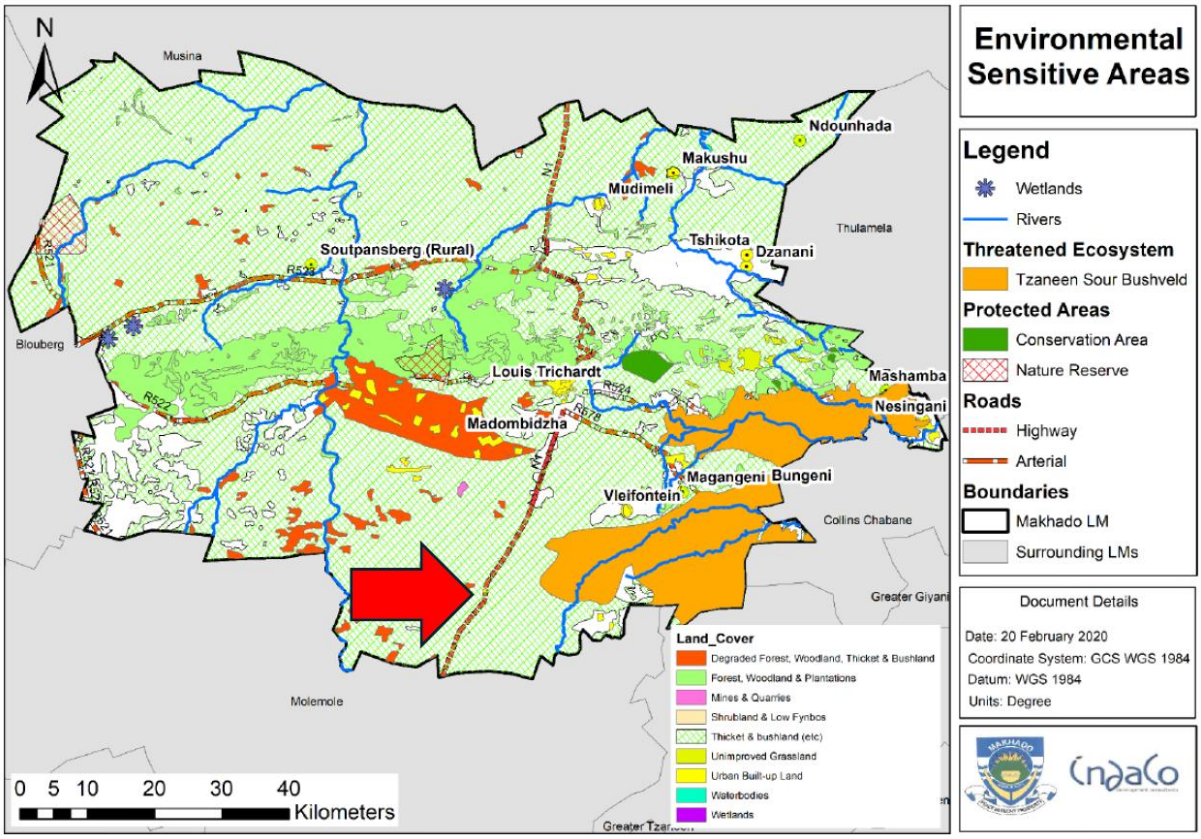


Figure 2.1: Location of environmental sensitive areas (location of site red arrow)

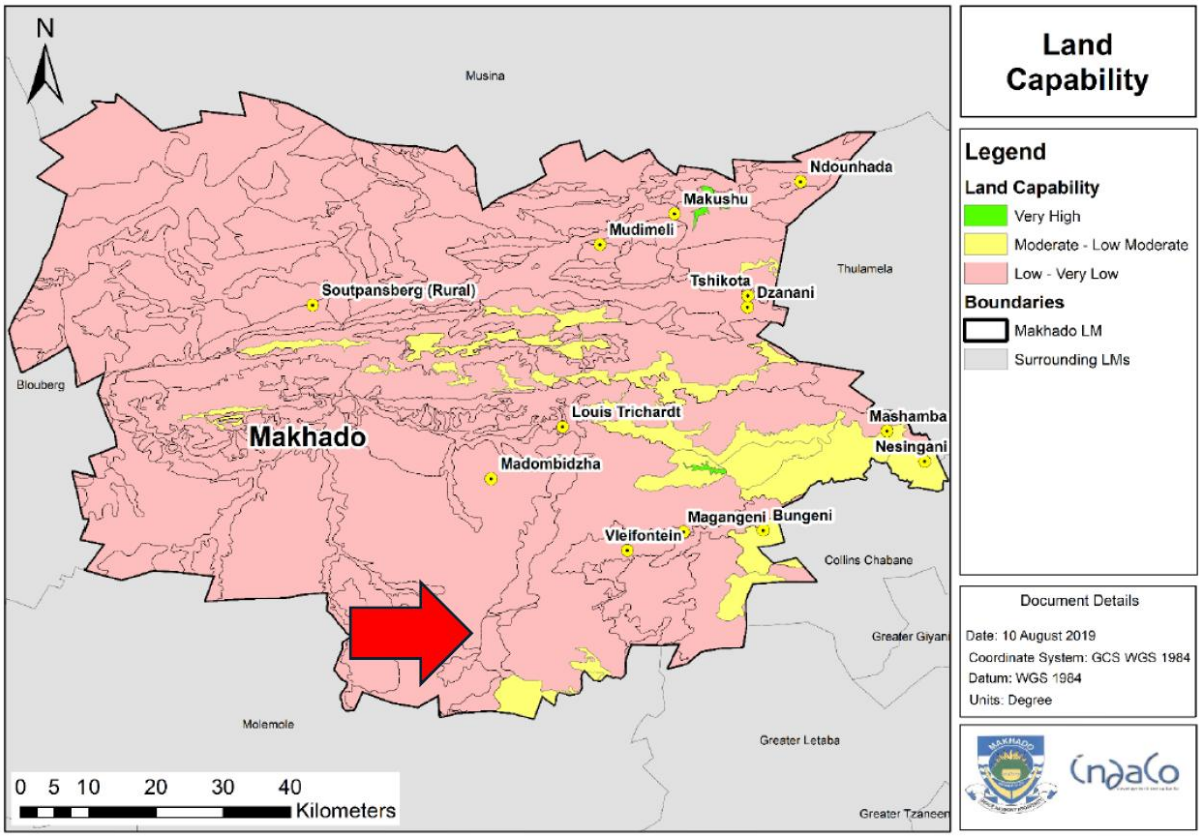


Figure 2.2: Land capability map (location of site red arrow)

2.4 OVERVIEW RENEWABLE ENERGY SECTOR IN SOUTH AFRICA

The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. These benefits include:

Socio-economic benefits for local communities
A study undertaken by the DMRE[4], National Treasury and the Development Bank of Southern Africa (DBSA) in June 2017 found that employment opportunities created during the construction phase of renewable energy projects implemented to date had created 40% more jobs for South African citizens than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned, confirming the potential benefits for local communities associated with the implementation of renewable energy projects.

Research by Tait[5] found that the distributed nature of renewable energy generation can induce a more geographically dispersed pattern of development. As a result, renewable energy sites can be highly suited to rural locations with otherwise poor potential to attract local inward investment therefore enabling to target particularly vulnerable areas. In her conclusion, Tait notes that the thesis has found positive evidence for the establishment of community benefit schemes in the wind sector in South Africa. These benefits would also apply to solar projects.

[4] Now the DoEE

[5] The potential for local community benefits from wind farms in South Africa, Louise Tait (2012), Master's Thesis, Energy Research Centre University of Cape Town.

Increased energy security
Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses. According to CSIR's power sector statistics[6], South Africa experienced load shedding for 1 169 hours in 2021 (~13% of the time) wherein 2 521GWh of estimated energy was shed (mostly stage 2 load shedding). This is a 40% increase on the total load shedding experienced during 2020. It is important to note that although extensive load shedding continued during 2021, record relative variable renewable energy contributions were recorded, with solar PV contributing 5.1 TWh.

Economic viability
Due to South Africa's wind and solar resources, coupled with a competitive procurement process, both wind power and solar PV power are cheaper forms of energy generation than coal power. Wind and solar therefore offer excellent value for money to the economy and citizens of South Africa while benefitting society through the development of clean energy.

According to the IPP Procurement Programme overview report (March 2023), the following has been achieved by the IPP programme in terms of investment and economics:

- R274.3 billion[7] investment attracted into South Africa's economy for energy infrastructure from projects.
- Total Procurement Spend of R99.4 billion.
- Socio-economic development contributions of R2.3 billion.
- Enterprise development contributions of R0.7 billion.

Resource saving
It is estimated that meeting the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As a water-stressed country water conservation represents a key priority, specifically within the context of climate change. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free, while compared to the continual purchase of fuel for conventional power stations. According to the IPP Procurement Programme overview report dated 31 March 2023, water savings of 109.9 million kilolitres has been realised by the programme from inception to the date of the 2023 publication.

Availability of renewable energy resources
Renewable energy creates an opportunity to diversify South Africa's energy portfolio and improve energy security and efficiency. According to the IPP Procurement Programme overview report, as of 31 March 2023, the REIPPPP has successfully procured 7 090 MW from 97 IPPs (that reached financial close) in BW1 to BW5, which are at various stages of construction or have commenced with commercial operation. By end March 2023, 6 131MW of the procured capacity started operations and delivered 6 105 MW of actual capacity (i.e. 89 IPPs delivering 26 MW short of procured capacity). Five (5) preferred bidders (860 MW) were announced for BW6 on 8 December 2022. An additional preferred bidder (identified as an eligible bidder on 8 December 2022) was announced on 23 March 2023 to increase the procured MW to the maximum 1 000 MW from solar PV. Since the

[6] CSIR Energy Centre. Statistics of utility-scale power generation in South Africa in 2021. April 2022,

[7] From 123 projects in BW1-6

amendment of Schedule 2 of the Electricity Regulation Act in December 2022, 430 energy generation projects (with a capacity of ~4 550MW in total) has been registered with NERSA[8].

Pollution reduction

The release of by-products through the burning of fossil fuels for electricity generation impacts on climate change and human health and contributes to ecosystem degradation. Renewable energy creates an opportunity to address energy needs in an environmentally responsible manner, thereby allowing South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. According to the Climate Transparency Report (2020), total GHG emissions in South Africa (excluding land use) have increased by 41% since 1990, but emissions in recent years have been almost constant, owing largely to low economic growth and a sharp rise in electricity prices. South Africa is ranked 12th worldwide in terms of per capita carbon dioxide emissions as of 2021.The overview of the Independent Power Producers Procurement Report (March 2023) indicates that electricity generated by 89 operational IPP projects are offsetting 93.0 Mton CO_2. The

Support for international agreements

The development of the renewable energy enables South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol and the Paris Agreement and its commitment to a Just Energy Transition.

[8] Source: https://www.nersa.org.za/electricity-overview/electricity-registration/ (RegisteredGenFACDatabase_January-2024)

SECTION 3: OVERVIEW OF STUDY AREA

3.1 INTRODUCTION

Section 3 provides a baseline description of the study area with regard to:

- The administrative context.
- Provincial context.
- Overview of district and local municipalities.
- Site and the surrounding land uses.

3.2 ADMINISTRATIVE CONTEXT

The study area is located within the Makhado Municipality (MM), which falls within the Vhembe District Municipality (VDM) in the Limpopo Province (Figure 3.1). The MM is one of four local municipalities that make up the VDM. The other three are the Musina, Thulamela and Collins Chabane local municipalities. Louis Trichardt is the administrative seat of the MM. The administrative seat of the VDM is Thohoyandou.

Figure 3.1: Location of the Makhado Municipality within the Vhembe District Municipality

3.3 MUNICIPAL OVERVIEW

Population

The population of the MM was 502 397 in 2022 (Census 2022) compared to 411 353 in 2011. Of this total, 31.3% were under the age of 15, while 61.6% fell withing the economically active age of between the ages of 15 and 64, and the remaining 7.1% were 65 and older. Based on this breakdown the dependency rate was 62.3%, which is lower that the figure of 69.8% in 2011.

The dependency ratio is the ratio of non-economically active dependents (people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates to reduced revenue for local authorities to meet the growing demand for services.

In terms of race groups in 2022, Black Africans made up 96.47% of the population of the MM, followed by Whites (2.41%), and Indians or Asians (0.67%). The main home language spoken was Tshivenda (75.88%), followed by Xitsonga (14.58%), Shona (2.34%) and Sepedi (2.31%).

Households and house types

Based on the 2022 Census, there were a total of 140 338 households in MM. Of this total 91.3% reside in formal dwellings, while 3.7% reside in traditional dwellings. Information on the percentage of informal dwellings was not available. Based on 2022 Census ~ 9% of the households resided in IDP or government subsidized housing.

In terms of household heads, approximately 50.12% of the households in the MM were headed by women. The high percentage of households headed by women reflects the limited employment opportunities and the likelihood that the men have left the area in search of employment opportunities in Gauteng. Women headed households tend to be more vulnerable.

Household income[9]

Based on the data from the 2011 Census, 11.6% of the population of the MM had no formal income, 6.5% earned less than R 4 800, 11.8% earned between R 5 000 and R 10 000 per annum, 25% between R 10 000 and R 20 000 per annum and 22.6% between R 20 000 and 40 000 per annum. The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 77.5% of the households in the MM live close to or below the poverty line. The low-income levels reflect the rural nature of the local economy and the limited formal employment opportunities outside in the urban areas. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the MM. This in turn impacts on the ability of the MM to maintain and provide services.

Household income levels are likely to have been impacted by the COVID-19 pandemic. The number of households in the MM and MM that live close to or below the poverty line is likely to have increased since the 2022 Census. This, coupled with the high dependency ratio, is a major cause of concern for the area.

Employment[10]

The official unemployment rate in the MM in 2011 was 14.9%, while 28.7% were employed, and 49.4% were regarded as not economically active. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in the MM.

[9] Data form the 2022 Census on household income was not available at the time of preparing the report.

[10] Data from the 2022 Census was not available at the time of preparing the report.

South Africa's unemployment rate was 32.1% in Q4 of 2023, while the youth unemployment rate was 43.4% in Q3 2023, the highest recorded youth employment rate in the world.

Education
In terms of education levels, the percentage of the population over 20 years of age in the MM with no schooling in 2022 was 16.2%, down from 18.2% in 2011. The percentage of the population over the age of 20 with matric in 2016 was 24.7%, up from 22.2% in 2011. The population over 20 years of age with a higher education qualification was 10.1% compared to 9.2% in 2011.

3.1 MUNICIPAL SERVICES-DPKISM

Electricity
Based on Census 2022, 95.7% of households in the MM had access to electricity compared to 89.4% in 2011.

Access to water
Based on Census 2022, only 26% of households in the MM had access to piped water inside their dwellings. 30.4% had piped water in the yard, but 31.8% had no access to piped water. This reflects the low service levels in terms of access to water at an individual household level.

Sanitation
Based on Census 2022, 29.7% of households in the MM had access to flush toilets, while 73% relied on pit latrines (ventilated and non-ventilated) and 1.7% of households had no access to any toilet facilities.

Refuse collection
Based on Census 2022, only 8.5% of households in the MM had their refuse removed on a weekly basis, while 6.9% used a communal refuse dump or collection point, and the majority, 80.1% used their own refuse dump. The high percentage of households that dispose of refuse at their own dump reflects the rural nature of the area.

3.2 OVERVIEW OF STUDY AREA[11]

The MM is located in the northern part of the Limpopo Province and covers an area of 8567.38 km². Most of the MM is rural (97.4%). The proposed PV SEF site is located approximately 37km to the southwest of Louis Trichardt, the administrative seat of the MM. The town of Polokwane, the administrative seat of the Limpopo Province is located ~ 63km to the southwest of the site. The site is located ~ 5km to the west of the N1 and 8.5 km west of the intersection between the N1 and R36 (Figure 3.2).

The Botlokwa/Machaka/Mphakane semi-rural urban node is located ~ 6.5-8 km to the south if the site (Figure 3.3). The node staddles the N1. As indicated above, the N1 provides a link with the node and the proposed Musina-Makhado located to the north. The proposed PV SEF would be able to provide renewable energy for the industries associated with the SEZ. The residents of the Botlokwa/Machaka/Mphakane node would also be in a position to benefit from employment opportunities associated with the construction and operation of the proposed PV SEF.

[11] The overview of the study area will be updated following the site visit during the Assessment Phase

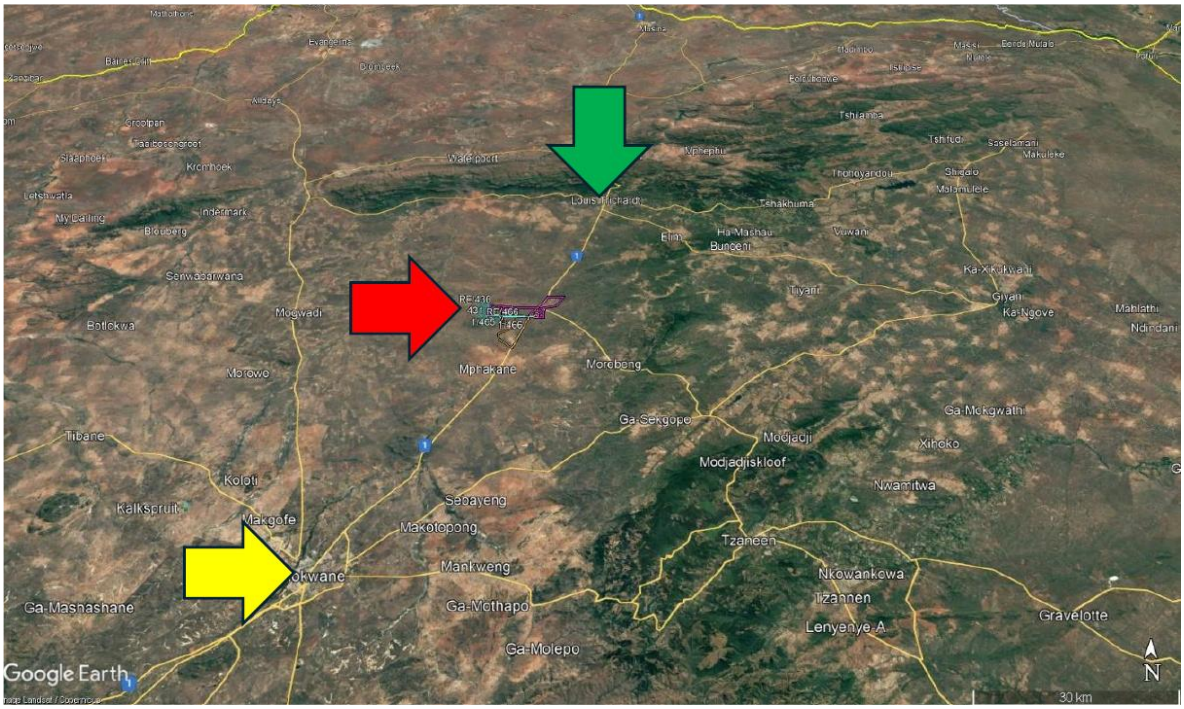


Figure 3.2: Location of site (red) relative to Louis Trichardt (green) and Polokwane (yellow)

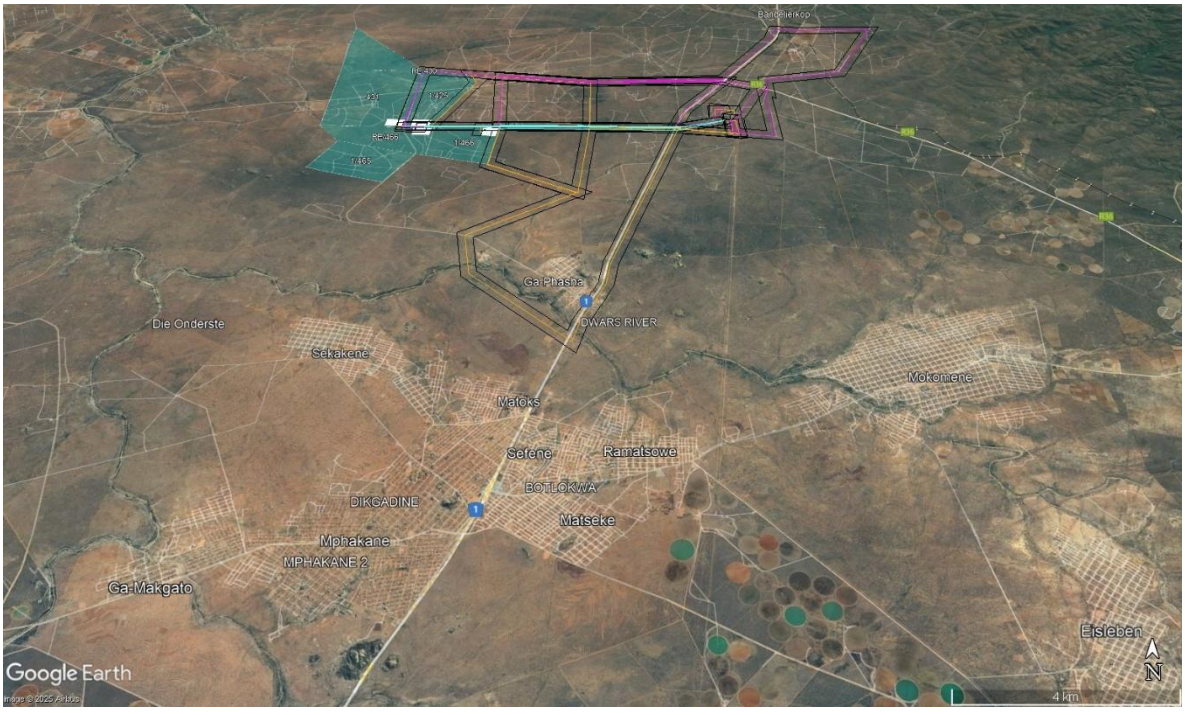


Figure 3.3: Location of Botlokwa/Machaka/Mphakane node to south of site

The land uses on and in the immediate vicinity of the site consist of open veld (Figure 3.4). Map 16, Rural Development and Transformation, of the MM SDF (p102) identifies the agricultural land use in the area as cattle farming (light yellow). However, there is extensive centre pivot irrigation to the south and southwest of the site (Figure 3.5). It is assumed that this is linked to the Dwars River located to the south and west of the

site. Based on the review of Google Earth there appear to be no socially sensitive land uses in the immediate vicinity of the site. This will be confirmed during the site visit.

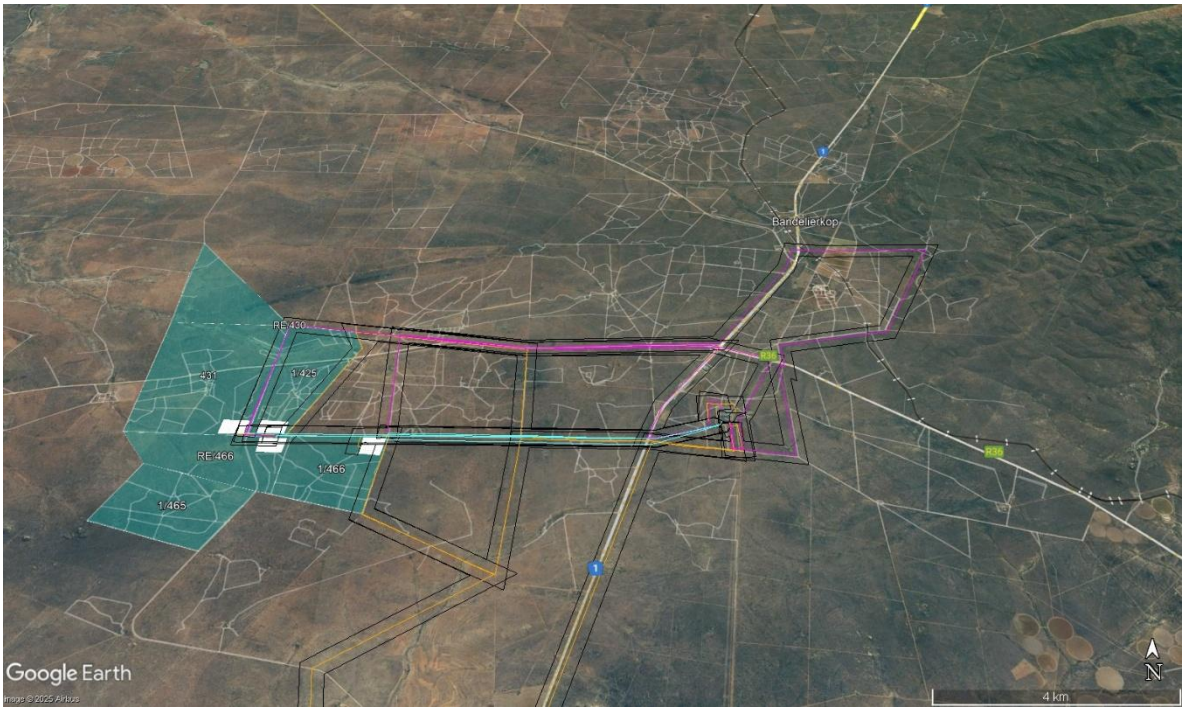


Figure 3.4: Land uses on and in the vicinity of the site

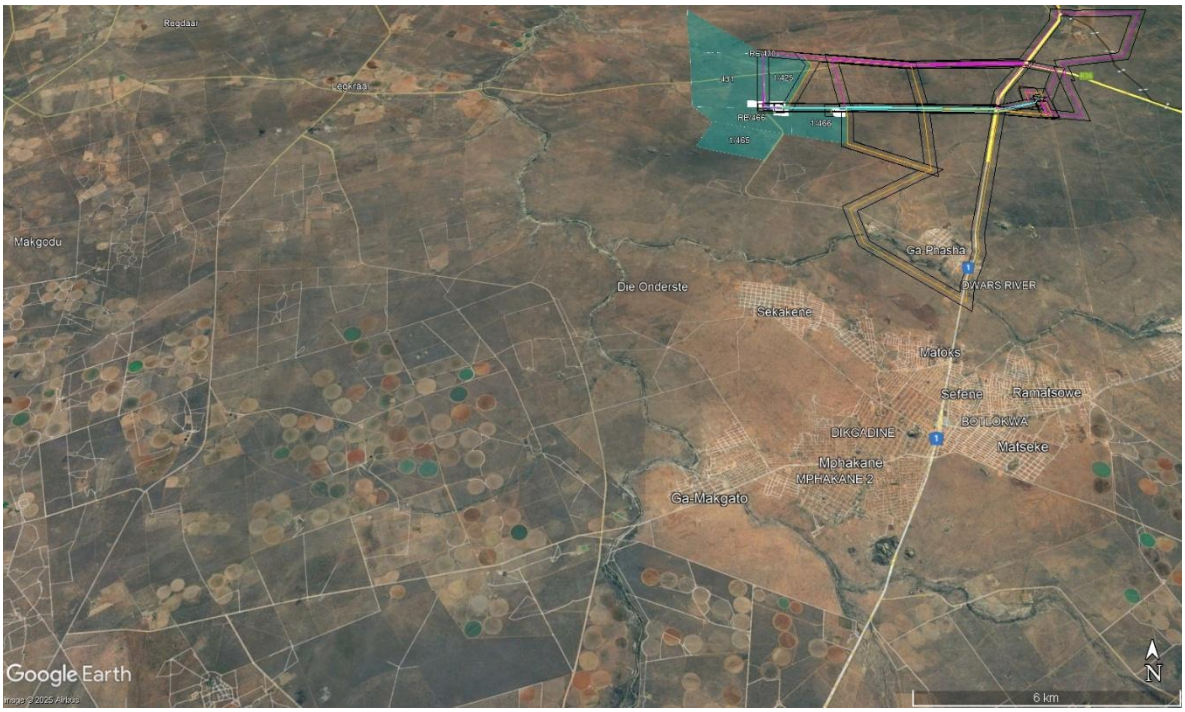


Figure 3.5: Centre pivot irrigation areas to south and west of site

SECTION 4: OVERVIEW OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

Section 4 provides an overview of key social issues identified that will be assessment during the Assessment Phase. The identification of key issues was based on:

- Review of project related information.
- Experience/ familiarity of the author with the area and local conditions.
- Experience with similar projects.

The section is divided into the following sections:

- Compatibility with relevant policy and planning context ("planning fit");
- Social issues associated with the construction phase.
- Social issues associated with the operational phase.
- Social issues associated with the decommissioning phase.
- Social implications of "no development" alternative.
- Social implications associated with cumulative impacts.

Section 4 also provides an overview of the approach (plan of study) for undertaking the specialist Social Impact Assessment (SIA) during the Assessment Phase.

4.2 ASSESSMENT OF POLICY AND PLANNING FIT

The development of and investment in renewable energy is supported by the National Development Plan (NDP) and National Infrastructure Plan, which all refer to and support renewable energy. The Limpopo Development Plan and MM SDF also support the development of renewable energy. The development of the proposed PV SEF is therefore supported by key policy and planning documents.

4.3 CONSTRUCTION PHASE SOCIAL IMPACTS

Potential positive impacts

- Creation of employment and business opportunities, and opportunity for skills development and on-site training.

Potential negative impacts

- Impacts associated with the presence of construction workers on local communities.
- Impacts related to the potential influx of job-seekers.
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site.
- Increased risk of grass fires associated with construction related activities.
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles.
- Impact on productive farmland.

4.3.1 Creation of local employment, training, and business opportunities

The construction phase will extend over a period of approximately 12 months and create in the region of 150 employment opportunities. Members from the local communities in the area, including the Botlokwa/Machaka/Mphakane node, would be in a position to

qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. Based on information from similar projects the total wage bill will be in the region of R 30 million (2025 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The capital expenditure will be approximately R 1.2 billion (2025 Rand value).

Due the lack of diversification in the local economy the potential for local companies is likely to be limited. The majority of benefits are therefore likely to accrue to contractors and engineering companies based outside the MM. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

The hospitality industry in the area will also benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

Table 4.1: Impact assessment of employment and business creation opportunities during the construction phase

<table>
<tr><td colspan="4">Nature: Creation of employment and business opportunities during the construction phase</td></tr>
<tr><th>Issue</th><th>Nature of Impact</th><th>Extent of Impact</th><th>No-Go Areas</th></tr>
<tr><td>Creation of employment and business opportunities during the construction phase</td><td><u>Direct impacts:</u>
» Creation of temporary employment opportunities
» Creation of business and procurement opportunities
<u>Indirect impacts:</u>
» Support for local economy.
» Creation of training and skills development opportunities</td><td>Local-Regional</td><td>N/A</td></tr>
<tr><td colspan="4">Description of expected significance of impact
Evidence from the other renewable energy projects indicates that the construction phase of 100 MW SEF will extend over a period of approximately 18 months and create in the region of 250 employment opportunities. Members from the local communities in the area, including the Botlokwa/Machaka/Mphakane node, would be in a position to qualify for the low skilled and semi-skilled opportunities. The business-related opportunities will be linked to the hospitality (accommodation) and services sector (catering, security, transport etc.).</td></tr>
<tr><td colspan="4">Gaps in knowledge & recommendations for further study
» Collection of information on local skills and education levels.
» Collection of information on local hospitality and services sector.
Recommendations with regards to general field surveys
» Site visit and interviews with representatives from local municipality, and the hospitality and services sector.
» Site visit and interviews with local chamber of commerce.</td></tr>
</table>

4.3.2 Impact of construction workers on local communities

The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to potentially risky behaviour, mainly of male construction workers, including:

- An increase in alcohol and drug use.
- An increase in crime levels.
- The loss of girlfriends and/or wives to construction workers.
- An increase in teenage and unwanted pregnancies.
- An increase in prostitution.
- An increase in sexually transmitted diseases (STDs), including HIV.

The proponent has indicated that workers will be accommodated on site.

The objective will be to source as many of the low and semi-skilled workers locally. These workers will be from the local community and form part of the local family and social networks. This will reduce the risk and mitigate the potential impacts on the local community. The balance of semi-skilled and skilled workers will be accommodated in the nearby towns of Polokwane and Louis Trichardt.

The total number of construction workers employed, and duration of the construction phase will depend on the timing and phasing of the timing and phasing of the construction of each of the five components of the project. This will have a bearing on the potential impact on local communities and services. This information will be collected as part of the assessment phase.

Table 4.2: Assessment of impact of the presence of construction workers in the area on local communities

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential impacts on family structures and social networks associated with the presence of construction workers	Direct impacts: » Disruption of existing family structures and social networks » Anti-social behaviour of construction workers » Increase in substance abuse, crime, sexually transmitted diseases. » Unplanned pregnancies Indirect impacts: » Impact on psychological well-being of local communities.	Local-Regional	N/A

	» Resentment of outsiders and tension within local communities		
Description of expected significance of impact Evidence from the other renewable energy projects indicates that presence and behaviour of construction workers can impact negatively on local communities. Members from the local communities in the area, Botlokwa/Machaka/Mphakane node,, would be at potential risk depending on where non-local construction workers are accommodated during the construction phase.			
Gaps in knowledge & recommendations for further study » Collection of information on local skills and education levels. Employing local community members reduces the potential risks » Collection of information on accommodation options and capacity. » Collection of information on existing community challenges and needs. **Recommendations with regards to general field surveys** » Site visit and interviews with representatives from local municipality and community representatives. » Site visit and interviews with representatives from hospitality sector with regard to accommodation options.			

4.3.3 Influx of job seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed project on its own does not constitute a large construction project, the establishment of a number of renewable energy projects in the area may attract job seekers to the area. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact. However, the way in which they conduct themselves can impact on the local community. The main areas of concern associated with the influx of job seekers include:

- Impacts on existing social networks and community structures.
- Competition for housing, specifically low-cost housing.
- Competition for scarce jobs.
- Increase in incidences of crime.

These issues are similar to the concerns associated with the presence of construction workers and are discussed in Section 4.3.1. The potential for economically motivated in-migration and subsequent labour stranding is likely to be negligible. This is due to the isolated location of the area and the limited economic and employment opportunities in the Botlokwa/Machaka/Mphakane node.

The total number of construction workers employed, and duration of the construction phase will depend on the timing and phasing of the construction of the project components. This information will be collected as part of the assessment phase.

Table 4.3: Assessment of impact of job seekers on local communities

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential impacts on family structures, social networks and community services associated with the influx of job seekers	Direct impacts: » Disruption of existing family structures and social networks » Anti-social behaviour of construction workers » Increase in substance abuse, crime, sexually transmitted diseases. » Unplanned pregnancies » Pressure on local services Indirect impacts: » Impact on psychological well-being of local communities. » Resentment of outsiders and tension within local communities	Local-Regional	N/A
Description of expected significance of impact Evidence from the other renewable energy projects indicates that the construction phase can result in the influx of jobseekers to the area and that this has the potential to impact negatively on local communities. However, the potential for the influx of jobseekers is also influenced by the location of the project. Projects located in relatively remote, rural areas are less likely to attract jobseekers			
Gaps in knowledge & recommendations for further study » Collection of information on existing community challenges and needs. **Recommendations with regards to general field surveys** » Site visit and interviews with representatives from local municipality and community representatives.			

4.3.4 Risk to safety and security of landowners, workers and livestock

The presence on and movement of construction workers on and off the site poses a potential safety and security threat to landowners and workers on and in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged, or stock theft linked either directly or indirectly to the presence of construction workers on the site. The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by careful planning and managing the movement of construction workers on and off the site workers during the construction phase.

Table 4.4: Assessment of risk to safety, livestock, and damage to farm infrastructure

Nature: Potential risk to farmers and farm workers, livestock and damage to farm infrastructure associated with the presence and activities of construction workers on site			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential risk to safety of scholars, farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site	Direct impacts: » Damage of gates, fences, etc. » Injuries to and loss of livestock » Break-ins, and theft of from local farms. » Damage of local farm roads. Indirect impacts: » Exposure to outside people of farming operations and risk to farming operations. » Increased risk of stock-theft.	Local	N/A
Description of expected significance of impact Evidence from the other renewable energy projects indicates that the movement and activities of construction workers can impact safety and security and on farming operations. The impacts include damage to fences and gates, gates being left open resulting in loss of livestock, increased risk of petty theft and stock theft etc.			
Gaps in knowledge & recommendations for further study » Collection of information on existing farming operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local farming associations etc.			

4.3.5 Increased risk of grass fires

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, wildlife and farm infrastructure. The potential risk of grass fires will be higher during the dry, windy winter months from May to October. The impacts will be largely local and can be effectively mitigated.

Table 4.5: Assessment of impact of increased risk of grass fires

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires	Direct impacts: » Damage of structures, grazing, gates, fences, etc. » Injuries to and loss of livestock Indirect impacts: » Impact on stocking levels and future farming operations. » Increased risk of stock losses and theft.	Local	N/A
Description of expected significance of impact Evidence from the other renewable energy projects indicates that the activities associated with the construction phase can increase the risk of grass fires, which in turn can impact on farming operations. The impacts include loss of grazing, damage to structures, fences, and gates, etc. These impacts impact on the livelihood of farmers.			
Gaps in knowledge & recommendations for further study » Collection of information on existing farming operations and activities, and risk of grass fires in the area. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local farming associations etc.			

4.3.6 Nuisance impacts associated with construction related activities

Construction related activities, including the movement of heavy construction vehicles of and on the site, has the potential to create dust, noise and safety impacts and damage to local internal roads. The impacts will be largely local (confined to the site) and can be effectively mitigated.

Table 4.6: **Assessment of the impacts associated with construction related activities**

Nature: Potential noise, dust and safety impacts associated with construction related activities			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Potential noise, dust and safety impacts associated with construction related activities	Direct impacts: » Dust impacts, and impact on quality of life and also crops and grazing. » Noise impacts, and impact on quality of life. » Safety of farmers due to movement of construction vehicles » Damage of local farm roads.	Local	N/A

	Indirect impacts: » Limited indirect impacts		
Description of expected significance of impact Evidence from the other renewable energy projects indicates that the activities associated with the construction phase do result in dust, noise and safety impacts that can impact on local farmers and farm workers.			
Gaps in knowledge & recommendations for further study » Collection of information on existing farming operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local farming associations etc.			

4.3.7 Impacts associated with loss of farmland

The activities associated with the construction phase and establishment of the proposed project and associated infrastructure will result in the disturbance and loss of land available for grazing. The impact on farmland associated with the construction phase can be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. In addition, the landowner will be compensated for the loss of land.

Table 4.7: Assessment of impact on farmland due to construction related activities

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Damage to farmland and loss of grazing and or crops	Direct impacts: » Loss of grazing and or crops Indirect impacts: » Impact on future farming operations. » Impact on employment opportunities on the farm.	Local	N/A
Description of expected significance of impact Evidence from the other renewable energy projects indicates that the activities associated with the construction phase will result in the loss of farmland, including grazing and or crops depending on the location. These impacts impact on the livelihood of farmers. However, loss of land and crops can be addressed by minimising the disturbance footprint and compensation for losses.			
Gaps in knowledge & recommendations for further study » Collection of information on existing farming operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local farming associations etc.			

4.4 OPERATIONAL PHASE SOCIAL IMPACTS

Potential positive impacts
- The establishment of infrastructure to improve energy security and support renewable sector.
- Creation of employment opportunities.
- Benefits to the affected landowners.
- Benefits associated with the socio-economic contributions to community development.

Potential negative impacts
- Visual impacts and associated impacts on sense of place.
- Impact on property values.
- Impact on tourism.

4.4.1 Improve energy security and support the renewable energy sector

The primary goal of the proposed project is to improve energy security in South Africa by generating additional energy. The proposed PV SEF will also reduce the carbon footprint associated with energy generation. The project should therefore be viewed within the context of the South Africa's current reliance on coal powered energy to meet the majority of its energy needs, and secondly, within the context of the success of the REIPPPP.

Table 4.8: Improve energy security and support renewable sector

Nature: Development of infrastructure to improve energy security and support renewable sector			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Improve SAs energy security and reduce reliance on coal	Direct impacts: » Improve energy security » Reduce reliance on coal. » Support renewable energy Indirect impacts: » Address climate change impacts	Local-International	N/A
Description of expected significance of impact South Africa's energy crisis, which started in 2007 and is ongoing, has resulted in widespread rolling blackouts (referred to as load shedding) due to supply shortfalls. The load shedding has had a significant impact on all sectors of the economy and on investor confidence. A review of the REIPPPP and establishment of renewable energy facilities not only addresses environmental issues associated with climate change and consumption of scarce water resources, but also create significant socio-economic opportunities and benefits, specifically for historically disadvantaged, rural communities.			
Gaps in knowledge & recommendations for further study » Collection and review of information on REIPPPP. **Recommendations with regards to general field surveys** » N/A. Desktop review of REIPPPP.			

4.4.2 Creation of employment opportunities

The proposed development will create ~ 20-30 full time employment opportunities during the operational phase, of which 70% will be unskilled, 25% semi-skilled 25%,

and 5% skilled 5%. Based on similar projects the annual operating budget will be in the region of R 25 million (2025 Rand values), including wages.

Table 4.9: Assessment of employment and business creation opportunities

Nature: Creation of employment and business opportunities associated with the operational phase			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Creation of employment and business opportunities associated with the operational phase	Direct impacts: » Creation of employment opportunities » Creation of business and procurement opportunities Indirect impacts: » Support for local economy. » Creation of training and skills development opportunities	Local-Regional	N/A
Description of expected significance of impact The direct employment opportunities associated with the operational phase of renewable energy projects are relatively limited. However, a review of the REIPPPP indicates that the benefits associated with the operation of renewable energy projects are significant and extend beyond direct employment opportunities.			
Gaps in knowledge & recommendations for further study » Collection and review of information on REIPPPP. **Recommendations with regards to general field surveys** » N/A. Desktop review of REIPPPP.			

4.4.3 Generate income for project landowners

The proponent will enter into rental agreements with the affected landowners for the use of the land for the establishment of the proposed PV SEF. In terms of the rental agreement the affected landowner will be paid an annual amount dependent upon the area affected. The additional income will reduce the risk to his livelihoods posed by droughts and fluctuating market prices for farming inputs, such as fuel, feed etc. Given the low carrying capacity of the veld the additional income represents a significant benefit for the affected landowner.

Table 4.10: Assessment of benefits associated with income generated for the project landowners

Nature: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for farming inputs, such as fuel and feed etc.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Generation of additional income for affected landowners	Direct impacts: » Additional income to support farming Indirect impacts: » Opportunity to invest and expand farming operations and create more employment opportunities on the farm.	Local	N/A
Description of expected significance of impact Evidence from the other renewable energy projects indicates that the generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for farming inputs etc.			
Gaps in knowledge & recommendations for further study » Collection of information on existing farming operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local farming associations etc.			

4.4.4 Benefits associated with the socio-economic development contributions

The REIPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership. Socio-economic development (SED) contributions are an important focus of the REIPPPP and are aimed at ensuring that local communities benefit directly from the investments attracted into the area. These contributions are linked to Community Trusts and accrue over the project operation life and, in so doing, create an opportunity to generate a steady revenue stream over an extended period. This revenue can be used to fund development initiatives in the area and support the local community. The long-term duration of the revenue stream also allows local municipalities and communities to undertake long term planning for the area.

Table 4.11: Assessment of benefits associated with socio-economic development contributions

Nature: Benefits associated with support for local community's form SED contributions			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Support for local economic development and investment	Direct impacts: » Support local economic development » Create employment opportunities » Create skills development and training opportunities » Improve basic services Indirect impacts: » Up-grade local municipalities and improve quality of life of local communities	Local-Regional	N/A
Description of expected significance of impact The revenue from the proposed SEF can be used to support a number of social and economic initiatives in the area, including: • Creation of jobs. • Education. • Support for and provision of basic services. • School feeding schemes. • Training and skills development. • Support for SMME's.			
Gaps in knowledge & recommendations for further study » Collection and review of information on REIPPPP. **Recommendations with regards to general field surveys** » N/A. Desktop review of REIPPPP.			

4.4.5 Visual impact and impact on sense of place

The proposed PV SEF has the potential to impact on the areas existing rural sense of place. Based on an initial assessment of the location, the potential impact on the area's sense of place is likely to be limited. This will be confirmed during the assessment phase and the findings of the Visual Impact Assessment (VIA).

Table 4.12: Visual impact and impact on sense of place

Nature: Visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Impact on rural sense of place	Direct impacts: » Change in rural sense of place Indirect impacts: » Potential impact on property values and hospitality operations.	Local	N/A
Description of expected significance of impact Renewable energy projects do have the potential to impact on an areas sense of place. In some instances, this has potential to impact on existing or proposed tourist facilities and also on property values. In other cases, local landowners have indicated that the potential visual impacts are not regarded as an issue.			
Gaps in knowledge & recommendations for further study » Collection of information on location of existing farming and hospitality operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local municipality and farming and hospitality associations etc.			

4.4.6 Potential impact on property values

The potential visual impacts associated with the proposed PV SEF have the potential to impact on property values. Based on the results of a literature review undertaken for wind farms, the potential impact on property values in rural areas is likely to be limited. In this regard a study undertaken in Australia in 2016 (Urbis Pty Ltd) found that:

- Appropriately located wind farms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values.
- There is limited available sales data to make a conclusive finding relating to value impacts on residential or lifestyle properties located close to wind farm turbines, noting that wind farms in NSW have been constructed in predominantly rural areas.

The impact of PV SEFs on property values is likely to be lower than the impact of WEFs due to the reduced visual impact. Based on the findings of the initial review of the site and the surrounding land uses the potential impact on property values is likely to be limited. This will be confirmed based on the findings of the site visit and the VIA.

Table 4.13: Assessment of potential impact on property values and operations

Nature: Potential impact of the REF on property values. This is usually linked to the visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Impact on rural sense of place and associated impact on property values.	Direct impacts: » Change in rural sense of place and impact on property values Indirect impacts: » Potential impact on hospitality operations.	Local	N/A
Description of expected significance of impact Renewable energy projects do have the potential to impact on an areas sense of place. In some instances, this can impact on property values. In other cases, local landowners have indicated that the potential visual impacts and impact on property values are not regarded as an issue.			
Gaps in knowledge & recommendations for further study » Collection of information on location of existing farming and hospitality operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local municipality and farming and hospitality associations etc.			

4.4.7 Potential impact on tourism

The potential visual impacts associated with the PV SEF have the potential to impact tourism facilities and tourism in the area. Based on the initial review of the site there are no tourism facilities or sensitive land uses located in the vicinity of the site that would be affected. The proposed PV SEF is therefore unlikely to impact tourism facilities in the area and or the MM. The findings will be confirmed during the Assessment Phase.

Table 4.14: Impact on tourism in the region

Nature: Potential impact of REF on local tourism. This is usually linked to the visual impact associated with the proposed facility and associated infrastructure and the potential impact on the areas rural sense of place.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Impact on existing and future tourism operations.	Direct impacts: » Change in rural sense of place and impact on tourism activities. Indirect impacts: » Potential impact on future development of hospitality operations.	Local	N/A
Description of expected significance of impact Renewable energy projects do have the potential to impact on an areas sense of place. In some instances, this can impact on tourism activities. In other cases, local landowners have indicated that the potential visual impacts and impact on tourism activities are not regarded as an issue.			
Gaps in knowledge & recommendations for further study			

» Collection of information on location of existing farming and hospitality operations and activities.

Recommendations with regards to general field surveys

» Site visit and interviews with local farmers and representatives from local municipality and farming and hospitality associations etc.

4.5 CUMULATIVE IMPACT ON SENSE OF PLACE

The potential cumulative impacts on the area's sense of place will be largely linked to potential visual impacts. In this regard the Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues are also likely to be relevant to solar facilities and associated infrastructure. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more solar or wind farms will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more solar or wind farms along a single journey, e.g. road or walking trail).
- The visual compatibility of different solar or wind farms in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The guidelines also note that cumulative impacts need to be considered in relation to dynamic as well as static viewpoints. The experience of driving along a tourist road, for example, needs to be considered as a dynamic sequence of views and visual impacts, not just as the cumulative impact of several developments on one location. The viewer may only see one renewable energy facility and the associated infrastructure at a time, but if each successive stretch of the road is dominated by views of renewable energy facilities, then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010).

As indicated above, the potential of the proposed PV SEF and associated infrastructure on the areas sense of place is likely to be limited. However, the cumulative impacts associated with the combined project are likely to higher. This will be confirmed during the assessment phase and the findings of the Visual Impact Assessment (VIA).

Table 4.15: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of more than one REF and the potential impact on the area's rural sense of place and character of the landscape.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Cumulative impact on rural sense of place	Direct impacts: » Change in rural sense of place Indirect impacts: » Potential impact on property values and hospitality operations.	Local-Regional	N/A
Description of expected significance of impact The establishment of renewable energy projects do have the potential to have a cumulative impact on an areas sense of place. The significance will depend on the location and number of REFs proposed. This will be informed by the findings from the site visit and review of the VIA.			
Gaps in knowledge & recommendations for further study » Collection of information on location of existing farming and hospitality operations and activities. **Recommendations with regards to general field surveys** » Site visit and interviews with local farmers and representatives from local municipality and farming and hospitality associations etc.			

4.6 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The establishment of the proposed development has the potential to place pressure on local services and accommodation, specifically during the construction phase. The objective will be to source as many low and semi-skilled workers for the construction phase from the MM. This will reduce the pressure on local services and accommodation and the nearby towns of Polokwane and Louis Trichardt.

The total number of construction workers that require accommodation will depend on the timing and phasing of the construction of the individual PV SEFs associated with the project. This information will be collected as part of the assessment phase. The capacity of accommodate workers will be addressed during the assessment phase.

The potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and associated renewable energy projects in the MM. These benefits will create opportunities for investment in the MM, including the opportunity to up-grade and expand existing services and the construction of new houses.

Table 4.16: Cumulative impacts on local services

Nature: The establishment of a number of renewable energy facilities and associated projects, such as the proposed SEF, in the MM has the potential to place pressure on local services, specifically medical, education and accommodation			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Cumulative impact on local services, including accommodation, medical and emergency services	Direct impacts: » Pressure on available services (medial, emergency etc.) » Pressure on available accommodation. Indirect impacts: » Potential impact on rentals and cost of services.	Local-Regional	N/A
Description of expected significance of impact The establishment of renewable energy projects do have the potential to have a cumulative impact on local services, specifically accommodation and emergency services. The significance will depend on the number of REFs proposed and timing of construction.			
Gaps in knowledge & recommendations for further study » Collection of information on number REFs proposed and timing of construction phase. **Recommendations with regards to general field surveys** » Site visit and interviews with local municipal officials and representatives from hospitality associations etc.			

4.7 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of the proposed development and associated infrastructure will also create several socio-economic opportunities for the MM. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities.

The potential cumulative benefits for the local and regional economy are associated with both the construction and operational phase of renewable energy projects and associated infrastructure and extend over a period of 20-25 years. However, steps must be taken to maximise employment opportunities for members from the local communities in the area and support skills development and training programmes.

Table 4.17: Cumulative impacts on local economy

Nature: The establishment of renewable energy facilities and associated projects, such as the SEF, in the MM will create employment, skills development and training opportunities, creation of downstream business opportunities.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Cumulative benefits in terms of creating employment, business, and skills development opportunities for the local municipality	Direct impacts: » Creation of employment, business, and skills development opportunities for the local municipality Indirect impacts: » Support local economic development.	Local-Regional	N/A
Description of expected significance of impact The establishment of renewable energy projects do have the potential to create benefits in terms of creating employment, business, and skills development opportunities for the local municipality. The significance will depend on the number of REFs proposed and timing of construction.			
Gaps in knowledge & recommendations for further study » Collection of information on number REFs proposed and timing of construction phase. **Recommendations with regards to general field surveys** » Site visit and interviews with local municipal officials and representatives from hospitality associations etc.			

4.8 ASSESSMENT OF NO-DEVELOPMENT OPTION

The primary goal of the Project is to assist in providing additional capacity to Eskom to assist in addressing the current energy supply constraints. The project also aims to reduce the carbon footprint associated with energy generation. As indicated above, energy supply constraints and the associated load shedding have had a significant impact on the economic development of the South African economy. South Africa also relies on coal-powered energy to meet more than 90% of its energy needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement is current energy needs with clean, renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a significant negative social cost.

Table 4.18: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to improve energy security and assist to support with the development of clean, renewable energy.			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Lost opportunity to improve energy security and develop clean, renewable energy	Direct impacts: » Energy security » Creation of employment, business, and skills development opportunities for the local municipality Indirect impacts: » Address climate change.	Local-Regional	N/A
Description of expected significance of impact The establishment of renewable energy projects will improve energy security and create benefits in terms of creating employment, business, and skills development opportunities. These benefits would be foregone if the REF is not developed.			
Gaps in knowledge & recommendations for further study » Collection and review of information on REIPPPP. **Recommendations with regards to general field surveys** » N/A. Desktop review of REIPPPP.			

4.9 PLAN OF STUDY FOR SIA

The proposed approach to the SIA is based on the Guidelines for SIA endorsed by Western Cape Provincial Environmental Authorities (DEA&DP) in 2007. The Guidelines are based on accepted international best practice guidelines, including the Guidelines and Principles for Social Impact Assessment (Inter-organizational Committee on Guidelines and Principles for Social Impact Assessment, 1994) and IAIA Guidance for Assessing and Managing Social Impacts (2015). The approach to the study will involve:

- Collection and review of reports and baseline socio-economic data on the area. This includes socio-economic characteristics of the affected areas, current and future land uses, and land uses planning documents relating to the study area and surrounds.
- Identification of the components associated with the construction and operational phase of the proposed project, including estimate of total capital expenditure, number of employment opportunities created and breakdown of the employment opportunities in terms of skill levels (low, medium and high skilled), breakdown of wages per skill level, assessment procurement policies etc.
- Site visit and interviews with key affected parties, including local communities, local landowners, key government officials (local and regional), the client, local farmers associations, tourism and conservation officials, chamber of commerce etc.
- Review of key findings of the key specialist studies that have a bearing on the SIA, such as the Visual Impact Assessment (VIA). This information will also be used to inform the engagement with the affected landowners.
- Identification and assessment of key social issues and assessment of potential impacts (negative and positive) associated with the construction, operational and decommissioning phase of the project.
- Identification and assessment of cumulative impacts (positive and negative).
- Identification of appropriate measures to avoid, mitigate, enhance and compensate for potential social impacts.
- Preparation of Social Impact Assessment (SIA) Report.

The site visit will be undertaken during the Assessment Phase of the SIA. The site visit will include interviews with key stakeholders and interested and affected parties.

ANNEXURE A

REFERENCES

- The National Energy Act (2008).
- The National Development Plan (2011).
- The White Paper on Energy Policy (1998).
- The White Paper on Renewable Energy (2003).
- National Infrastructure Plan (2012 /2021)
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- Climate Change Bill (2018 / 2021).
- Just Energy Transition Investment Plan (2023-2027).
- Limpopo Provincial Development Plan (2020-2025).
- Limpopo Provincial Spatial Development Framework (2022).
- Makhado Integrated Development Plan (2023-2024).
- Makhado Spatial Development Framework (2020).

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

Direct, indirect and cumulative impacts of the above issues, as well as all other issues identified will be assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, where it will be indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score between 1 and 5 will be assigned as appropriate (with a score of 1 being low and a score of 5 being high).
- The **duration**, where it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - medium-term (5–15 years) – assigned a score of 3;
  - long term (> 15 years) - assigned a score of 4; or
  - permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- The **status**, which will be described as either positive, negative or neutral.
- The *degree* to which the impact can be *reversed*.
- The *degree* to which the impact may cause *irreplaceable loss of reso*urces.
- The *degree* to which the impact can be *mitigated.*

The **significance** is determined by combining the criteria in the following formula:

S=(E+D+M)P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

ANNEXURE C

Tony Barbour
ENVIRONMENTAL CONSULTING

10 Firs Avenue, Claremont, 7708, South Africa
(Cell) 082 600 8266
(E-Mail) tony@tonybarbour.co.za

Tony Barbour's has 30 years' experience in the field of environmental consulting and management. His experience includes working for ten years as a consultant in the private sector followed by four years at the University of Cape Town's Environmental Evaluation Unit. He has worked as an independent consultant since 2004, with a key focus on Social Impact Assessment. His other areas of interest include Strategic Environmental Assessment and review work.

EDUCATION

- BSc (Geology and Economics) Rhodes (1984).
- B Economics (Honours) Rhodes (1985).
- MSc (Environmental Science), University of Cape Town (1992).

EMPLOYMENT RECORD

- Independent Consultant: November 2004 – current.
- University of Cape Town: August 1996-October 2004**:** Environmental Evaluation Unit (EEU), University of Cape Town. Senior Environmental Consultant and Researcher.
- Private sector: 1991-August 2000: 1991-1996**:** Ninham Shand Consulting (Now Aurecon, Cape Town). Senior Environmental Scientist; 1996-August 2000: Steffen, Robertson and Kirsten (SRK Consulting) – Associate Director, Manager Environmental Section, SRK Cape Town.

LECTURING

- University of Cape Town: Resource Economics; SEA and EIA (1991-2004).
- University of Cape Town: Social Impact Assessment (2004-current).
- Cape Technikon: Resource Economics and Waste Management (1994-1998).
- Peninsula Technikon: Resource Economics and Waste Management (1996-1998).

RELEVANT EXPERIENCE AND EXPERTISE

Tony Barbour has undertaken in the region of 350 SIA's, including SIAs for infrastructure projects, dams, pipelines, and roads. All the SIAs include interacting with and liaising with affected communities. In addition, he is the author of the Guidelines for undertaking SIAs as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

Tony was also the project manager for a study commissioned in 2005 by the then South African Department of Water Affairs and Forestry for the development of a Social Assessment and Development Framework. The aim of the framework was to enable the Department of Water Affairs and Forestry to identify, assess and manage social impacts associated with large infrastructure projects, such as dams. The study also included the development of guidelines for Social Impact Assessment, Conflict Management, Relocation and Resettlement and Monitoring and Evaluation.

Countries with work experience include South Africa, Namibia, Angola, Botswana, Zambia, Lesotho, Swaziland, Ghana, Senegal, Nigeria, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan, Sudan, Rwanda and Armenia.

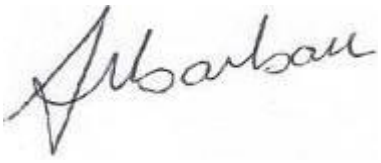
ANNEXURE D

The specialist declaration of independence in terms of the Regulations_

I, Tony Barbour , declare that --

General declaration:

I act as the independent specialist in this application;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
I will comply with the Act, Regulations and all other applicable legislation;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
all the particulars furnished by me in this form are true and correct;
and
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

Tony Barbour Environmental Consulting and Research

Name of company (if applicable):

16 April 2025

Date: