

SOCIAL IMPACT ASSESSMENT

CAMDEN II WIND ENERGY FACILITY

MPUMALANGA PROVINCE

JUNE 2022

Prepared for

WSP

by

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EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

WSP was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed up to 200 MW Camden II Wind Energy Facility (WEF) located approximately 14 km south of the town of Ermelo in the Msukaligwa Municipality in the Mpumalanga Province. Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an EIA process.

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 potential social impacts associated with the battery energy storage systems (BESS) and internal substations are negligible and do not have a bearing on the findings of the SIA. The focus of the SIA is therefore on the WEF and associated wind turbines.

FIT WITH POLICY AND PLANNING

The development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The development of renewable energy is also supported by the MMSDF. In this regard the SDF acknowledges the importance of the mining sector and notes that it will need to be accommodated over the short to medium term. However, of relevance to the proposed development the SDF refers to green industries and indicates that the existing site of the Camden Power Station and surrounds should be made available for new industrial development in the long term, to manage the long-term impact of the Power Station being decommissioned.

CONSTRUCTION PHASE

Potential positive impacts

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

The construction phase will extend over a period of approximately 18-24 months and create in the region of 100-150 employment opportunities. Members from the local communities in Ermelo and the MM would qualify for the majority of low skilled and semi-skilled employment opportunities and a number of skilled opportunities. The Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members from the local community. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if

localised, social benefit. The total wage bill will be in the region of R 25 million (2022 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in Ermelo and the MM. The capital expenditure associated with the construction phase will be approximately R 2-3 billion (2022 Rand value). This will create opportunities for local companies and the regional and local economy. Due to the presence of the mining and energy sector, there are likely to suitably qualified companies in Ermelo that can provide the required services and products. 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.

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.

The findings of the SIA indicate that the significance of the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts associated with the proposed construction phase can therefore be effectively mitigated if the recommended mitigation measures are implemented. Table 1 summarises the significance of the impacts associated with the construction phase.

Table 1: Summary of social impacts during construction phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Creation of employment and business opportunities	Medium (Positive)	Medium (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Medium (Negative)	Low (Negative)
Influx of job seekers	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Medium (Negative)	Low (Negative)
Increased risk of grass fires	Medium (Negative)	Low (Negative)
Impact of heavy vehicles and construction activities	Medium (Negative)	Low (Negative)
Loss of farmland	Medium (Negative)	Low (Negative)

OPERATION PHASE

The following key social issues are of relevance to the operational phase:

Potential positive impacts

- 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.

The proposed project will supplement South Africa's energy and assist to improve energy security. In addition, it will also reduce the country's reliance on coal as an energy source. This represents a positive social benefit.

Potential negative impacts

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

The findings of the SIA indicate that the significance of all the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts can therefore be effectively mitigated. The significance of the impacts associated with the operational phase are summarised in Table 2.

Table 2: Summary of social impacts during operational phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Establishment of infrastructure to improve energy security and support renewable sector	High (Positive)	High (Positive)
Creation of employment and business opportunities during maintenance	Low (Positive)	Medium (Positive)
Benefits associated with socio-economic contributions to community development	Medium (Positive)	Medium (Positive)
Benefits for landowners	Low (Positive)	Medium (Positive)
Visual impact and impact on sense of place	Low (Negative)	Low (Negative)
Impact on property values	Low (Negative)	Low (Negative)
Impact on tourism	Low (Negative)	Low (Negative)

CUMULATIVE IMPACTS

Cumulative impact on sense of place

The establishment of the Camden II WEF and other solar and wind energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the areas sense of place should be viewed within the context of the impact of the Camden Power Station and associated transmission lines on areas sense of place. The areas sense of place has also been impacted by large-sale coal mining operations. The potential visual impact on the areas sense place is therefore likely to be limited. In addition, none of the affected landowners interviewed raised concerns about potential visual impacts associated with the proposed project. The potential cumulative impact on the areas sense of place is therefore likely to be limited.

Cumulative impact on local services and accommodation

The potential cumulative impact on local services and accommodation will depend on the timing construction phases for the different renewable energy projects in the area. With effective planning the significance of the potential impact was rated as **Low Negative**.

Cumulative impact on local economy

The significance of this impact with enhancement was rated as **Moderate Positive**.

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 flexible and cleaner (compared to coal) 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 negative social cost.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings of the SIA indicate that the proposed up to 200 MW Camden II WEF project will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development through socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation. The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The up to 200 MW Camden II WEF is therefore supported by the findings of the SIA.

Recommendations

- The loss of high-quality agricultural land should be avoided where possible and or minimised by careful planning of the final layout of the proposed WEF facilities.
- Affected landowners should be notified about the timing of construction related activities in advance of the commencement of the construction phase.

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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 <i>curriculum vitae</i> ;	Section 1.5, Annexure A
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.6, Annexure B
(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;	Interviews in 2021 (Annexure A)
(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;	Section 4
(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;	Refer to Visual Impact Assessment (VIA)
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.4,
(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 description of any consultation process that was undertaken during the course of preparing the specialist report	Annexure A, lists key stakeholders interviewed
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Annexure A, lists key stakeholders interviewed
(q) 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	Comply with the Assessment Protocols that were

apply.	published on 20 March 2020, in Government Gazette 43110, GN 320. This specifically includes Part A, which provides the Site Sensitivity Verification Requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been prescribed. As at September 2020, there are no sensitivity layers on the Screening Tool for Socio-economic-features. Part A has therefore not been compiled for this assessment.
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ACRONYMS

BESS	Battery Energy Storage System
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DM	District Municipality
GSDM	Gert Sibanye District Municipality
HD	Historically Disadvantaged
EIA	Environmental Impact Assessment
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
MM	Msukaligwa Municipality
MW	Megawatt
SDF	Spatial Development Framework
SEF	Solar Energy Facility
SIA	Social Impact Assessment
WEF	Wind Energy Facility

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

WSP was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed up to 200 MW Camden II Wind Energy Facility (WEF) and associated infrastructure located approximately 14 km south of the town of Ermelo in the Msukaligwa Municipality (MM) in the Mpumalanga Province.

Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an EIA process.



Figure 1.1: Location of Camden II WEF study area

1.2 TERMS OF REFERENCE AND APPROACH

The approach to the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (DEADP, 2007). The key activities undertaken as part of the SIA process as embodied in the guidelines included:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), and the community, land uses and activities that may be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.

- Review of key policy and planning documents that have a bearing on the project.
- Site visit and interviews with key stakeholders.
- Identifying the key potential social issues associated with the proposed project.
- Assessing and assessing the significance of social impacts associated with the proposed project.
- Identification of enhancement and mitigation measures aimed at maximizing opportunities and avoiding and or reducing negative impacts.

1.3 PROJECT DESCRIPTION

The Camden II Wind Energy Facility (RF) Propriety Limited is proposing to develop the up to 200 MW Camden II Wind Energy Facility (WEF). Table 1.1 provides a list of the properties associated with the proposed up to 200 MW Camden II WEF.

Table 1.1: List of affected properties associated with Camden II Wind Energy Facility (WEF)

Parent Farm	Farm No	Portion No
Adrianople	296	0
Adrianople	296	1
Adrianople	296	2
Adrianople	296	3
Buhrmanvallei	297	3
Buhrmanvallei	297	4
De Emigrate	327	3
Buhrmanvallei	297	5
Klipfontein	326	5
De Emigrate	327	6

A wind energy facility (WEF) consists of multiple wind turbines which are used to capture the kinetic energy of the wind and generate electricity. This captured kinetic energy is used to drive a generator located within the wind turbine and the energy is subsequently converted into electrical energy. Photograph 1.1 illustrates a typical wind turbine which consists of four primary components.

- The **foundation unit** upon which the turbine is anchored to the ground.
- The **tower**, which is a hollow structure allowing access to the nacelle (see below). The height of the tower is a key factor in determining the amount of electricity a turbine can generate. The tower houses the transformer which converts the electricity to the correct voltage for transmission into the grid.
- The **nacelle** (generator/turbine housing). The nacelle is located at the top of the tower and houses the gearbox and generator as well as a wind sensor to identify wind direction. The nacelle turns automatically ensuring the blades always face into the wind to maximise the amount of electricity generated.
- The **rotor**, which is typically comprised of three rotor blades with a diameter varying between 100 and 200 m.

A battery energy storage system (BESS) will also be developed as part of the project. Photograph 1.2 illustrates an example of a BESS. Details of the Camden II WEF are summarised in Table 1.2.



Photograph 1.1: Typical example of wind turbine



Photograph 1.2: Example of BESS located in storage containers

Table 1.2: Camden II WEF Project Details

Capacity	Up to 200MW
Number of turbines	Up to 45
Turbine hub height:	Up to 200m
Rotor Diameter:	Up to 200m
Buildable area	Approximately 200 ha, subject to finalization based on technical and environmental requirements
Foundation	<ul style="list-style-type: none"> Concrete foundations of approximately of 25m diameter x 4.5m deep will be required for each turbine, requiring approximately 2500m³ concrete. Please note these dimensions may be larger as required by the geotechnical conditions. Concrete foundation will be constructed to support a mounting ring
Operations and Maintenance (O&M) building footprint:	<p>Located in close proximity to the substation. Septic/conservancy tanks with portable toilets Typical areas include:</p> <ul style="list-style-type: none"> Operations building – 20m x 10m = 200m² Workshop – 15m x 10m = 150m² Stores - 15m x 10m = 150m²
Construction camp laydown	<p>Typical area 100m x 50m = 5000m². Sewage: Septic/conservancy tanks and portable toilets</p>
Temporary laydown or staging area:	Typical area 220m x 100m = 22000m ² . Laydown area could increase to 30000m ² for concrete towers, should they be required.
Cement batching plant (temporary):	Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo.
Internal Roads:	Width of internal road – Between 5m and 6m. Length of internal road – Approximately 60km. Where required for turning circle/bypass areas, access or internal roads may be up to 20m to allow for larger component transport.
Cables:	The medium voltage collector system will comprise of cables up to and include 33kV that run underground, except where a technical assessment suggest that overhead lines are required, in the facility connecting the turbines to the onsite substation.
Independent Power Producer (IPP) site substation and battery energy storage system (BESS):	<p>Total footprint will be up to 6.5ha in extent (5ha for the BESS and 1.5ha for the IPP portion of the substation). The substation will consist of a high voltage substation yard to allow for multiple (up to) 132kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, and other substation components as required.</p> <p>The associated BESS storage capacity will be up to 200MW/800MWh with up to four hours of storage. It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, Lithium Nickel Manganese Cobalt oxides or Vanadium Redox flow technologies will be considered as the preferred battery technology however the specific technology will only be determined following EPC procurement. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers.</p>

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

Technical suitability

It is assumed that the development site represents a technically suitable site for the establishment of the proposed development.

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.

Assessment of components

The potential social impacts associated with the battery energy storage systems (BESS) and internal substations are negligible and do not have a bearing on the findings of the SIA. The focus of the SIA is therefore on the WEF and associated wind turbines.

1.4.2 Limitations

Demographic data

Some of the provincial documents do not contain data from the 2011 Census and or 2016 Household Community Survey. However, where required the relevant 2011 and 2016 data has been provided.

1.5 SPECIALIST DETAILS

Tony Barbour, the lead author of this report, is an independent specialist with 28 years' experience in the field of environmental management. In terms of SIA experience Tony Barbour has undertaken in the region of 260 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 Tony Barbour's CV.

Schalk van der Merwe, the co-author of this report, has an MPhil in Environmental Management from the University of Cape Town and has worked closely with Tony Barbour over the last seventeen years.

1.6 DECLARATION OF INDEPENDENCE

This confirms that Tony Barbour and Schalk van der Merwe, the specialist consultants responsible for undertaking the study and preparing the SIA Report, are independent and do not have any vested or financial interests in the proposed power line being either approved or rejected. Annexure D contains a signed declaration of independence.

1.7 REPORT STUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction.
- Section 2: Policy and planning context.
- Section 3: Overview of study area.
- Section 4: Identification and assessment of key issues.
- Section 5: Summary of key findings.

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 fit¹” 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 White Paper on the Energy Policy of the Republic of South Africa (December 1998).
- The White Paper on Renewable Energy (November 2003).
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- The National Development Plan (2011).
- Mpumalanga Spatial Development Framework (2019).
- Msukaligwa Municipality Integrated Development Plan (2019-2020).
- Msukaligwa Spatial Development Framework (2019).

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 was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar and wind:

“To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (...); to provide for (...) increased generation and consumption of renewable energies.”(Preamble).

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.

2.2.2 White Paper on the Energy Policy of the Republic of South Africa

Investment in renewable energy initiatives, such as the proposed SEF, 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.

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:

- Minimal environmental impacts in operation in comparison with traditional supply technologies.
- Generally lower running costs, and high labour intensities.

Disadvantages include:

- Higher capital costs in some cases.
- Lower energy densities.
- Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems.

2.2.3 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 Protocol², Government is determined to make good the country's commitment to reducing 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 IRP 2010 aims to allocate 43% of new energy generation facilities in South Africa to renewables.

Apart from the reduction of greenhouse gas emissions, the promotion of renewable energy sources is aimed at ensuring energy security through the diversification of supply (in this regard, also refer to the objectives of the National Energy Act).

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels.

2.2.4 Integrated Energy Plan (2016)

The development of a National Integrated Energy Plan (IEP) was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development.

The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives were identified, namely:

- Objective 1: Ensure security of supply.
- Objective 2: Minimise the cost of energy.
- Objective 3: Promote the creation of jobs and localisation.
- Objective 4: Minimise negative environmental impacts from the energy sector.
- Objective 5: Promote the conservation of water.

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).

- Objective 6: Diversify supply sources and primary sources of energy.
- Objective 7: Promote energy efficiency in the economy.
- Objective 8: Increase access to modern energy.

The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also consider the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others.

Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives.

As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios:

- The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term.
- The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy.
- The Resource Constrained Scenario in which global energy commodity prices (i.e., coal, crude oil, and natural gas) are high due to limited supply.
- The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met.

The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of renewable energy, the document refers to wind and solar energy. The document does however appear to support solar over wind noting that solar PV and CSP with storage present excellent opportunities to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Solar technologies also present the greatest potential for job creation and localisation. Incentive programmes and special focused programmes to promote further development in the technology, as well as solar roll-out programmes, should be pursued.

In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth.

By 2020, various import options become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The

main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs.

In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy.

An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered.

In terms of promoting job creation and localisation potential, the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained, Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution.

The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.

The IEP notes that a diversified energy mix with a reduced reliance on a single or a few primary energy sources should be pursued. In terms of renewable energy, wind and solar are identified as the key options.

Wind

Wind energy should continue to play a role in the generation of electricity. Allocations to ensure the development of wind energy projects aligned with the IRP2010 should continue to be pursued.

Solar

- Solar should play a much more significant role in the electricity generation mix than it has done historically and constitutes the greatest share of primary energy (in terms of total installed capacity) by 2050. The contribution of solar in the energy mix comprises both CSP and solar PV.
- Investments should be made to upgrade the grid in order to accommodate increasing solar and other renewable energy contributions.

With reference to the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), the IEP notes:

- The REIPPPP should be extended, and new capacity should be allocated through additional bidding windows in order ensure the ongoing deployment of renewable energy technologies.
- Experience and insights gained from the current procurement process should be used to streamline and simplify the process.

- The implementation of REIPPPP projects in subsequent cycles of the programme should be aligned with the spatial priorities of provincial and local government structures in the regions that are selected for implementation, in line with the Spatial Development Frameworks. This will ensure that there is long-term, sustainable infrastructure investment in the areas where REIPP projects are located. Such infrastructure includes bulk infrastructure and associated social infrastructure (e.g., education and health systems). This alignment will further assist in supporting the sustainable development objectives of provincial and local government by benefiting local communities.

The IEP indicates that Renewable Energy Development Zones (REDZs) have been identified and describe geographical areas:

- In which clusters (several projects) of wind and solar PV development will have the lowest negative impact on the environment while yielding the highest possible social and economic benefit to the country.
- That are widely agreed to have strategic importance for wind and solar PV development.
- Where the environmental and other authorisation processes have been aligned and streamlined based on scoping level pre-assessments and clear development requirements.
- Where proactive and socialised investment can be made to provide time-efficient infrastructure access.

2.2.5 Integrated Resource Plan

The integrated resource plan (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. On 6 May 2011, the Department of Energy (DoE) released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. The IRP 2010 was intended to be a 'living plan' that would be periodically revised by the DoE. However, this was never done and resulted in an energy mix that failed to adequately meet the constantly changing supply and demand scenarios in South Africa, nor did it reflect global technological advancements in the efficient and responsible generation of energy.

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.

Since the promulgated IRP 2010, the following capacity developments have taken place. A total 6 422MW under the government led Renewable Energy Independent Power Producers Programme (RE IPP Procurement Programme) has been procured, with 3 876MW currently operational and made available to the grid. In addition, IPPs have commissioned 1 005MW from two Open Cycle Gas Turbine (OCGT) peaking plants. Under the Eskom build programme, the following capacity has been commissioned: 1 332MW of Ingula pumped storage, 1 588MW of Medupi, 800MW of Kusile and 100MW of Sere Wind Farm. In total, 18 000MW of new generation capacity has been committed to.

Provision has been made for the following new additional capacity by 2030:

- 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.

Figure 2.1 provides a summary of the allocations and commitments between the various energy sectors.

	Coal	Coal (Decommissioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37,149		1 860	2,100	2 912	1 474	1 980	300	3 830	499
2019	2,155	-2,373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1,433	-557				114	300			
2021	1,433	-1403				300	818			
2022	711	-844			513	400	1,000	1,600		
2023	750	-555				1000	1,600			
2024			1,860				1,600		1000	500
2025						1000	1,600			500
2026		-1,219					1,600			500
2027	750	-847					1,600		2000	500
2028		-475				1000	1,600			500
2029		-1,694			1575	1000	1,600			500
2030		-1,050		2,500		1000	1,600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

Installed Capacity

Committed/Already Contracted Capacity

Capacity Decommissioned

New Additional Capacity

Extension of Koeberg Plant Design Life

Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030.
- Koeberg power station rated/installed capacity will revert to 1,926MW (original design capacity) following design life extension work.
- Other/ Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility.
- Short term capacity gap is estimated at 2,000MW.

Figure 2.1: Summary of energy allocations and commitments

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 four bidding rounds have been completed for renewable energy projects under the RE IPP Procurement Programme. The most dominant technology in the IRP2019 is renewable energy from wind and solar PV technologies, with wind being identified as the stronger of the two technologies. There is a consistent annual allocation of 1 600MW for wind technology commencing in the year 2022 up to 2030. The solar PV allocation of 1 000MWs per year is incremental over the period up to 2030, with no

allocation in the years 2024 (being the year the Koeberg nuclear extension is expected to be commissioned) and the years 2026 and 2027 (presumably since 2 000MW of gas is expected in the year 2027). The IRP 2019 states that although there are annual build limits, in the long run such limits will be reviewed to take into account demand and supply requirements.

2.2.6 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 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.

2.2.7 The New Growth Path Framework

The aim of the New Economic Growth Path Framework is to enhance growth, employment creation and equity. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard, the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.

The New Growth Path also identifies five other priority areas as part of the programme, through a series of partnerships between the State and the private sector. The Green Economy as one of the five priority areas to create jobs, including expansions in construction and the production of technologies for solar, wind and biofuels. In this regard, clean manufacturing and environmental services are projected to create 300 000 jobs over the next decade.

2.2.8 National Infrastructure Plan

The South African Government adopted a National Infrastructure Plan 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 plan also supports the integration of African economies. In terms of the plan, Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the 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 consist of:

- Five geographically-focussed SIPs.
- Three spatial SIPs.
- Three energy SIPs.
- Three social infrastructure SIPs.
- Two knowledge SIPs.
- One regional integration SIP.
- One water and sanitation SIP.

The three energy SIPS are SIP 8, 9 and 10.

SIP 8: Green energy in support of the South African economy

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010).
- Support bio-fuel production facilities.

SIP 9: Electricity generation to support socio-economic development

- Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances.
- Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula.

SIP 10: Electricity transmission and distribution for all

- Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.
- Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.

2.3 PROVINCIAL AND LOCAL LEVEL POLICY AND PLANNING

2.3.1 Mpumalanga Spatial Development Framework (2019)

The spatial vision for Mpumalanga Province is “A sustainable, vibrant and inclusive economy, Mpumalanga”. The SDF identifies a number of opportunities and challenges facing the province. The opportunities are linked to the province’s natural resources, well developed economy, and established economies.

Natural Environment: The natural environment is diversified and is associated with the Highveld and the Lowveld areas in the province. Five major rivers systems in the flow through Mpumalanga and it is an important catchment area.

Connectivity and Infrastructure: The province is well connected in terms of infrastructure and is connected to Maputo and Richards Bay ports by both rail and road.

Economy: The province’s rich biodiversity and scenic beauty support the tourism industry, while at the same time mining, specifically coal mining, plays a key role in the province’s economy. The availability of high potential soil and diverse climatic condition also support a range of crops.

Urban settlements: The key urban centres are well established economic centres and offer the opportunity for further economic development by leveraging on the towns’ economic bases.

In terms of challenges, climate change is identified as a key challenge. In this regard the activities in the province, specifically the generation of coal powered energy, account for 90% of South Africa’s scheduled emissions. The province is also home to 50% of the most polluted towns in the country. The predicted impacts associated with climate change include decreased rainfall in the province and increase temperatures. This will increase the risk of natural disasters, including droughts, flooding and fires.

The SDF identifies five spatial objectives, namely:

Connectivity and corridor functionality: The aim is to ensure connectivity between nodes, secondary towns, marginalised areas, the surrounding area, and to green open space systems.

Sustainable concentration and agglomeration: The aim is to promote the creation of an agglomeration economy that will encourage people and economic activities to locate near one another in urban centres and industrial clusters.

Conservation and resource utilisation: The aim is to promote the maximisation, protection and maintenance of ecosystems, scarce natural resources, high-potential agricultural land, and integrated open space systems.

Liveability and sense of place: The aim is to create settlements that contribute to people's sense of personal and collective wellbeing and to their sense of satisfaction in being residents of a settlements.

Rural diversity and transformation: The aim is to create Urban-Rural anchors and choices for residents within the rural economy linked to access to markets, food security and security of land tenure.

Connectivity and corridor functionality, Sustainable concentration and agglomeration, and Conservation and resource utilisation are of specific relevance the proposed development.

Connectivity and corridor functionality

The strategic objectives (SOs) that are relevant the study area and the proposed development include:

- Strategic Objective 2: Development of the existing corridors and building new linkages to increase capacity and economic opportunities and ensure connectivity to the surrounding areas
- Strategic Objective 5: Decongestion of the coal haul roads and Improvement of Freight Network

In terms of SO 2, the spatial linkages identified for development and upgrading include the upgrade of N17, N17/N2 Corridor and the N12 and N11 corridor. The site is flanked by the N2 to the north east and N11 to the south west.

Sustainable concentration and agglomeration

Of specific relevance, Strategic Objective 4, Diversify Economy, focusses on the need to diversify the economy. The SDF notes that mining sector contributes 25% to Mpumalanga's GVA. In addition, there are a number of other sectors directly or indirectly dependent on mining such as manufacturing (specifically metal processing) and utilities (specifically power generation). The combined GVA of these three sectors makes up more than 40% of the provincial GVA.

However, the SDF recognises that mining is not a sustainable industry and resources are finite. There is therefore a need for a gradual shift from mining-oriented sectors to the sustainable economic sectors to maintain sustained growth of the provincial economy. Mpumalanga's Coal Mining and Coal Fired Power Plant region (located mainly in the Highveld area) will be come under increasing pressure due to environmental considerations. As a result, the region is likely to experience a decline in demand for coal and with it a decline in

the associated employment it creates. There is therefore a need to diversify the regional economy and facilitate the gradual transition of economic activities in the region. The proposed development supports the objective of diversifying the provinces economy.

Conservation and resource utilisation

The strategic objectives (SOs) that are relevant the study area and the proposed development include:

- Strategic Objective 2: Ensure conservation of all water resources and catchment Areas.
- Strategic Objective 4: Promote a low carbon and climate resilient economy.
- Strategic Objective 6: To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment.

Strategic Objective 2: Ensure Conservation of all Water Resources and Catchment Areas

Achieving Strategic Objective 2, Ensure Conservation of all Water Resources and Catchment Areas is closely linked to diversifying the economy. The SDF notes that the provinces water resources are under pressure from high demand activities, including Eskom's power stations, mining, and industrial uses. The proposed development represents a low consumer of water.

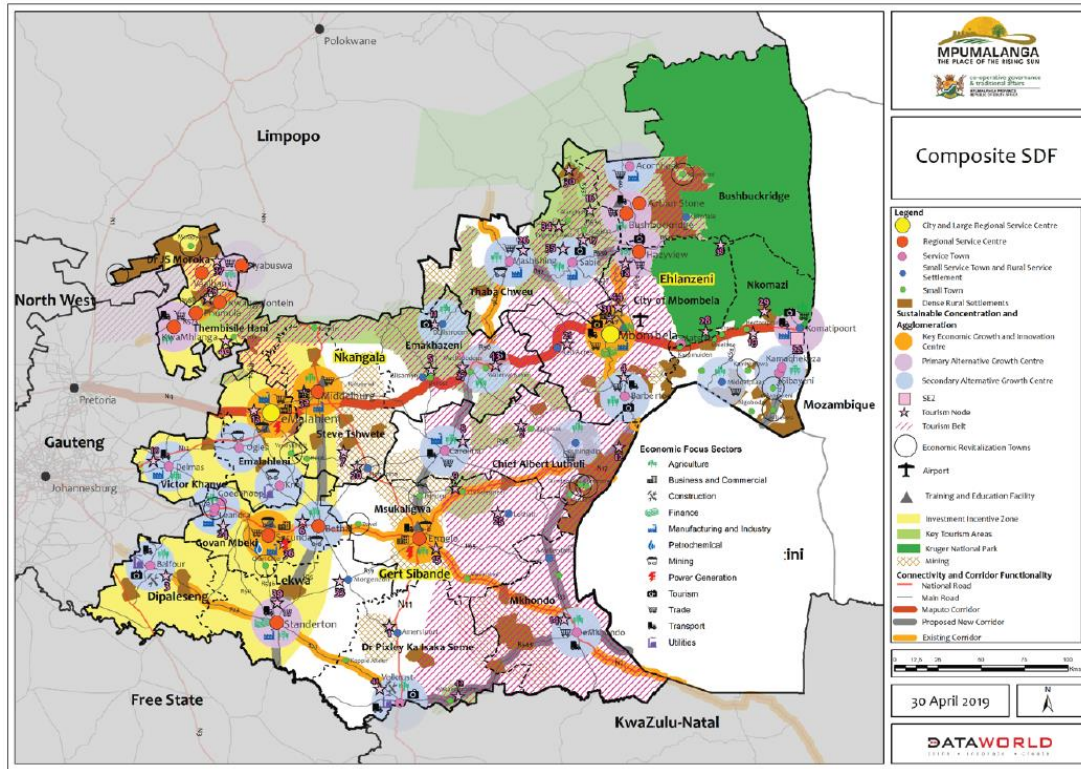
Strategic Objective 4: Promote a Low Carbon and Climate Resilient Economy

Mpumalanga is home to 12 of Eskom's 15 coal-fired power stations; petrochemical plants including Sasol's refinery in Secunda; metal smelters; coal and other mines; brick and stone works; fertiliser and chemical producers; explosives producers; and other smaller industrial operations, making the Highveld one of South Africa's industrial heartlands (CER, 2017). As a result, the air quality within the Mpumalanga Province, especially within the Highveld area, is the poorest in South Africa. The Highveld region accounts for approximately 90 % of South Africa's scheduled emissions of industrial dust, sulphur dioxide and nitrogen oxides (Wells et al. 1996, as cited in Josipovic et al. 2009). Achieving Strategic 4, Promote a low carbon and climate resilient economy, is closely linked to diversifying the economy. The proposed development supports the development of a low carbon, climate resistant economy.

Strategic Objective 6: To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment

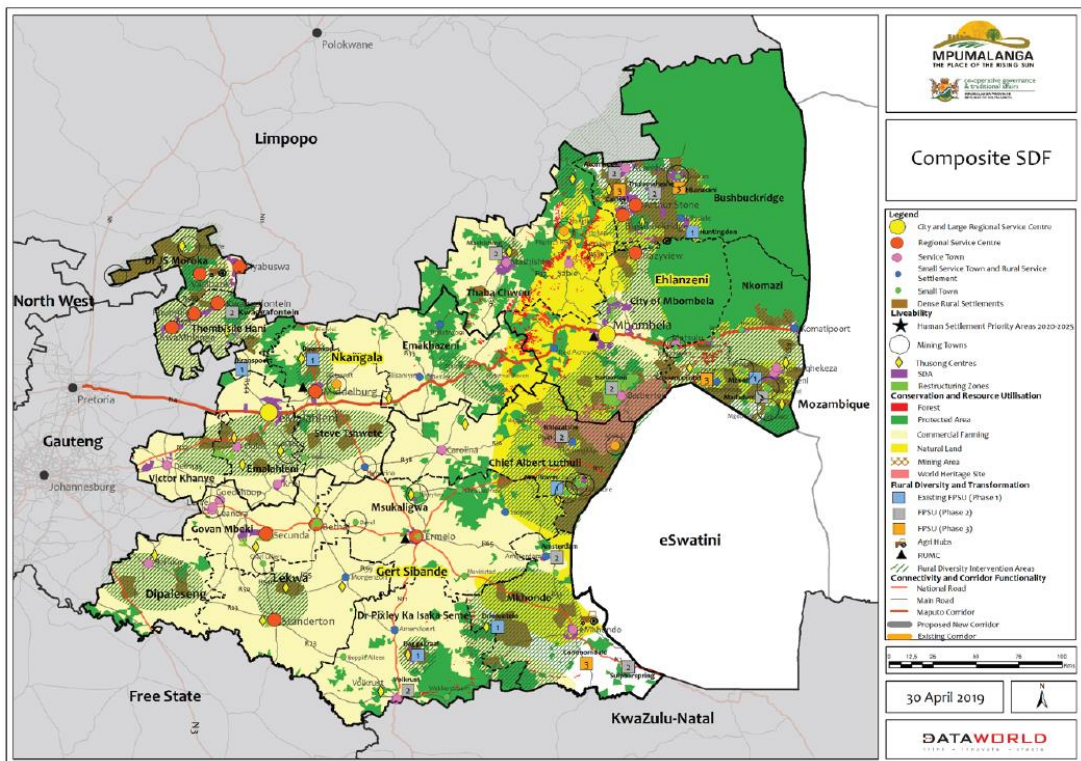
Mining contributes R 49.6 billion (approximately 25%) to the provincial economy. The key mining sector is coal, which represents 83% of South Africa's coal production. The mining sector, specifically coal mining, creates employment opportunities and supports the manufacturing and power generation sector. However, mining is also associated with many issues including water and soil contamination, air pollution and environmental degradation.

Achieving Strategic 6, To optimally utilise the mining potential without compromising the long-term sustainability of the natural environment is closely linked to diversifying and developing a low carbon climate resistant economy. The proposed development supports the objective of diversifying and developing a low carbon, climate resistant economy. In terms of the high-level composite spatial development framework, Ermelo is identified as a Regional Service Centre (red dot) and the development area located to the south east of the town falls within a mining area (brown hatched) (Figure 2.2). The economic sectors in the area include mining and power generation. The dominant land use in the area is commercial agriculture (yellow, Figure 2.3).



Source: Mpumalanga SDF

Figure 2.2: Mpumalanga Composite SDF-Economic Activities



Source: Mpumalanga SDF

Figure 2.3: Mpumalanga Composite SDF-Land Uses

2.3.2 Msukaligwa Integrated Development Plan

The Vision of Msukaligwa Municipality (MM) is to be "A Beacon of Service Excellence". The associated mission to meet the vision is:

- Enhancing community participation to steer development initiatives towards community needs.
- Advocating and stimulating local economy to promote economic growth and development.
- Improving good governance and measurable service delivery techniques.
- Enhancing effectiveness and efficiency in the utilization of available resources.
- Empowering our communities and the vulnerable groups in particular.
- Working in partnership with all its stakeholders.
- Continuously mobilizing resources to achieve high standards in service.

A SWOT analysis undertaken as part of the IDP process identified a number of opportunities and threats that are relevant to the development, namely.

Opportunities

- Power utility, government services, mining, tourism, agriculture, and forestry.
- National corridor developments (N2, N11 and N17).
- Strategic location of the municipality.

Threats

- Ageing infrastructure.
- High unemployment rate.
- Mines that are not rehabilitated.

Based on the outcome of the SWOT analysis a number of key focus areas were identified for attention over the 5-year IDP planning period of which the following are relevant.

- Unemployment and poor economic development.
- Insufficient access to basic services.
- Poor maintenance and upgrading of services infrastructure.
- Poor roads and storm water drainage system.

Besides Ermelo to the north west of the study area, the only other settlement located within relatively close proximity to the site is the rural settlement of Sheepmore, located to the east of the N2 and the study area.

The community engagement process undertaken as part of the IDP process indicated that a number of key issues in the rural areas that are relevant to the development. These include:

Basic services

A number of the rural areas in the MM that do not have access to basic services, including potable water, electricity, and toilets. Some of these challenges can be addressed through the SED initiatives associated with the development.

Skills development and job opportunities

There is a need to support skills development and create employment opportunities. The initiatives listed in the IDP include building of skills development centres or multipurpose centres, employing local contractors on projects implemented within municipality, creating

opportunities for skills transfers by contractors and the provision of bursaries and learnerships. The proposed development will create opportunities for skills development and employment.

Sports and recreation

There is a shortage of sports and recreation facilities and opportunities in many of the rural areas within the MM. The initiatives identified in the IDP to address this include the refurbishment of existing sports facilities, including the provision of ablution facilities, the construction of new sport facilities in remote areas and upgrading of security to prevent vandalism. Some of these challenges can be addressed through the SED initiatives associated with the development.

Section E of the IDP lists the developmental goals, objectives, strategies, and performance indicators. The strategic goals that are relevant to the development include:

- Sustainable and reliable delivery of basic services.
- Reduced unemployment and poverty.
- Social cohesion and spatial transformation.

The key priorities in terms of basic services with specific reference to rural areas includes the establishment of new and or up-grading of existing clinics, and the provision of mobile clinic services for more remote rural areas. The need for clinics outside Ermelo to operate 24 hours and seven days a week due to the absence of hospitals nearby was also raised as a key issue. reach the areas.

In terms of community facilities, the needs identified included, community halls and more Thusong Centres. Centres also need to be established for disabled members of the community.

The key priority in terms of unemployment and poverty is to support economic development and create employment opportunities.

The strategic objectives that are relevant to the development include:

- To provide sustainable and reliable services to communities.
- To coordinate efforts to address unemployment and poverty.

2.2.3 Msukaligwa Municipality Spatial Development Framework

The spatial vision for the MM is *"a diversified, vibrant rural economy that make optimal use of natural resources, supported by a well-connected network of sustainable rural service and economic nodes, where people have access to services and economic opportunity"*.

The SDF is informed by a number of spatial objectives, namely:

- Provide a spatial structure that facilitates access to services for all communities.
- Protect strategic water sources and sensitive eco-systems.
- Provide space for the diversification of the local economy.
- Eliminate past spatial settlement patterns.

The provision of space of the diversification of the local economy is of specific relevance to the proposed development.

A SWOT analysis was undertaken as part of the preparation of the SDF. The key outcomes of the analysis are summarised below.

Strengths

- Rich natural resource base – minerals, high potential agricultural land, water resources, natural environment (lakes region).

Weakness

- Typical rural population distribution making it difficult to reach people with services.
- Remaining service backlogs (water, sanitation, refuse removal).
- Increasing poverty levels.
- Relatively low skills levels; declining functional literacy.

Opportunities

- National projects to enhance regional links may strengthen the locational advantage of Ermelo / Wesselson.
- Potential for tourism linked to natural assets.
- Potential for larger scale beneficiation supported by current nodal structure and transport links.
- Legislative investment by mines (social and labour plans) and the associated opportunity for service provision and socio-economic development³.

Threats

- Declining coal reserves threatens mining economy and employment. Impact on mining sector also impacts on other related industries, such as manufacturing and transport.
- Global and national move away from carbon-based economy will lead to decline in mining, coal power generation economy and employment. This will also impact on mining related industries.
- Competing land uses – mining, agriculture, urban expansion, conservation
- Climate change – decreased rainfall and increased temperatures will have impact on agriculture, forestry, and settlements.
- Population growth exceeding expected and current economic growth.

The results of the SWOT analysis informed the identification of a set of priority issues centred around natural resource management and human development. The issues that are relevant to the proposed development include:

Strategic water source areas

Msukaligwa is part of a catchment area which is classified as strategic water source area at a national scale. The preservation and sustainable use of these water sources is becoming increasingly important in view of climate change. Decisions about the future development of the area should take cognisance of this issue, and not sacrifice long term water security in favour of meeting short term economic or development targets.

Conflicting land uses

Msukaligwa is richly endowed with natural resources including water, high potential land, minerals, and sensitive ecosystems that occur in attractive natural landscapes. However, these natural resources and the demand to exploit them spatially overlap and often conflict. The SDF highlights the need to address and manage potential land use conflicts.

³ Opportunities associated with SLPs would also apply to Community Trusts associated with renewable energy projects.

Reliance on Carbon Economy

The area's economy is currently strongly dependent on coal mining. In addition to coal mining, the area also hosts the Camden Power Station. The SDF notes that the eventual decline of the mining sector and coal-based power generation, based on declining coal deposits and a move away from a carbon-based economy, is a long-term certainty for the area. Emphasis in spatial planning should be on the creation of opportunities to diversify the economy to lessen the impact of the decline.

The SDF highlights the risks posed by climate change, specifically given that large section of the economy is reliant on agriculture and forestry. The area is also the source area of some of the main strategic waterways of the country.

The SDF identifies a number of structuring elements that inform the spatial concept for the MM. These include urban development nodes, transportation corridors, mining areas and commercial agriculture and conservation areas.

The main town of Ermelo is designated as a Primary Node. The function of a Primary Node is to:

- Provide higher order services to the growing urban population, as well as the rural catchment area surrounding the node.
- Provide space for economic diversification and higher intensity economic development, with a focus on agriculture and related activities, mining, utilities, and **power generation**, as well as transport and logistics. Support should also be provided too industrial and commercial uses, as well as business incubation centres and innovation centres, training facilities and educational institutes

Sheepmore, located to the east of the development area, is designated as Rural Node and has been identified as a site for the establishment of a Farmer Production Support Unit in terms of the Department of Rural Development and Land Reform's Agri-Park Programme. The economic focus on Sheepmoor is on forestry and agriculture (livestock, grains (maize and beans) and vegetables). Economic initiatives such as the establishment of grain silo, training in tree farming and provision of connecting infrastructure should be prioritised. The development of small agri-villages in consultation with Mondi/ Sappi is also identified as an initiative. The Socio-Economic Development (SED) spend linked to the proposed development could support for these initiatives

The N2 and N17 are identified as Primary Transportation Corridors, while the N11 is identified as a Secondary Corridor. The SDF notes that development of nodes along these corridors are proposed, in order to intensify development at specific points and achieve economies of scale.

The SDF highlights the key role and spatial extent of mining in the MM, including reference to the Camden coal-fired power station south of Ermelo. Over the longer term the rehabilitation of mining areas and a range of alternative peri-urban uses should be considered for the impacted areas in view of the decrease reliance on coal. Commercial Agriculture also represents a key economic activity in the MM. However, the SDF notes that climate change will pose a risk to the agricultural sector.

The structuring elements have been used to identify spatial focus areas. The areas of relevance to the development include:

- Agriculture and Forestry Focus Areas.

- Conservation and Tourism Focus Area.
- Mining and Peri-Urban Focus Areas.

Agriculture and Forestry Focus Areas

In terms of agricultural development, the SDF notes that the recommendations of the District Rural Development Plan for Gert Sibande District Municipality be implemented. The Plan identifies a number of rural intervention areas (RIAs). As indicated in Figure 2.4, the study area is not located in an RIA. The main land use is commercial farming.

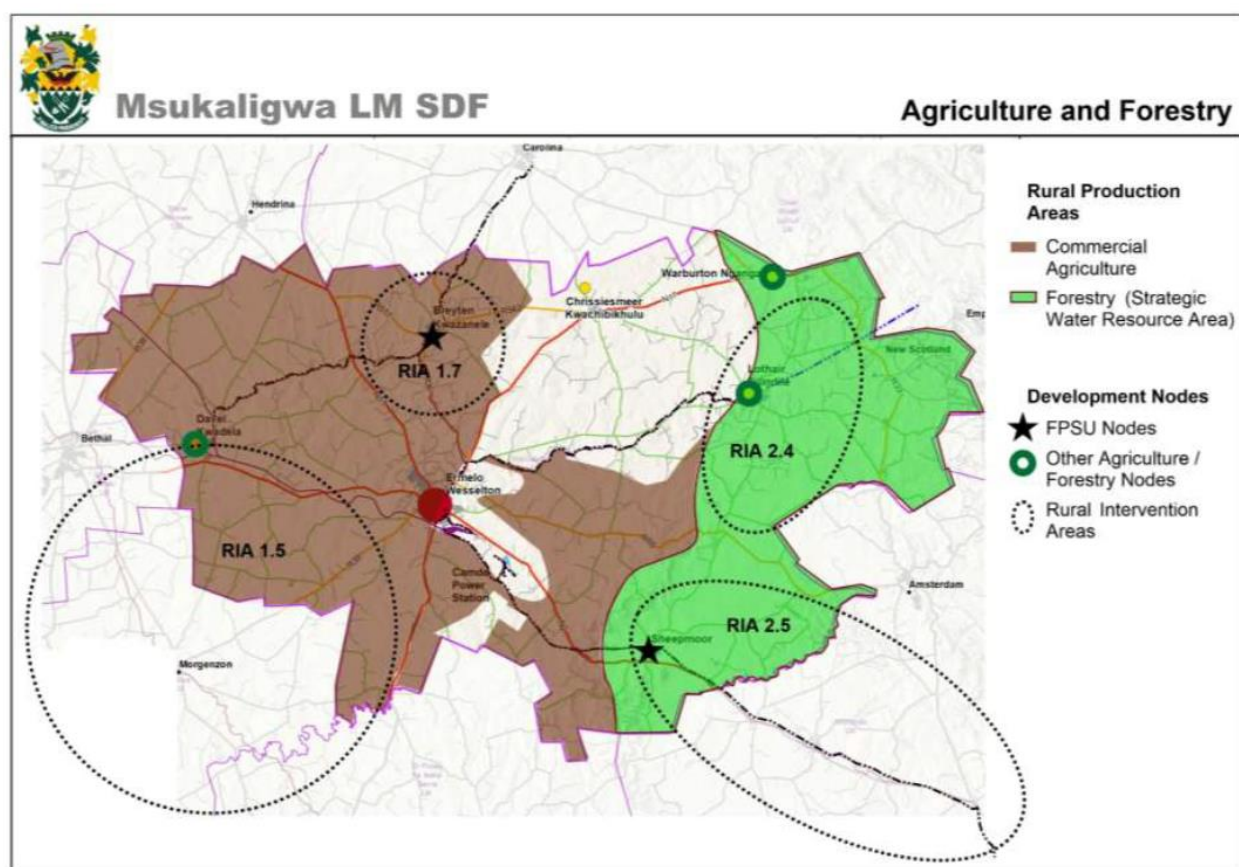


Figure 2.4: Msukaligwa SDF-Agriculture and Forestry

Conservation and Tourism Focus Areas

The SDF notes that the entire Msukaligwa area is environmentally sensitive, and all human activity should be conducted in such a way as to minimise impact. The key areas of significance identified include:

- The lakes region – this natural asset is not only an economic asset for tourism, but also an important ecosystem and an important mechanism to mitigate the impacts of climate change.
- Strategic water source areas and river headwaters – the area makes an important contribution to national water security, and also requires clean water for human development and economic activities such as agriculture.
- Protected areas – a number of small, protected areas exist outside the lake's region. These areas are not only important ecologically, but also from a tourism perspective.

As indicated in Figure 2.5, the majority of the proposed development area is not located in a protected and or tourism area. There is however a protected area to the south of the development area. This will need to be assessed as part of the relevant specialist studies.



The SDF acknowledges the importance of the mining sector and notes that it will need to be accommodated over the short to medium term. However, of relevance to the proposed development the SDF refers to green industries and indicates that the existing site of the Camden Power Station and surrounds should be made available for new industrial development in the long term, to manage the long-term impact of the Power Station being decommissioned. The existing road and rail infrastructure render the area in the vicinity of the Power Station and the site itself highly accessible creating an opportunity for redevelopment with alternative uses requiring extensive space and good connectivity. The SDF also notes that the mining belt area holds other potential that should be harnessed with a long-term view of diversifying the local economy to soften the long-term impact of eventual decline in mining. As indicated in Figure 2.6, the development area is located in an area where current mining activities take place (brown areas). The composite spatial development framework for the MM is informed by the various structuring elements. The

spatial layout is reflected in Figure 2.7. As indicated in Figure 2.7, the majority of the development area falls within a commercial agriculture area. There is also a protected area located to the south of the development area.

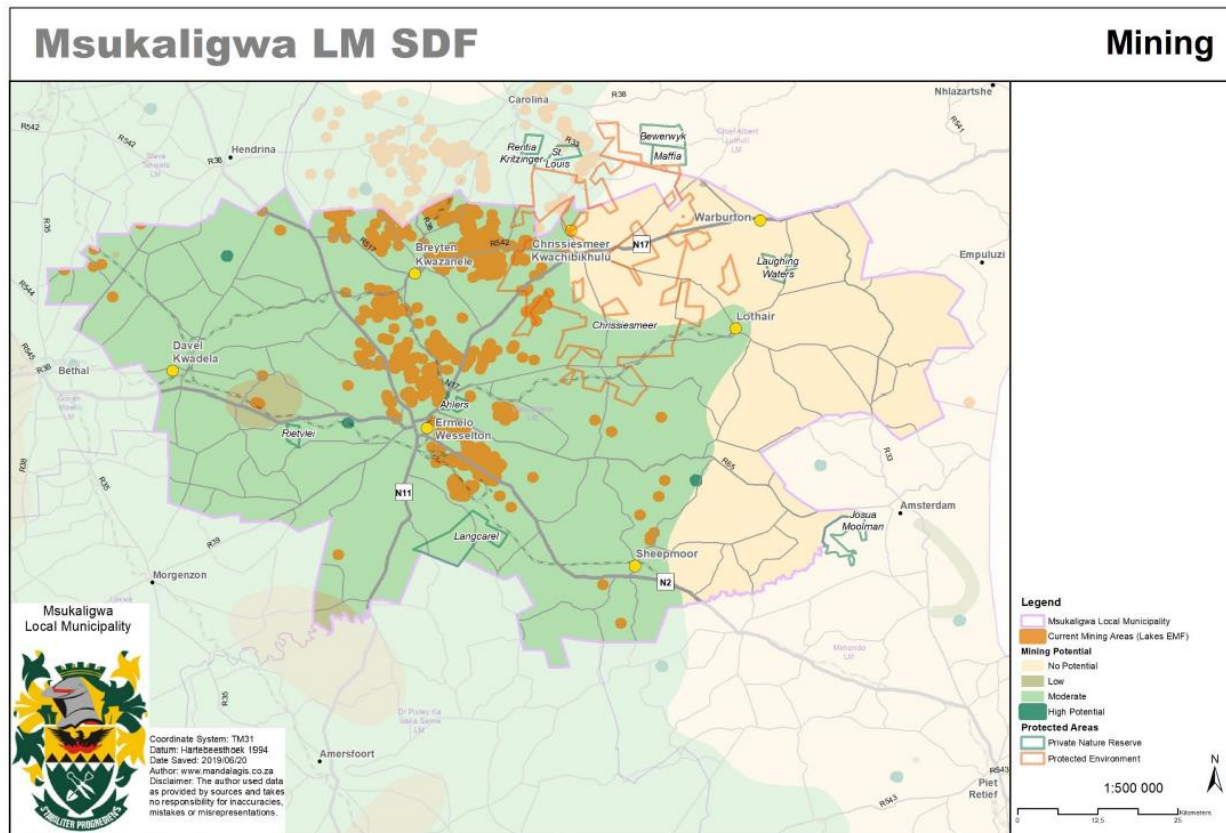


Figure 2.6: Msukaligwa SDF-Mining

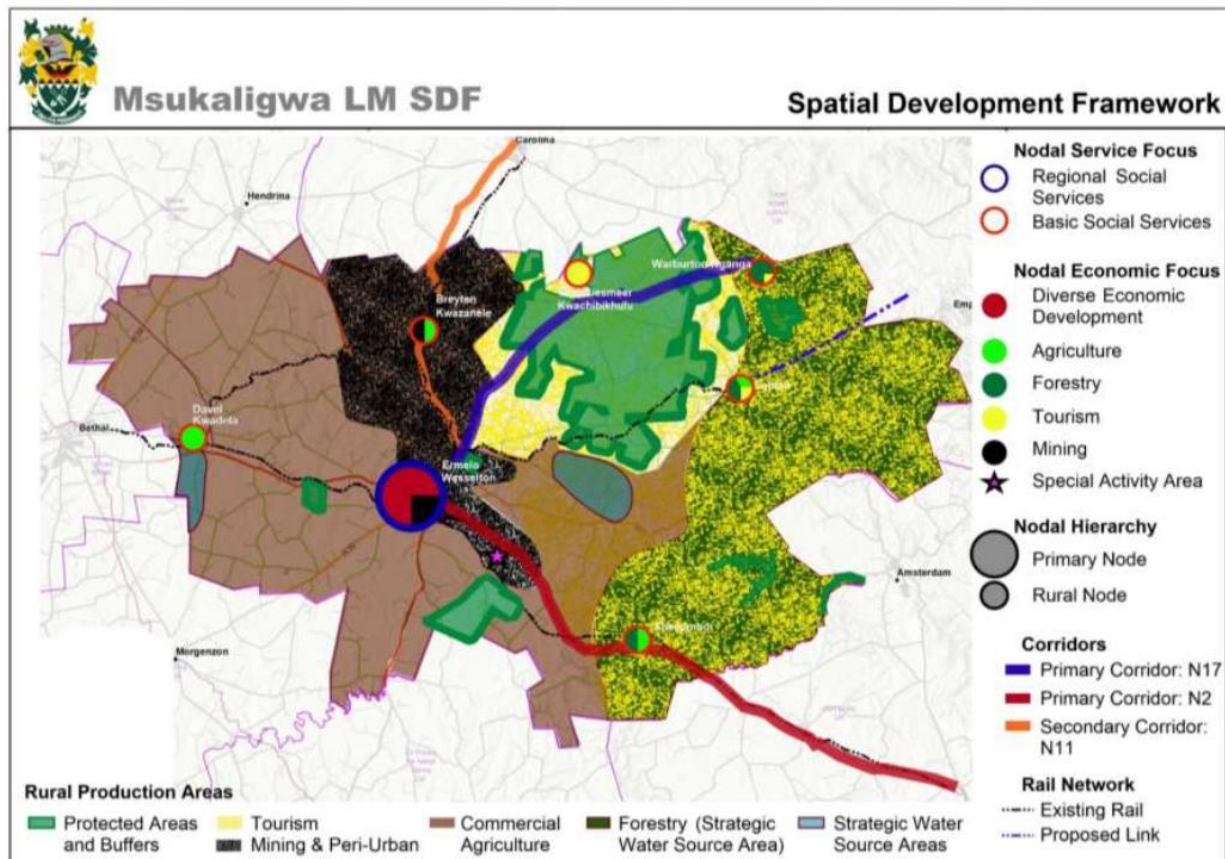


Figure 2.7: Msukaligwa SDF-Composite Spatial Development Framework

2.3 OVERVIEW RENEWABLE ENERGY SECTOR IN SOUTH AFRICA

The section below provides an overview of the potential benefits associated with the renewable energy sector in South Africa. Given that South Africa supports the development of renewable energy at national level, the intention is not to provide a critical review of renewable energy. The focus is therefore on the contribution of renewable energy, specifically in terms of supporting economic development.

The following documents were reviewed:

- Independent Power Producers Procurement Programme (IPPPP): An Overview (June 2020), Department of Energy, National Treasury and DBSA.
- Green Jobs Study (2011), IDC, DBSA Ltd and TIPS.
- Powering the Future: Renewable Energy Roll-out in South Africa (2013), Greenpeace South Africa.
- WWF SA, Renewable Energy Vision 2030, South Africa, 2014.
- Jacqueline M. Borel-Saladin, Ivan N. Turok, (2013). The impact of the green economy on jobs in South Africa), South African Journal of Science, *Volume 109 /Number 9/10, September/October 2013*.
- 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.

2.4.1 Independent Power Producers Procurement Programme (IPPPP): An Overview

The document presents an overview of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) undertaken by the Department of Energy, National Treasury, and the Development Bank of South Africa in June 2020. The programme's primary mandate is to secure electrical energy from the private sector for renewable and non-renewable energy sources. With regard to renewables, the programme is designed to reduce the country's reliance on fossil fuels, stimulate an indigenous renewable energy industry and contribute to socio-economic development and environmentally sustainable growth. The IPPPP 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.

Energy supply

By the end of June 2020, the REIPPPP had made the following significant impacts.

- 6 422MW of electricity had been procured from 112 RE Independent Power Producers (IPPs) in seven bid rounds.
- 4 276 MW of electricity generation capacity from 68 IPP projects has been connected to the national grid.
- 49 461GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational in November 2013.

Renewable energy IPPs have proved to be very reliable. Of the 68 projects that have reached COD, 64 projects have been operational for longer than a year. The energy generated over the past 12-month period for these 64 projects is 11 079GWh, which is 93% of their annual energy contribution projections (P50) of 11 882GWh over a 12-month delivery period. Twenty-eight (24) of the 64 projects (38%) have individually exceeded their P50 projections.

Energy costs

In line with international experience, the price of renewable energy is increasingly cost competitive when compared with conventional power sources. The REIPPPP has effectively captured this global downward trend with prices decreasing in every bid window. Energy procured by the REIPPPP is progressively more cost effective and has approached a point where the wholesale pricing for new coal-and renewable-generated energy intersect.

Through the competitive bidding process, the IPPPP effectively leveraged rapid, global technology developments and price trends, buying clean energy at lower and lower rates with every bid cycle, resulting in SA getting the benefit of renewable energy at some of the lowest tariffs in the world. The price for wind power has dropped by 50% to R0.91/kWh, with the BW4 price directly comparable with the per kWh price of new coal generation. Solar PV has dropped most significantly with a price decrease of 75% to R1.10/kWh between BW1 and BW4. This compares with the industry estimates in April 2020 of R1.45/kWh for Medupi. Considering the on-going delays incompletion, indications are that these costs may even be significantly higher.

Investment

The document notes that the REIPPPP has attracted significant investment in the development of the REIPPs into the country. The total investment (total project costs⁴), including interest during construction, of projects under construction and projects in the process of closure is R209.7 billion (this includes total debt and equity of R209.2 billion, as well as early revenue and VAT facility of R0.5 billion).

The REIPPPP has attracted R41.8 billion in foreign investment and financing in the seven bid windows (BW1 – BW4, 1S2 and 2S2). This is almost double the inward FDI attracted into South Africa during 2015 (R22.6 billion). The document notes that the share of foreign investment and equity showed an increase in the most recent bid window (2S2), suggesting that the REIPPPP continued to generate investor confidence despite the poor economic conditions in South Africa in recent years.

South African citizen shareholding

The importance of retaining local shareholding in IPPs is key condition of the procurement requirements. The RFP notes that bidders are required to have South African Equity Participation of 40% in order to be evaluated. In terms of local equity shareholding, 52% (R31.5 billion) of the total equity shareholding (R61.0 billion) was held by South African's across BW1 to BW4, 1S2 and 2S2. This equates to substantially more than the 40% requirement. Foreign equity amounts to R29.5 billion and contributes 48% of total equity.

The REIPPPP also contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. In this regard, Black South Africans own, on average, 33% of projects that have reached financial close (BW1-BW4), which is 3% higher than the 30% target. This includes black people in local communities that have ownership in the IPP projects that operate in or near their communities and represents the majority share of total South African Entity Participation.

On average, black local communities own 9% of projects that have reached financial close. This is well above the 5% target. In addition, an average of 21% shareholding by black people in engineering, procurement, and construction (EPC) contractors has been attained for projects that have reached financial closure. This is higher than 20% target. The shareholding by black people in operating companies of IPPs has averaged 24% (against the targeted 20%) for the 68 projects in operation (i.e. in BW1–4). The target for shareholding by black people in top management has been set at 40%, with an average 67% achieved to date. The target has therefore been significantly exceeded.

Community shareholding and community trusts

The regulations require a minimum ownership of 2.5% by local communities in IPP projects as a procurement condition. This is to ensure that a substantial portion of the investments has been structured and secured as local community equity. An individual community's dividends earned will depend on the terms of each transaction corresponding with the relevant equity share. To date all shareholding for local communities have been structured through the establishment of community trusts. For projects in BW1 to BW4, 1S2 and 2S2, qualifying communities will receive R26.9 billion net income over the life of the projects (20 years). The report notes that the bulk of the money will however only start flowing into the communities from 2028 due to repayment obligations in the preceding years (repayment obligations are mostly to development funding institutions). However, despite the delay this represents a significant injection of capital into mainly rural areas of South Africa. If the net

⁴ Total project costs means the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation, and or commissioning of the project)

projected income for the first seven bid windows (BW1-BW4, 1S2 and 2S2) was structured as equal payments overtime, it would represent an annual net income of R1.34 billion per year. Income to all shareholders only commences with operation of the facility. Revenue generated to date by the 68 operational IPPs amounts to R105 billion.

Procurement spend

In addition to the financial investments into the economy and favourable equity structures aimed at supporting BEE, the REIPPPP also targets broader economic and socio-economic investment. This is through procurement spend and local content.

The total projected procurement spend for BW1 to BW4, 1S2 and 2S2 during the construction phase was R73.1 billion, while the projected operations procurement spend over the 20 years operational life is estimated at 76.8 billion. The combined (construction and operations) procurement value is projected as R149.9 billion of which R81 billion has been spent to date. For construction, of the R70.2 billion already spent to date, R57.7 billion is from the 68 projects which have already been completed. These 68 projects had planned to spend R52.9 billion. The actual procurement construction costs have therefore exceeded the planned costs by 9% for completed projects.

Preferential procurement

The share of procurement that is sourced from Broad Based Black Economic Empowered (BBBEE) suppliers, Qualifying Small Enterprises (QSE), Exempted Micro Enterprises (EME) and women owned vendors are tracked against commitments and targeted percentages. The IA target requirement for BBBEE is 60% of total procurement spend. However, the actual share of procurement spend by IPPs from BBBEE suppliers for construction and operations combined is currently reported as 83%, which is significantly higher than the target of 60%, but also the 71% that had been committed by IPPs. BBBEE, as a share of procurement spend for projects in construction, is also reported as 84% with operations slightly lower at 74%. However, these figures have not been verified and the report notes that they are reported with caution.

The majority of the procurement spend to date has been for construction purposes. Of the R70.2 billion spent on procurement during construction, R59 billion has reportedly been procured from BBBEE suppliers, achieving 87% of total procured. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion, 81% more than the 14.1 billion planned by the IPPs. The R59 billion spent on BBBEE during construction is 15% more than the R51.1 billion that had originally been anticipated by all IPPs procured.

Total procurement spend by IPPs from QSE and EMEs has amounted to R24.7 billion (construction and operations) to date, which exceeds commitments by 96% and is 30% of total procurement spend to date (while the required target is 10%). QSE and EME's procurement spend for construction was R 22 billion, which is 4.4 times the targeted spend for construction of R4.9 billion during this procurement phase.

In terms of procurement from women-owned vendors to date, 5% of total construction procurement spend has been from woman-owned vendors (against a targeted 5%), and 6% of operational procurement spend has been realised from woman-owned vendors to date, thereby exceeding the targeted 5%. In terms of construction spend, R 3.2 billion was undertaken by women-owned vendors, which is almost double the R 1.9 billion estimated for the construction of projects that have reached financial close.

The REIPPPP has therefore created significant employment opportunities for black South African citizens and local communities beyond planned targets. This highlights the

importance of the programme in terms of employment equity and the creation of more equal societies.

Local Content⁵

The report notes that the REIPPP programme represents the country's most comprehensive strategy to date in achieving the transition to a greener economy. Local content minimum thresholds and targets were set higher for each subsequent bid window. The report notes that for a programme of this magnitude, with construction procurement spend alone estimated at R73.1 billion, the result is a substantial stimulus for establishing local manufacturing capacity. The local content strategy has created the required incentives for a number of international technology and component manufactures to establish local manufacturing facilities.

The documents notes that for the portfolio as a whole, the expectation would reasonably be for local content spend to fall between 25% and 65% of the total project value (considering the range of targets and minimum requirements). Local content commitments by IPPs amount to R67.6 billion or 45% of total project value (R151.1 billion for all bid windows).

Actual local content spend reported for IPPs that have started construction amounts to R57.6 billion against a corresponding project value (as realised to date) of R114 billion. This means that 50% of the project value has been locally procured, exceeding the 45% commitment from IPPs and the thresholds for BW1 – BW4 (25-45%).

To date, the R57.6 billion local content spend reported by active IPPs is already 87% of the R66 billion local content expected. This is with 23 projects still in construction, and 68 of the 91 active projects having reached COD (i.e. 75% of the active portfolio complete). For the 68 projects that have reached COD, local content spend has been R 46.96 billion of a committed R46.55 billion, which is 0.9 more than the planned local spend.

Leveraging employment opportunities

To date, a total of 52 603 job years⁶ have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. These job years should rise further past the planned target as more projects enter the construction phase. Employment opportunities across all five active bid windows are 126% of the planned number during the construction phase (i.e. 33 707 job years), with 23 projects still in construction and employing people. The number of employment opportunities is therefore likely to continue to grow beyond the original expectations. By the end of June 2020, 68 projects had successfully completed construction and moved into operation. These projects created 33 449 job years of employment, compared to the anticipated 23 619. This was 42% more than planned.

The report notes that employment thresholds and targets were consistently exceeded across the entire portfolio. The average share of South African citizens of total South Africa based employees for BW1 – BW4 was 91% during construction (against a target of 80%), while it was 91% during operations for BW1 – BW4 (against a target of 80%). The report notes that the construction phase offers a high number of opportunities over shorter durations, while the operations phase requires fewer people, but over an extended operating period.

⁵ Local content is expressed as a % of the total project value and not procurement or total project costs.

⁶ The equivalent of a full-time employment opportunity for one person for one year

To date, 42 355 job years for SA citizens were achieved during construction, which is 26% above the planned 33 707 job years for active projects. These job years are expected to rise further since 23BW4 projects are still in or entering, construction.

In terms of benefits for local communities, significantly more people from local communities were employed during construction than was initially planned. For active projects, the expectation for local community participation was 13 284 job years. To date 22 935 job years have been realised (i.e. 73% more than initially planned), with 23 projects still in, or entering, construction. The number of black SA citizens employed during construction also exceeded the planned numbers by 53%.

Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 81%, 43% and 49% of total job opportunities created by IPPs to date. However, woman and disabled people could still be significantly empowered as they represent a mere 10% and 0.4% of total jobs created to date, respectively. Nonetheless, the fact that the REIPPPP has raised employment opportunities for black South African citizens and local communities beyond planned targets, indicates the importance of the programme to employment equity and the drive towards more equal societies.

The share of black citizens employed during construction (81%) and the early stages of operations (84%) has significantly exceeded the 50% target and the 30% minimum threshold. Likewise, the share of skilled black citizens (as a percentage of skilled employees) for both construction (69%) and operations (80%) has also exceeded the 30% target and minimum threshold of 18%. The share of local community members as a share of SA-based employees was 49% and 68% for construction and operations respectively – exceeding the minimum threshold of 12% and the target of 20%.

Socio-economic development (SED) contributions

An important focus of the REIPPPP is to ensure that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. In this regard, IPPs are required to contribute a percentage of projected revenues accrued over the 20-year project operational life toward SED initiatives. These contributions accrue over the 20-year project operation life and are used to invest in housing and infrastructure as well as healthcare, education, and skills development.

The minimum compliance threshold for SED contributions is 1% of the revenue with 1.5% the targeted level over the 20-year project operational life. For the current portfolio of projects, the average commitment level is 2.2%, which is 125% higher than the minimum threshold level. To date (across seven bid windows) a total contribution of R23.1 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.2 billion. Of the total commitment, R18.8 billion is specifically allocated for local communities where the IPPs operate. With every new IPP on the grid, revenues and the respective SED contributions will increase.

As a percentage of revenue, SED obligations become effective only when operations commence, and revenue is generated. Of the 91 IPPs that have reached financial close (BW1–BW41), 68 are operational. The SED contributions associated with these 68 projects has amounted to R 1.2 billion to date.

In terms of ED and SED spend, education, social welfare, and health care initiatives have a SED focus. SED spend on education has been almost double the expenditure on enterprise development. This is despite enterprise development being a stand-alone commitment category in terms of the IA. This is, in part, due to the fact that some early childhood development programmes have also been incorporated in educational programmes. IPPs have supported 1 123 education institutions with a total of R312 million in contributions, from 2015 to the end of June 2020. A total of 1 142 bursaries, amounting to R183.8 million, have been awarded by 55 IPPs from 2015 until the end of June 2020. The largest portion of the bursaries were awarded to African and Coloured students (97%), with women and girls receiving 56% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 61%, followed by the Eastern Cape (18%) and Western Cape (14%). Enterprise development and social welfare are the focus areas that have received the second highest share of the contributions to date.

Enterprise development contributions

The target for IPPs to spend on enterprise development is 0.6% of revenues over the 20-year project operational life. However, for the current portfolio, IPPs have committed an average of 0.63% or 0.03% more than the target. Enterprise development contributions committed for BW1 to BW4, 1S2 and 2S2 amount to R7.2 billion. Assuming an equal distribution of revenue over the 20-year project operational life, enterprise development contributions would be R360 million per annum. Of the total commitment, R5.6 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. Up until the end of June 2020 a total of R 384.2 million had already been made to the local communities located in the vicinity of the 68 operating IPPs. This represents 93% of the total R384.2 million enterprise development contributions made to date.

Contribution to cleaner energy and water savings

As part of the global commitment, South Africa is targeting an emissions trajectory that peaks at 34% below a “business as usual” case in 2020, 42% below in 2025 and from 2035 declines in absolute terms. These commitments are incorporated into the National Development Plan in Outcome 10 and sub-outcome 3. The REIPPPP contributes constructively to economic stability, energy security and environmental sustainability.

The emission reductions for the programme during the preceding 12 months (June 2019–June 2020) is calculated as 11.5 million tonnes CO₂ (MtonCO₂) based on the 1 1313 GWh energy that has been generated and supplied to the grid over this period. This represents 56% of the total projected annual emission reductions (20.5MtonCO₂) achieved with only partial operations. A total of 50.2 Mton CO₂ equivalent reduction has been realised from programme inception to date.

The March 2019 Report also notes that since operation, the IPPs have saved 42.8 million kilolitres of water related to fossil fuel power generation. This saving will have increased with the increase in energy generated by renewable energy since 2019. The REIPPPP therefore contributes significantly towards meeting South Africa’s GHG emission targets and, at the same time, supporting energy security, economic stability and environmental sustainability.

2.4.2 Green Jobs Study

The study notes that South Africa has one of the most carbon-intensive economies in the world, therefore making the greening of the electricity mix a national imperative. Within this context the study notes that the green economy could be an extremely important

trigger and lever for enhancing a country's growth potential and redirecting its development trajectory in the 21st century. The attractiveness of wind and solar technologies is not only supported by local conditions, but also by the relatively mature stage of their technological development.

The aim of the Green Jobs study was to provide information on the net direct job creation anticipated to emerge in the formal economy across a wide range of technologies/activities that may be classified as green or contributing to the greening of the economy. The study looked at the employment potential for a number of green sectors, including power generation, over three consecutive timeframes, namely, the short term (2011 – 12), medium term (2013 – 17) and long term (2018 – 25). The analysis attempts to estimate the employment potential associated with: building, construction and installation activities; operations and maintenance services; as well as the possible localisation spin-offs for the manufacturing sector as the domestic production of equipment, parts and components benefits from preferential local procurement.

It is also worth noting that the study only considered direct jobs in the formal economy. Multiplier effects were not taken into account. As a result, the analysis only captures a portion of the potential employment impact of a greening economy. International studies have indicated that there are considerable backward and forward linkages through various value chains of production, as well as of indirect and induced employment effects. The employment figures can therefore be regarded as conservative.

The analysis reveals the potential of an unfolding green economy to lead to the creation of approximately 98 000 new direct jobs, on average, in the short term, almost 255 000 in the medium term and around 462 000 employment opportunities in the formal economy in the long term. The number of jobs linked to the power generation was estimated to be ~ 12 500 in the short term, 57 500 in the medium term and 130 000 in the long term. Power generation jobs therefore account for 28% of the employment opportunities created in the long term. However, the report notes that the contribution made by a progressively expanding green energy generation segment increases from 14% of the total in the short term, or just over 13 500 jobs, to more than 28% in the long term (166 400) (Table 2.3). The study also found that energy generation is expected to become an increasingly important contributor to green job creation over time, as projects are constructed or commissioned.

Table 2.3: Net direct employment potential estimated for the four broad types of activity and their respective segments in the long term, and an indication of the roll-out over the three timeframes

Broad green economy category		Segment	Technology/product	Total net direct employment potential in the long-term	Net direct manufacturing employment potential in the long-term	Total net direct employment potential (ST, MT, LT)	Net direct manufacturing employment potential (ST, MT, LT)
ENERGY GENERATION	Renewable (non-fuel) electricity	Wind power	Onshore wind power	5 156	2 105	VL, L, M	L, M, H
			Offshore wind power				
		Solar power	Concentrated solar power	3 014	608	N, VL, M	N, VL, M
			Photovoltaic power	13 541	8 463	M, H, H	H, VH, VH
		Marine power	Marine power	197	0	N, N, VL	N, N, N
		Hydro power	Large hydro power	272	111	VL, VL, VL	VL, M, VL
			Micro-/small-hydro power	100	0	VL, VL, VL	N, N, N
	Fuel-based renewable electricity	Waste-to-energy	Landfills	1 178	180	VL, VL, L	VL, VL, L
			Biomass combustion	37 270	154	VL, H, VH	VL, VL, L
			Anaerobic digestion	1 429	591	VL, VL, L	VL, L, M
			Pyrolysis/Gasification	4 348	2 663	VL, L, M	VL, H, H
			Co-generation	10 789	1 050	L, M, H	M, H, H
	Liquid fuel	Bio-fuels	Bio-ethanol	52 729	6 641	M, H, VH	L, H, VH
			Bio-diesel				
ENERGY GENERATION SUB-TOTAL				130 023	22 566		
ENERGY & RESOURCE EFFICIENCY		Green buildings	Insulation, lighting, windows	7 340	838	L, M, M	L, M, M
			Solar water heaters	17 621	1 225	L, H, H	L, M, H
			Rain water harvesting	1 275	181	VL, VL, L	VL, VL, L
		Transportation	Bus Rapid Transport	41 641	350	VH, VH, VH	H, M, L
			Industrial	Energy efficient motors	-566	4	VL, VL, VL
		Mechanical insulation		666	89	VL, VL, VL	VL, VL, VL
ENERGY & RESOURCE EFFICIENCY SUB-TOTAL				67 977	2 686		
EMMISSIONS AND POLLUTION MITIGATION		Pollution control	Air pollution control	900	166	N, VL, VL	N, L, L
			Electrical vehicles	11 428	10 642	VL, L, H	N, H, VH
			Clean stoves	2 783	973	VL, VL, L	VL, L, M
			Acid mine water treatment	361	0	VL, VL, VL	N, N, N
		Carbon Capture and Storage		251	0	N, VL, VL	N, N, N
		Recycling		15 918	9 016	M, H, H	H, VH, VH
EMMISSIONS AND POLLUTION MITIGATION SUB-TOTAL				31 641	20 797		
NATURAL RESOURCE MANAGEMENT		Biodiversity conservation & eco-system restoration		121 553	0	H, VH, VH	N, N, N
		Soil & land management		111 373	0	VH, VH, VH	N, N, N
NATURAL RESOURCE MANAGEMENT SUB-TOTAL				232 926	0		
TOTAL				462 567	46 049		

(Source: Green Jobs Study, 2011)

Notes:

- VH = very high (total employment potential > 20 000 direct jobs; manufacturing employment potential > 3 000 direct jobs);
- H = high (total employment potential > 8 000 but < 20 000; manufacturing employment potential > 1 000 but < 3 000);
- M = medium (total employment potential > 3 000 but < 8 000; manufacturing employment potential > 500 but < 1 000);
- L = low (total employment potential > 1 000 but < 3 000; manufacturing employment potential > 150 but < 500);

- VL = very low (total employment potential > 0 but < 1 000; manufacturing employment potential > 0 but < 150);
- N = negligible/none (total employment potential = 0; manufacturing employment potential = 0).

Of relevance the study also notes that the largest gains are likely to be associated with operations and maintenance (O&M) activities, particularly those involved in the various natural resource management initiatives. In this regard, operations and maintenance employment linked to renewable energy generation plants will also be substantial in the longer term. The employment growth momentum related to building, construction and installation activities peaks in the medium term, largely propelled by mass transportation infrastructure, stabilising thereafter as green building methods become progressively entrenched.

In addition, as projects related to a greening economy are progressively commissioned, the potential for local manufacturing also become increasingly viable. Employment gains in manufacturing are also expected to be relatively more stable than construction activities, since the sector should continue exhibiting growth potential as new and replacement components are produced, as additional markets are penetrated, and as new green technologies are introduced. Manufacturing segments with high employment potential in the long term would include suppliers of components for wind and solar farms. The study does note that a shortage of skills in certain professional fields pertinent to renewable energy generation presents a challenge that must be overcome.

The study also identifies a number of advantages associated with renewable energy with a large 'technical' generation potential. In this regard, renewable energy, such as solar and wind, does not emit carbon dioxide (CO₂) in generating electricity and is associated with exceptionally low lifecycle emissions. The construction period for renewable energy projects are much shorter than those of conventional power stations, while an income stream may, in certain instances, be provided to local communities through employment and land rental. The study also notes that the greenhouse gases (GHG) associated with the construction phase are offset within a short period of time compared with the project's lifespan. Renewable power therefore provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa, renewable energy source is not dependent on water (as compared to the massive water requirements of conventional power stations), has a limited footprint and therefore does not impact on large tracts of land, poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants.

Of relevance, the study also notes that renewable energy projects in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues.

2.4.3 Powering the Future: Renewable Energy Roll-out in South Africa

The study notes that South Africa has higher CO₂ emissions per GDPppp (2002 figures) from energy and cement production than China or the USA (Letete, T et al). Energy accounts for 83% of the total GHG emissions (excluding land use, land use change and forestry) with fuel combustion in the energy industry accounting for 65% of the energy emissions of South Africa (DEA, 2011).

Within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. Acid mine drainage from abandoned mines in

South Africa impacts on water quality and poses the biggest threat to the country's limited water resources. Huge volumes of water are also required to wash coal and cool operating power stations. Eskom uses an estimated 10 000 litres of water per second due to its dependency on coal (Greenpeace, 2012).

The report notes that the concerns relating to whether South Africa can afford renewable energy arise out of the perception that renewable energy (RE) is expensive while fossil and nuclear technologies are cheap. The premise also ignores life cycle costing of the technologies which is favourable to renewable technologies where the sources of fuel are free or cheap.

2.4.4 WWF SA Renewable Energy Vision 2030

In its vision the WWF motivated for a more ambitious plan, suggesting that the IRP should provide for an 11-19% share of electricity capacity by 2030, depending on the country's growth rate over the next fifteen years. The vision is to increase renewable energy at the expense of new coal-fired and nuclear capacity. The report notes that in addition to the obvious environmental benefits of this scenario, it will enable South Africa to add flexibility to energy supply capacity on an on-demand basis.

The report notes that Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) introduced in 2011, has by all accounts been highly successful in quickly and efficiently delivering clean energy to the grid. Increasingly competitive bidding rounds have led to substantial price reductions. In this regard, the study indicates that in three years, wind and solar PV have reached pricing parity with supply from new coal-fired power stations from a levelised cost of electricity (LCOE) perspective.

In bidding window 3 of August 2013, the average tariffs bid for wind and solar PV were R0,66/kWh and R0.88/kWh respectively, well below the recent estimates of R1.05/kWh for supply from the coal-fired Medupi and Kusile power stations (Papapetrou 2014).

The report also notes that the REIPPPP has several contracting rounds for new renewables supply. A robust procurement process, extension of a 20-year sovereign guarantee on the power purchase agreement (PPA) and, especially, ideal solar power conditions, have driven the investment case for RE in South Africa. In this regard, South Africa has been identified as one of the worlds' leading clean energy investment destinations (Figure 2.1).

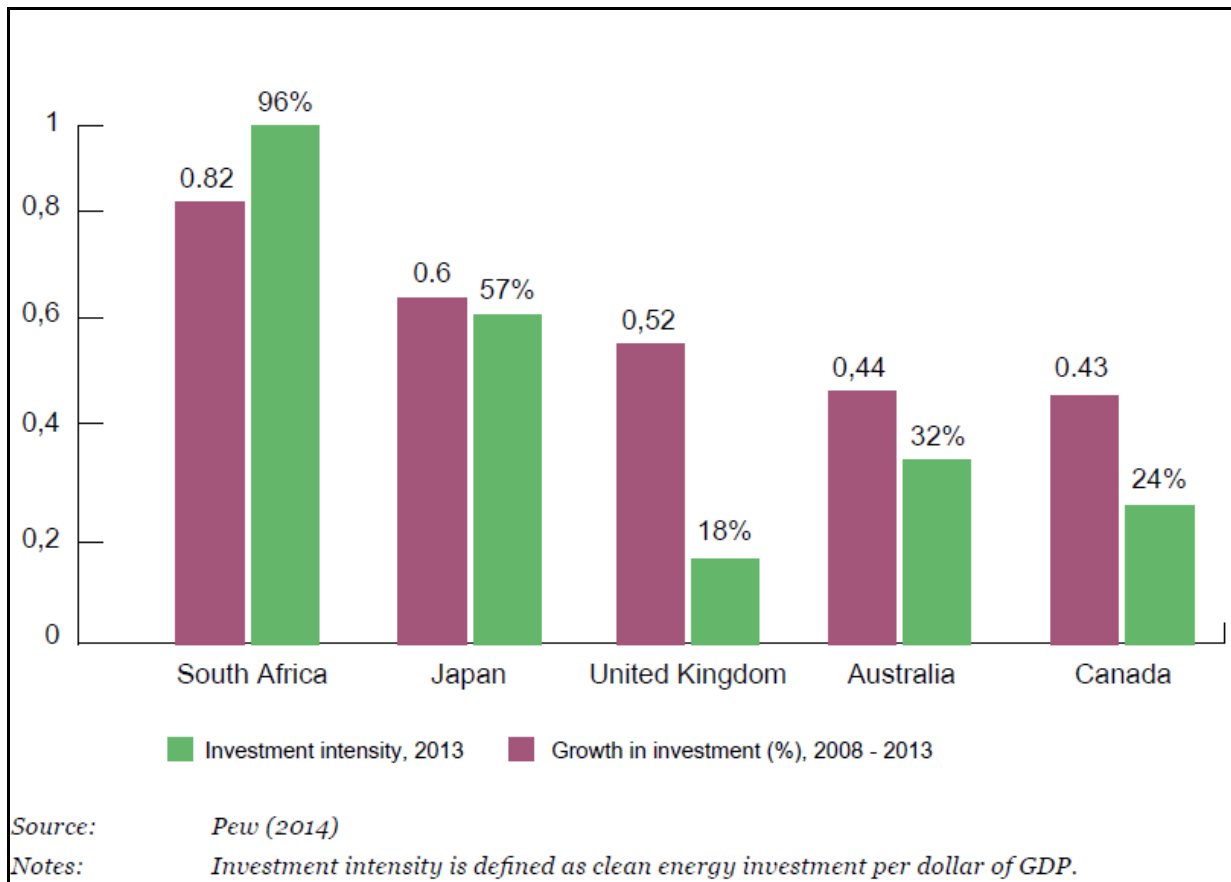


Figure 2.1: South Africa leads as a clean energy investment destination

With regard to local economic development, the REIPPPP sets out various local economic development requirements with stipulated minimum threshold and aspirational targeted levels, which each bidder must comply with. Based on the Broad-Based Black Economic Empowerment Codes, this requirement comprises the following components which make up a scorecard:

- Ownership by black people and local communities.
- Job creation.
- Local content.
- Management control.
- Preferential procurement.
- Enterprise development.
- Socio-economic development.

The final award is based on a combined evaluation in which price determines 70% of the ranking and performance on the local economic development scorecard the remaining 30%. This gives non-price criteria a much heavier weighting than they would normally enjoy under Government's preferential procurement policy.

Job creation, local content and preferential procurement accounted for the bulk of possible points on the scorecard in REIPPPP Round 3. Consequently, a requirement to source goods and services locally is considered to be the central driver of project costs associated with local economic development. In terms of local content, the definition of local content is

quite broad, being the value of sales less the costs associated with imports. However, through successive bidding rounds, the definition has become subject to more detailed definition, with an expanding list of exclusions and increased targeting in terms of key components identified by the Department of Trade and Industry for local manufacturing. This has benefitted local manufacturers and suppliers.

The WWF study considers a low and high growth renewable energy scenario. The capital requirements for the low growth scenario are estimated at R474 billion over the period 2014-2030 (2014 Rand value), rising to R1.084 trillion in the high-growth scenario, in which 35 GW of capacity is built. Each annual round of purchasing 2 200 MW of RE capacity would cost approximately R77 billion in 2014 Rand value terms. In relative economic terms, this equates to 2% of the GDP per annum or approximately one quarter of Government's planned annual investment in infrastructure over the medium term. In the low economic growth scenario, which is arguably the more realistic one, the average annual new liability over the period is approximately R40 billion.

The study also points out that infrastructure spend is more beneficial than other government expenditure due to the infrastructure multiplier effect. This refers to the beneficial impact of infrastructure on economic growth in both the short term, resulting from expansion in aggregate demand, as well as in the longer term (six to eight years) due to enhanced productive capacity in the economy. A recent USA study on highway expenditure revealed the infrastructure multiplier to be a factor of two on average, and greater during economic downturns (Leduc & Wilson 2013). This means that one dollar spent on infrastructure raises GDP by two dollars. If the same were to hold true, as similar analysis suggests it would (Kumo 2012, Ngandu et al 2010), this indicates that the construction of renewable energy plants could be a valuable economic growth driver at a time when fears of recession abound.

The report concludes that the WWF is optimistic that South Africa can achieve a much more promising clean energy future than current plans allow for. With an excellent solar resource and several good wind-producing pockets, the country is an ideal candidate for a renewable energy revolution.

The report indicates that the levelised cost of producing renewable energy already competes favourably with the three main alternatives, namely coal, gas and nuclear. In addition, renewable energy would contribute to a more climate-resilient future and insulate South Africa from dependence on expensive and unreliable fuel sources priced in dollars. Critical from a planning perspective, the report notes that renewable energy can also provide added flexibility on an 'as needed' basis, as electricity demand grows. This is vital in a highly uncertain environment.

2.4.5 The impact of the green economy on jobs in South Africa

The paper notes that greening the economy is particularly important in South Africa for two basic reasons: (1) the exceptional level of unemployment that the country is experiencing and (2) the high carbon impact of the economy.

In terms of employment, the paper refers to the IDC *Green Jobs Report* (2011). In summary, the short-term (next 2 years) estimate of total net employment potential is 98 000 jobs, and the long-term (next 8 years) employment potential is 462 567 jobs. Natural resource management is predicted to lead to the greatest number of these at 232 926 long-term jobs. Green energy generation is estimated to produce 130 023 long-term jobs, with energy and resource efficiency measures adding another 67 977 long-term jobs.

The paper notes that the Green Jobs Report was prepared by seventeen primary researchers from three prominent organisations, namely the IDC, the Development Bank of South Africa, and Trade and Industrial Policy Strategies. Many role players from other organisations were also consulted, including the World Wide Fund for Nature, the Green Building Council, the Economic Development Department and private companies involved in green industries.

Despite questions surrounding the employment estimates contained in the Green Jobs Report, green economic activity does appear to generate more local jobs than fossil-fuel-based industries. Some of the estimates also indicate the potential for significant employment. The paper concludes that the figures represent a promising starting point that warrants further research and policy involvement in greening the economy in South Africa.

2.4.6 The potential for local community benefits

In her thesis, Tait⁷ notes that the distributed nature of renewable energy generation can induce a more geographically dispersed pattern of development. As a result, RE 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. The BBBEE requirements for developers as set out in the DoE's IPPPP for renewables is the primary driver for such schemes. The procurement programme, in keeping with the objective of maximising the economic development potential from this new sector, includes a specific focus on local communities in which wind farms are located.

The procurement programme, typical of all Government tendering processes, includes a BBBEE scorecard on which renewable energy projects are evaluated. However, the renewables scorecard appears to play an important part in a renewed focus on the broad-based Aspects of the legislation, as enforced by a recent national review of the BBBEE Act. In this regard, the renewables scorecard includes specifications for local communities in respect of broad-based ownership schemes, socio-economic development and enterprise development contributions. This approach to legislating social responsibilities of business in all sectors definitely has a South African flavour, borne out of the political history of the country and the imperatives for social transformation laid out in the constitution.

While Tait notes that it is still early days for the development of this sector and one cannot determine the impact that such benefit schemes may have, it is clear though that targeted development expenditure will be directed to multiple rural communities and there seems to be a strong potential to deliver socio-economic benefits.

⁷ 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

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 Msukaligwa Municipality (MM) within the Mpumalanga Province. The MM is one of the seven Local Municipalities that make up the Gert Sibande District Municipality (Figure 3.1). The town of Ermelo is the administrative seat of the MM.

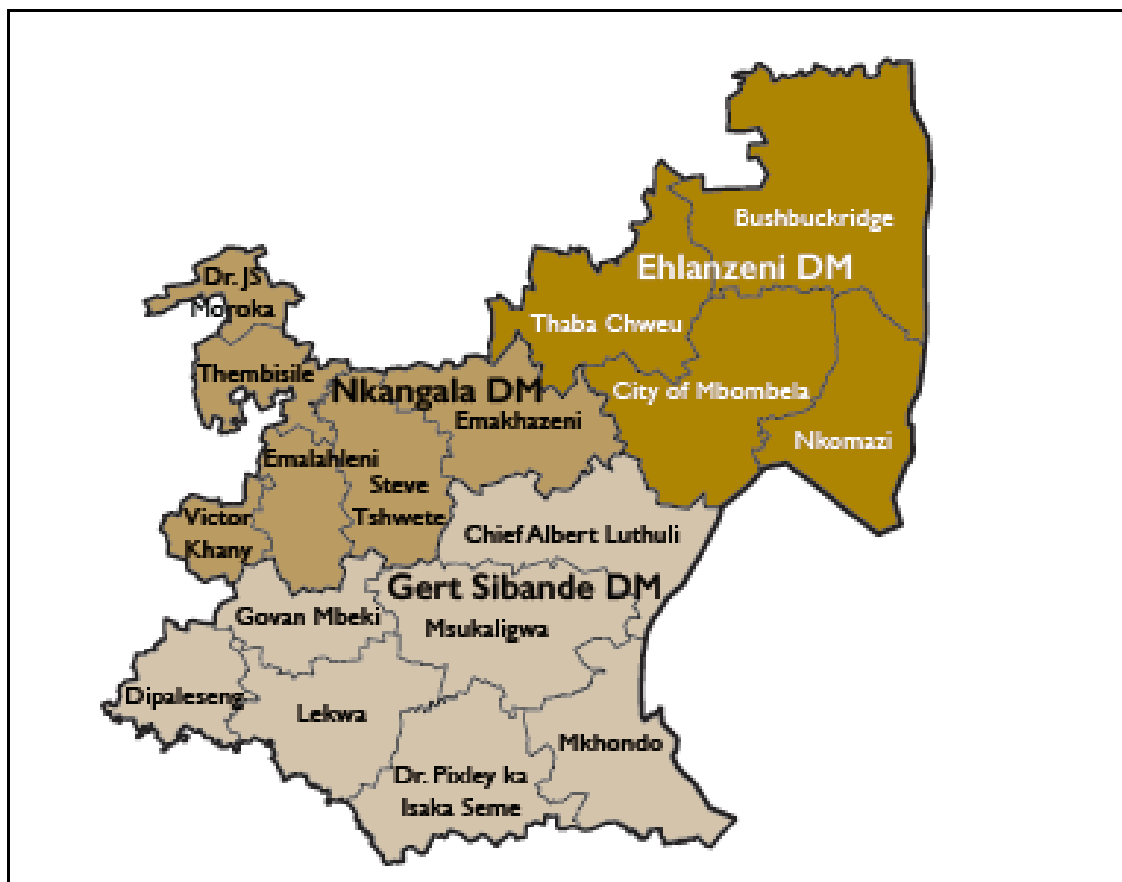


Figure 3.1: Location of Msukaligwa Municipality within the Gert Sibande District Municipality and Mpumalanga Province.

3.3 DEMOGRAPHIC OVERVIEW

Population

The population of the MM in 2016 was 164 608 (Community Household Survey 2016). Of this total, 35.4% were under the age of 18, 60.4% were between 18 and 64, and the remaining 4.1% were 65 and older. The MM therefore had a high percentage of the population that fall within the economically active group of 18-65. The figures are higher than the figures for the GSDM and Mpumalanga (57.7% and 56.6% respectively). This is likely to be due to the employment opportunities associated with the mining and manufacturing activities in the MM.

The dependency ratio is the ratio of non-economically active dependents (usually 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. The traditional approach is based people younger than 15 or older than 64. The information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e., they are likely to be at school).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratios for the MM, the GSDM and Mpumalanga in 2016 were 65.4%, 73.5% and 77% respectively. The high dependency ratios reflect the limited employment and economic opportunities in the area and the province as a whole. As indicated above, a high dependency ratio also places pressure on local authorities in terms of service delivery.

In terms of race groups, Black Africans made up 91.6% of the population on the MM, followed by Whites, 6.9% and Asian or Indians, 0.9%, and Coloureds, 0.6%. This figures for the GSDM are similar. The main first language spoken in the MM was isizulu, 79.1%, followed by Siswati, 7.3% and Afrikaans, 6.2%.

Households and house types

The total number of households in the MM in 2016 was 51 090, which constituted approximately 20% of the total number of households in the GSDM. Of these 66.2% were formal houses, 9.1% flats in backyards, 6.6% traditional dwellings, and 9.4% shacks or informal dwellings. The figures for the GSDM were 67.2%, 4.6%, 6.7% and 13.4% respectively. The majority of dwellings in the MM are therefore formal structures. A relatively large percentage of the properties in the MM (43.3%), while 5.9% were owned and in the process of being paid off. 22.1% of the households rented their properties, while 10.6% occupied their properties rent free. The rent-free figure is likely to be associated with farm workers. The relatively high number of properties that are owned and or in the process of being paid off reflects a relatively stable and established community.

In terms of household heads, approximately 38.9% of the households in the MM and 39.1% of the households in the GSDM were headed by women. These figures similar to the provincial figure of 39.71%. The high percentage of households headed by women reflects 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

Based on the data from the 2011 Census, 12.6% of the population of the MM had no formal income, 4.1% earned less than R 4 800, 7.1% earned between R 5 000 and R 10 000 per annum, 17.7% between R 10 000 and R 20 000 per annum and 20.9% between R 20 000 and 40 000 per annum (2016). 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 62.4% of the households in the MM and 65.2% in the GSDM 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 GSDM that live close to or below the poverty line is likely to have increased over the last 18 months. This, coupled with the high dependency ratio, is a major cause of concern for the area.

Employment

The official unemployment rate in the MM in 2016 was 15.6%, while 42.6% were employed, and 36.4% were regarded as not economically active. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in both the ULM and Ward 3. Recent figures released by Stats South Africa also indicate that South Africa's unemployment rate is in the region of 36%, the highest formal unemployment rate in the world.

Education

In terms of education levels, the percentage of the population over 20 years of age in the MM and GSDM with no schooling was 10.6% (2016), compared to 10.8% and 11.3% for the GSDM and Mpumalanga Cape Province. The percentage of the population over the age of 20 with matric was 34.12%, compared to 34.3% and 36.1% for the GSDM and Mpumalanga. The education levels for the MM are therefore similar to the DM and Provincial figures.

3.4 MUNICIPAL SERVICES

Electricity

Based on 2016 survey, 87% of households in the MM had access to electricity, compared to 90% for the GSDM and 93% for Mpumalanga.

Access to water

Based on the 2016 survey information, 81.7% of households in the MM were supplied by a service provider, while 5.8% relied on their own service or natural sources (4%). The reliance on own services or natural sources reflects the rural nature of large parts the MM.

Sanitation

72.3% of the households in the MM had access to flush toilets (2016), while 18.8% relied on pit toilets and 3.2% had no access to formal sanitation. The high percentage of

households that rely on pit toilets is linked to the relatively high percentage (9.4%) of households that live in shacks.

Refuse collection

Only 59.4% of the households in the MM had access to regular refuse removal service, while 16.5% disposed of their waste at their own dump and 7.1% had not access to facilities. The low percentage of households that have access to regular refuse removal services is linked to the relatively high percentage (9.4%) of households that live in shacks. The relatively higher percentage that dispose of their waste at their own dump reflects the rural nature of the area and the difficulty of providing municipal services to areas located at a distance from the main towns in the area.

3.5 HEALTH, EDUCATION AND COMMUNITY FACILITIES

Health Services

The MM IDP indicates that there is 1 government and 1 private hospital in the MM, 10 primary health care clinics, and 4 mobile clinics (Table 3.1).

Table 3.1: Health services in Msukaligwa Municipality

Facilities	Number
Private Hospitals	1
Primary Health Care Clinics	10
Mobile Clinics	4
Government hospitals	1
Infectious Hospital (TB)	1
Dentists	4
Gynaecologist	1
Social Workers	12
Private Doctors	20

Educational Facilities

The MM IDP indicates that there are 71 primary schools, 6 high schools, 12 combined schools and 11 secondary schools in the MM. There is 1 FET College, but no tertiary facility (Table 3.2). The IDP notes that given the growth in the area there is a need for at least a tertiary institution within the GSDM. Development within Ermelo has also created a need for more primary and high schools.

Table 3.2: Educational Facilities in Msukaligwa Municipality

Facility	Number
No. of Primary Schools	71
No. of High School	6
No. of Combined Schools	12
No. of Secondary Schools	11
No. of Tertiary Education Facilities	0
No. of FET Colleges	1
No. of Training Centres/Adult Education	9
No. of Private Schools	3
Day Care Centres	40

Community Facilities

Table 3.3 lists the community facilities in the MM. As indicated in the table, Ermelo as the administrative centre is relatively well catered for in terms of community facilities, including police stations, sports facilities, libraries, community halls and pension pay out points. However, Sheepmore, which is the closest rural settlement to the development area does not have a library and the sports facility is an informal soccer field.

Table 3.3: Community facilities

Area/Town	Police Station	Public Sport Facilities	Public Libraries	Community Halls	MPCC/TSC	Post Offices	Pension pay points	Comments
Breyten/KwaZanele	1	4	2	2	1	1	1	There is one informal soccer field at Breyten
Ermelo, Wesselton, Cassim Park and Thusville	2	9	4	5	-	1	2	There are five informal soccer field at Wesselton. The Thusville library is completed but not yet operating.
Chrissiesmeer/Kwachibikhulu	1	1	1	1	-	1	1	There is one informal soccer field at Chrissiesmeer
Area/Town	Police Station	Public Sport Facilities	Public Libraries	Community Halls	MPCC/TSC	Post Offices	Pension pay points	Comments
Davel/Kwadela	1	2	1	1	-	1	1	There is one informal soccer field at KwaDela. There is a complaint that the existing library at Davel is far from the majority users who reside at KwaDela.
Lothair/Silindile	1	1	1	1	1	1	1	The TSC is almost completed and postal services run by agency at Lothair
Sheepmoor	1	1	-	1	-	1	1	There is one informal soccer field at Sheepmoor. No library at Sheepmoor
Warburton/Nganga	-	1	-	-	-	1		Postal services run by agency at Warburton. The sport facility is an informal soccer field. No library service at Warburton.
TOTAL	7	19	8	11	2	6		

3.6 ECONOMIC OVERVIEW

The economic growth rate for Msukaligwa was at 3.0% per annum on average over the period 1996 to 2017 and forecasted average annual GDP growth for 2017-2022 relatively low at 1.3%. The contribution of Msukaligwa to the Mpumalanga economy was around 4.3%, making it the fifth largest local economy in the province. It is the second largest

economy in the District, contributing around 15.5%. The key economic sectors in the MM in 2017 in terms of contribution to GDP were mining (20.3%), community services (18.5%), trade (including industries such as tourism) (18.2%) and finance (14.2%) (Table 3.4). Despite the importance of agriculture, it only contributed 6% to GDP in 2017. The IDP notes that the MM has a comparative advantage in economic sectors such as agriculture, transport, and mining.

Table 3.4: Contribution of sectors to Msukaligwa Municipality GDP

Economic Sector	2014	2017	Change
Agriculture	5,3%	6,0%	0,7%
Community Services	18,4%	18,5%	0,1%
Construction	2,7%	2,7%	0,0%
Finance	13,3%	14,2%	0,9%
Manufacturing	5,1%	5,1%	0,0%
Mining	20,8%	20,3%	-0,5%
Trade	18,5%	18,2%	-0,3%
Transport	11,3%	11,3%	0,0%
Utilities	4,5%	3,8%	-0,7%

Finance and Agriculture achieved the highest, although slight, growth in contribution from 2014 to 2017. The contribution of utilities, mining and trade declined slightly.

In terms of employment, the trade sector (20.6%) was the most important sector in terms of employment, followed by community services (15.3%), mining (12.8%), finance (11.6%) and manufacturing (10.1%) (Table 3.5).

Table 3.5: Contribution to employment of sectors in Msukaligwa Municipality

Employment Sector	2014	2017	Change
Agriculture	6%	6,3%	0,3%
Community Services	14,5%	15,3%	0,8%
Construction	7,9%	8,5%	0,6%
Finance	11,2%	11,6%	0,4%
Manufacturing	9,9%	10,1%	0,2%
Mining	14,7%	12,8%	-1,9%
Trade	21,1%	20,6%	-0,5%
Transport	4,5%	4,7%	0,2%
Utilities	2,5%	2,4%	-0,1%

In terms of unemployment, the MM unemployment rate was the 6th lowest among all the municipal areas of Mpumalanga. The unemployment rate deteriorated slightly from 23.1% in 2014 to 24.1% in 2017. Unemployment rates are higher for females at 29.8% and for males at 24.1%. However, youth unemployment at 34.5% is a key concern.

The IDP notes that in terms of future economic development, coal mining can be expected to remain an important sector for the short to medium term. However, the role of this sector is expected to decline in the medium to long term due to limited coal resources, and a move away from a coal-based economy locally and globally due the impact on climate. The current transport and logistics sector is also likely to be impacted on by a decline in coal mining.

3.7 OVERVIEW OF STUDY AREA⁸

3.7.1 Introduction

The study area is located ~ 17 km to the south-east of the town of Ermelo, which is the administrative centre of the MM. Ermelo is the administrative seat of both the Msukaligwa Local Municipality (MLM) and the Gert Sibande District Municipality (GSDM) and is also known as the garden city of Mpumalanga and the gateway to the province. The small settlement of Camden associated with Camden Power station (located 2.3 km north of the project site), is the only other urban area located in significant proximity.

Three national highways, namely the N2, N11 and the N17 intersect at Ermelo. The N2 freeway connects Ermelo with Richards Bay on the KwaZulu Natal coastline. The N11 South connects the town to Newcastle to the south and then onto the Ladysmith before linking up with the N3 to Durban. The N11 north connects to Middelburg and the N4 freeway west to Pretoria. The N17 West connects the town to the southern suburbs of Johannesburg and N17 East to eSwatini.

Ermelo is also a major railway junction between Mpumalanga and KwaZulu-Natal. The rail junction connects to Machadodorp which is on the Pretoria and Maputo railway line. The town also lies on the Richards Bay railway line that connects the Mpumalanga coalfields with the export Port of Richards Bay on the Indian Ocean. The study area is flanked by the N2 to the north and north-east of the site, and the N11 to the west and south west of the site. The Richards Bay railway line traverse the site to the south of the Camden Power station site. The proposed Camden 1 WEF project is located just to the south of the Camden Power station (Figure 3.2).

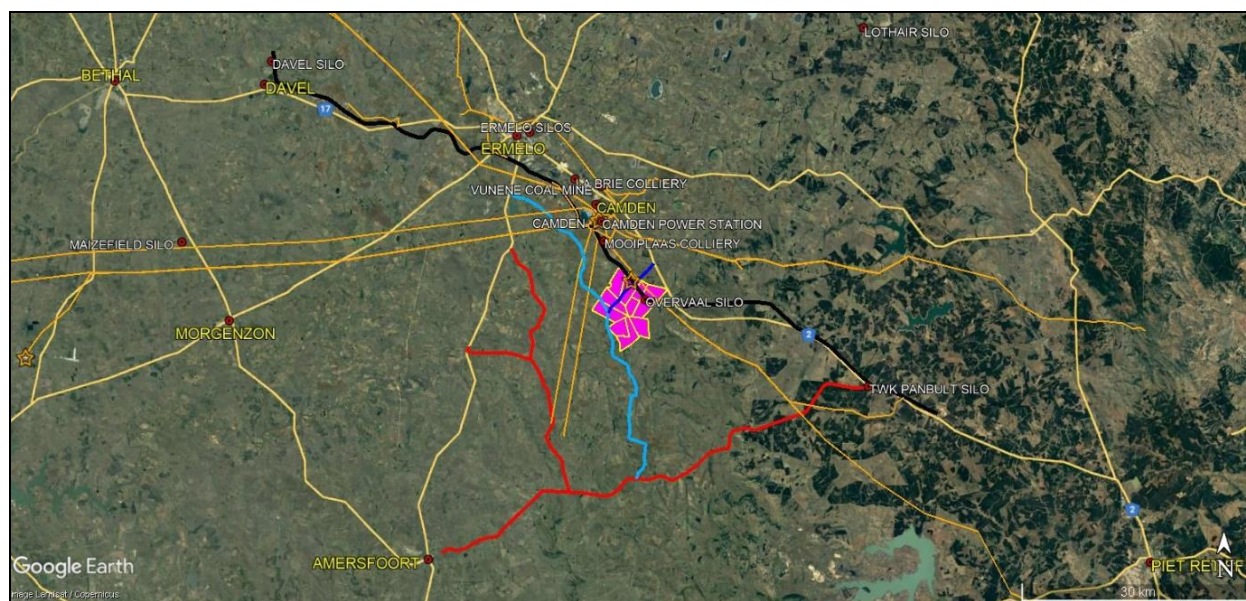


Figure 3.2: Camden II WEF site (pink fill) and subject properties (yellow) indicated in relation to settlements, grain silos and local collieries, Camden power plant, existing Eskom lines (orange lines), railway line (black) and local public gravel roads (red), including the De Emigratie road (light blue) and Overvaal road (dark blue)

⁸ The overview of the study area will be updated following the site visit during the Assessment Phase

The Eskom Camden Coal Power station is located immediately to the north and north east of the site (Photograph 3.1). Construction of the 1600 MW power station commenced in November/December 1962 and the first turbo-generator was commissioned in April 1967. The last of the eight units was commissioned in 1969. The Camden Power station became the starting point of the national power grid, consisting of a series of 400 kV lines which today interconnect the entire country. The power station has six 111.86 m high cooling towers and four 154 chimney (smoke stacks) that served 8 boilers.

Between 1990 and 2006 the station was mothballed, but South Africa's energy crisis in the early 21st century prompted Eskom to recommission the station, starting with unit 6 in July 2005 and completing with unit 1 in July 2008. The development of the Camden Power station also involved the construction of the village of Camden, located ~ 1.3km to the north of the power station. The village, which consists of 356 was established to accommodate administration, operating and maintenance personnel. Community facilities including a community hall, sports facilities, included four tennis courts, a bowling green, swimming bath, shooting range, rugby, hockey, soccer, and cricket fields and jukskei, and the associated clubhouses and changerooms were also established. Several parks, situated throughout the residential property, provided playgrounds for some 500 children at Camden. Schooling was provided in Ermelo for these children, with a regular bus service operating between Camden and Ermelo⁹. The settlement currently accommodates a SANDF military base (Camden).



Photograph 3.1: Camden Power Station

⁹ <https://www.eskom.co.za/sites/heritage/Pages/Camden.aspx>

The study area is primarily accessed off three public gravel roads which intersect with the N11 or N2, viz. the De Emigratie-(N11), Familiehoek-(N11) and Overvaal (N2) roads (Photograph 3.2). The De Emigratie road functions as a north-south-aligned spine that traverses the area and provides two routes between the N11 and the N2 via the study area (Photograph 3.3). The Familiehoek serves a similar function, but along a shorter distance, and further to the west (Photograph 3.4). Base farms are typically accessed directly off these roads, with internal roads providing access to uninhabited farm portions or properties. Access to farm roads is typically unrestricted (i.e., no access gates – but there are exceptions). A road off the Overvaal road (N2-De Emigratie Rd) provides the only access road to the Overvaal silo complex.

Study area properties are primarily accessed off two public gravel roads which intersect with the N11 or N2, viz. the De Emigratie- (N11) and Overvaal (N2) roads. The De Emigratie Road functions as a north-south-aligned spine, ultimately providing two routes between the N11 and the N2 via the study area. The Overvaal Road provides a direct link to the N2 (Photograph 3.2). A road off the Overvaal Road provides the only road access to the Overvaal silo complex and is of key significance during harvesting time (Photograph 3.3). The Overvaal Road intersects with the De Emigratie road within the study area (Photograph 3.4). Base farms are typically accessed directly off these roads, with internal roads providing access to uninhabited farm portions or properties. Access to farm roads is typically unrestricted (i.e., no access gates – but there are exceptions).



Photograph 3.2: Intersection of N2 and Overvaal gravel road



Photograph 3.3: Access road to the Overvaal silo, seen from the intersection with De Emigratie Road



Photograph 3.4: Intersection of Overvaal road (foreground) and De Emigratie road

The study area forms part of the Ermelo commercial farming district. Ermelo is a key producer of field crops and livestock, typically in mixed operations. Field crops are grown under dryland conditions. Key crops include maize and field beans (Photograph 3.5). Six large silo complexes are located within a 40 km of Ermelo, including the silos at the Overvaal rail siding (Photograph 3.6).



Photograph 3.5: Soy bean fields on Uitkomst farm along the De Emigratie Road, with Camden power station in the background.



Photograph 3.6: Overvaal silo located adjacent to Richards Bay railway line

Both beef cattle and sheep are also farmed in the area raised (Photographs 3.7 and 3.8). The natural grassveld grazing resource has a relatively high carrying capacity of around 1 head of cattle (LSU) to 4.5 hectares. Most owners also utilize pastures for hay production. The veld is prone to veldfires, specifically during the dry winter months. Key grazing spp.

such as Oulandsgras (*Eragrostis curvula*) may take up to 3 years to recover to full productivity (van der Meulen, pers. comm).



Photograph 3.7: Working beef cattle on Welgelegen Farm



Photograph 3.8: Sheep grazing on Klipfontein Farm

The settlement pattern is sparse and concentrated along the main public gravel roads. The estimated minimum size of an economically feasible cropping operation is around 1 000 ha and many of the local farmers lease additional land. There is a tendency towards larger operations in order to maintain a viable economy of scale in the face of continuously rising input costs. As a result, many properties are devoid of dwellings, while farmsteads on a few have been abandoned (Photograph 3.9). Base farms are typically inhabited by farm owners and or managers.



Photograph 3.9: Uninhabited farmstead on Adrianople 296/1 (de Jager) adjacent to the De Emigratie Road

Farms typically consist of a patchwork of cropped areas and veld used as rangeland. Essentially all the high potential agricultural land is used crop cultivation. The study area terrain is undulating and largely treeless, but substantial (and distinctive) oak lanes and small groves are located on some study area properties. Relatively small numbers of farm labourer families reside on a few farms, but the general trend is towards transporting in labourers in from Ermelo on a daily or weekly basis. Larger operations may provide permanent employment to up to 40 workers. Most of the opportunities are associated with cropping activities. Small groups of households with historical tenure rights reside in small clusters on a number of farms along the key public gravel roads (Photograph 3.10).



Photograph 3.10: Accommodation for non-tenured workers on Klipfontein along the Familiehoek Road

A number of historic and operational coal mines are located in the immediate vicinity of Camden power station. These include the active Mooiplaas Colliery adjacent to the railway line south of Camden power station, and the large La Brie and Vunene mines to the north of the N2 between Camden and Ermelo. No historic diggings or active mining currently takes place in the study area located to the west (south) of the Richards Bat railway line. However, prospecting has been carried out on a number of farms in the study area in recent years. Fourteen overhead lines (88 kV to 400 kV) currently feed into/ out of Camden substation adjacent to the plant (various approach directions). The study area is currently broadly affected by 3 x line corridors, viz. a single corridor (2 lines) approaching Camden from the east and aligned parallel to the north/ east of the N2; and 2 corridors (1 x 400 kV each) approaching Camden from the south parallel and approximately 1.8 km apart. The 2-line corridor (1 x 400 kV, 1 x 88 kV) loops into/ out of a small substation located on Adrianople 296/3 adjacent to the railway line within the study area. Only the latter corridor directly affects site properties (Photograph 3.11).

Visitor accommodation in Ermelo largely caters for travellers and business people. The town is not regarded as a tourism destination. A few venue-type facilities are located to the south of the town and largely cater for local functions such as weddings.



Photograph 3.11: Power line corridor approaching Camden substation from the east viewed on Adrianople farm (van der Meulen) along the Overvaal Road

3.7.2 Site properties

The Camden II WEF site is located in a rural, farming context. The site properties and area to the west and south form part of the Ermelo commercial farming district. The land located to the east of the van der Meulen properties (i.e., immediately to the east of the site) is communally owned. The Camden II WEF site consists of 10 properties. Turbines are proposed on 9 (Figure 3.3). The substation site alternatives are located on one property each.

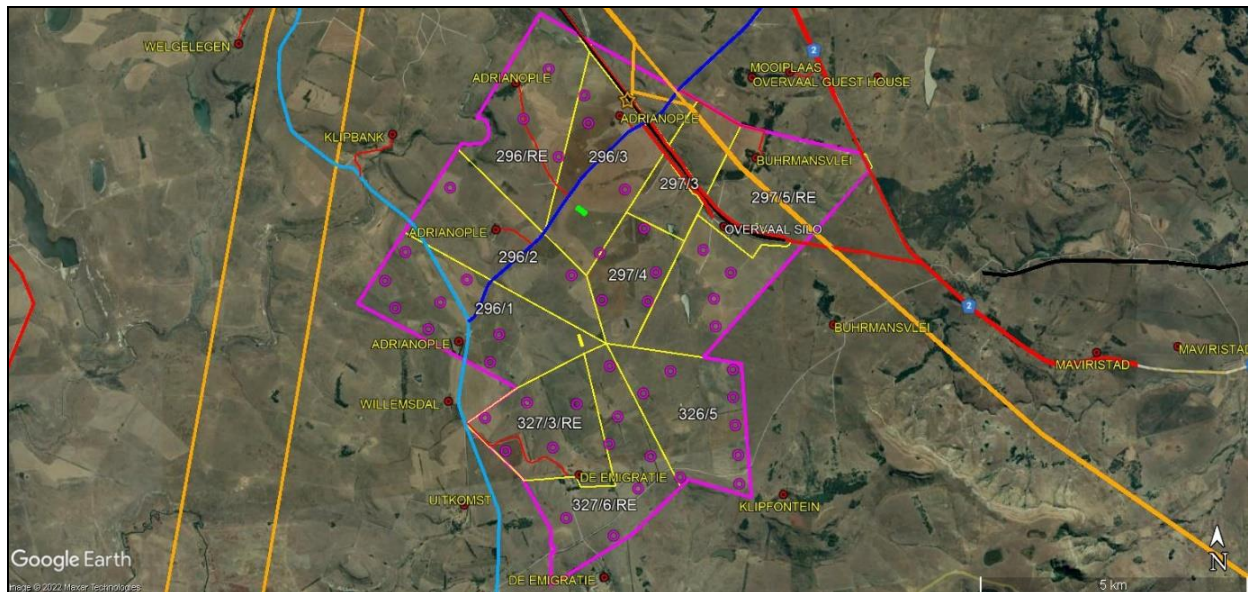


Figure 3.3: Camden II WEF site (pink) and substation Alt 1 (yellow fill) and Alt 2 (green fill) in relation to site- and adjacent properties (yellow outlines). Pink circles indicate proposed turbine locations. Also indicated are existing power lines (orange lines), the KZN railway line (black), and the Overvaal (dark blue) and De Emigratie (light blue) public gravel roads and other roads (red).

The 10 affected properties are owned by five land owners. Mr Johan van der Meulen accounts for 6 of the properties, while Messrs Saaiman, Buhrman, de Jager and Smuts account for one each (Table 3.6). Mr de Jager leases De Emigratie 327/3/RE from Mr

Buhrman, and Mr Smuts leased his land to Mr Krige. Four larger farming operations are therefore directly affected, viz. of Messrs van der Meulen, de Jager, Saaiman, and Krige.

Table 3.6: Overview of properties affected by proposed infrastructure (roughly from N to S)

PROPERTY	OWNER		LAND USE
296/RE Adrianople	Mr Rassie Saaiman	Overvaal Rd	Part of operation based near Breyten Residential (leased out); Residential (labour/ tenure); Dryland cropping; Grazing
296/3 Adrianople	Mr Johan vd Meulen	Overvaal Rd	Residential (main dwelling); Residential (tenured); Dryland cropping; Grazing
297/3 Buhrmansvallei		Overvaal Rd	Dryland cropping; Grazing
297/5 Buhrmansvallei		Overvaal Rd	Residential (base farm); Dryland cropping; Grazing
297/4 Buhrmansvallei		Overvaal Rd	Dryland cropping; Grazing
326/5 Klipfontein		De Emigratie Rd	Dryland cropping; Grazing
327/6/RE De Emigratie		De Emigratie Rd	Farm buildings; not inhabited Dryland cropping; Grazing
327/3/RE De Emigratie	Buhrman, Mr Hein	De Emigratie Rd	Residential (farm manager); Leased to Mr Lood de Jager; Dryland cropping; Grazing
296/1 Adrianople	Mr Lood de Jager	De Emigratie Rd	Residential (uninhabited); Residential (tenure); Dryland cropping; Grazing Part of operation based on Uitkomst
296/2 Adrianople	Mr Adrian & Ms Angie Smuts	Overvaal Rd	Residential; Residential (labour/ tenure); Leased out to Mr Jaydee Krige Dryland cropping; Grazing

All the site properties are primarily used for mixed farming purposes and consist of extensive patchworks of cropped areas, managed pasture (hay production) and natural rangeland (veld). Farmsteads are located on 7 of the 10 site properties, 5 of which inhabited by owners, farm managers, or tenants. Small clusters of farm workers' houses and houses belonging to people with tenure rights are located on a few study area properties. The northernmost portion of the site (three properties) is traversed by the Richards Bay railway line. The same properties are affected by the existing Eskom corridor located parallel to the east/ north of the railway line. Primary access to all properties is via either the Overvaal Road (majority) or De Emigratie road. Some of the van der Meulen properties are accessed internally. A brief overview of the relevant properties and associated owners is provided below.

Adrianople 296/RE is owned by Mr Rassie Saaiman. Mr Saaiman's mixed farming operation (Rassie Saaiman Boerdery) is based to the north of the study area, closer to Breyten, but Mr Saaiman visits Adrianople a few times a week. Adrianople is used by Mr Saaiman for cropping and grazing. The farmstead is leased out as long-term accommodation (Saaiman, pers. comm) (Photograph 3.12). Five labourer households reside in a small cluster of small houses near the Overvaal road (Photograph 3.13). Adrianople 296/RE is accessed off the Overvaal Rd. The property is not currently affected by any transmission lines (Photograph 3.14).



Photograph 3.12: Farm house leased out on Adrianople 296/RE (Saaiman)



Photograph 3.13: Farm labourers on Adrianople 296/RE (Saaiman)



Photograph 3.14: Entrance to Adrianople 296/RE (Saaiman) from the Overvaal Road. The maize fields are located on Adrianople 296/3 (van der Meulen)

Mr van der Meulen's (Sr) operation is based on Buhrmansvlei 297/5. The farmstead complex is located approximately 1.2 km to the north of the Overvaal silo. The complex includes two primary dwellings (Messers van der Meulen Jr and Sr) and two apartments (Photograph 3.15). Mr van der Meulen's son in law, Mr de Jager (not the same as Mr Lood de Jager) resides in the farmstead on adjacent Adrianople 296/3 (Photograph 3.16). Three households no longer in the employ of Mr van der Meulen have tenure rights on Adrianople 296/3. They

reside in a small cluster at the intersection of the Overvaal road and entrance road to Buhrmansvlei farmstead (Photograph 3.17).



Photograph 3.15: Primary dwellings on Buhrmansvlei, Overvaal silo in the background



Photograph 3.16: Farmstead on Adrianople 296/3 inhabited by Mr van der Meulen's son in law



Photograph 3.17: Dwellings of ex-labourers and 400 kV line on Adrianople 296/3 at intersection of Overvaal road and entrance road to Buhrmansvlei yard

The extended family farms together. The operation extends beyond the site properties, including own and leased land. Approximately 75% of income is derived from cropping activities. The livestock component includes beef cattle and sheep (Photograph 3.18 and 3.19). The operation provides permanent employment to 30 workers. No workers reside on the properties. Workers are transported in daily from Ermelo (van der Meulen, pers. comm). Access to the van der Meulen properties is off the Overvaal Road and internal roads. Adrianople 296/3 and Buhrmansvlei 297/3 and 297/5 are affected by the Richards Bay railway line and the existing Eskom double-line corridor located parallel to the east. The 88

kV line feeds in/ out of a small substation located on the portion of Adrianople 296/3 located north of the railway lines.



Photograph 3.18: Beef cattle grazing on Adrianople farm (van der Meulen)



Photograph 3.19: Sheep grazing on De Emigratie 327/6/RE (van der Meulen) along the De Emigrate Road

Adrianople 296/1 is owned by Mr Lood de Jager. Mr de Jager's mixed farming operation is based on Uitkomst Farm along the De Emigratie Road near the intersection with the N11, i.e., to the west of the immediate study area. Mr de Jager owns a number of properties, most of which are adjacent to Uitkomst. Mr de Jager leases a number of additional properties, both near Uitkomst and Adrianople 296/1, including De Emigratie 297/3/RE adjacent to the latter from Mr Hein Buhrman (resident in Cape Town). Both properties are farmed as integral part of the larger operation, i.e., used for cropping maize and soy beans and raising livestock (sheep and cattle) (Photographs 3.20 and 3.21). Approximately 82% of the operation's income is derived from cropping activities (Bester-de Jager, pers. comm).



Photograph 3.20: Kraal on Adrianople 296/1 (de Jager)



Photograph 3.21: Pasture and maize fields on Adrianople 296/1 (de Jager)

The farmstead on Adrianople 296/1 is not currently inhabited. A farm manager lives in the farmstead on De Emigratie 297/3/RE. Both farmsteads are accessed directly off the De Emigratie Road. No farm labourers live on the relevant properties. A small cluster of houses belonging to a few households with tenure rights is located just to the east of the Overvaal road on Adrianople 296/1 (Photograph 3.22). The relevant properties are not affected by existing Eskom lines.



Photograph 3.22: Houses of tenured households on Adrianople 296/1 (de Jager)

Adrianople 296/2 is owned by Mr Adriaan Smuts and his sister Ms Angie Smuts. The property is leased out to their stepbrother, Mr Jaydee Krige. The farm yard is located to the west of the Overvaal road and accessed directly from the road (Photograph 3.23). A small cluster of labourers' houses is located to the east of the road. The property is used for mixed farming purposes (Photograph 3.24). It is not currently affected by any Eskom transmission lines.



Photograph 3.23: Dwelling and outbuildings on Adrianople 296/2 (Smuts/ Krige)



Photograph 3.24: Cropped fields on Adrianople 296/2 (Smuts/ Krige)

Turbines are proposed on properties belonging to all site owners (Table 3.7). Most of the infrastructure is proposed on the van der Meulen properties. A total of 27 turbines are proposed on 5 of the 6 van der Meulen properties. A number of the proposed locations (20) appear to be within cropped areas. Substation Alternative 2 would affect rangeland and the marginal portion of a cropped field on Adrianople 296/3.

Table 3.7: Overview of affected by proposed infrastructure

PROPERTY	OWNER	AFFECTED	COMMENT
296/RE Adrianople	Mr Rassie Saaïman	3 turbines	1 turbine in cropped field
296/3 Adrianople	Mr Johan vd Meulen	4 turbines SS Alt 2	3 turbines in cropped fields; Existing Eskom substation; 1 x 88 kV + 1 x 400 kV lines; Traversed by KZN railway line
297/3 Buhrmansvallei		n.a.	Not affected; Existing Eskom 2 x 400 kV lines; Traversed by KZN railway line
297/5 Buhrmansvallei		4 turbines	4 turbines in cropped fields Existing Eskom 2 x 400 kV lines; Traversed by KZN railway line
297/4 Buhrmansvallei		4 turbines	3 turbines in cropped fields
326/5		8 turbines	6 turbines in cropped fields

Klipfontein		1	
327/6/RE De Emigratie		7 turbines	4 turbines in cropped fields
327/3/RE De Emigratie	Buhrman, Mr Hein	5 turbines	2 turbines in cropped fields
296/1 Adrianople	Mr Lood de Jager	8 turbines SS Alt 1	3 turbines in cropped fields
296/2 Adrianople	Mr Adrian & Ms Angie Smuts	2 turbines	1 turbine in cropped field Leased to Mr De Jager

Three turbines are proposed on Mr Saaiman's property (Adrianople 296/RE), 1 of which appears to be located in a cropping area. The respective figures for Messrs. Buhrman (297/3/RE) are 5 and 2; for Mr de Jager (292/1) 8 and 3; and for Mr & Ms Smuts (292/2) 2 and 1. Substation site Alt 1 would affect veld on Adrianople 296/1 (De Jager). (Figure 3.5).

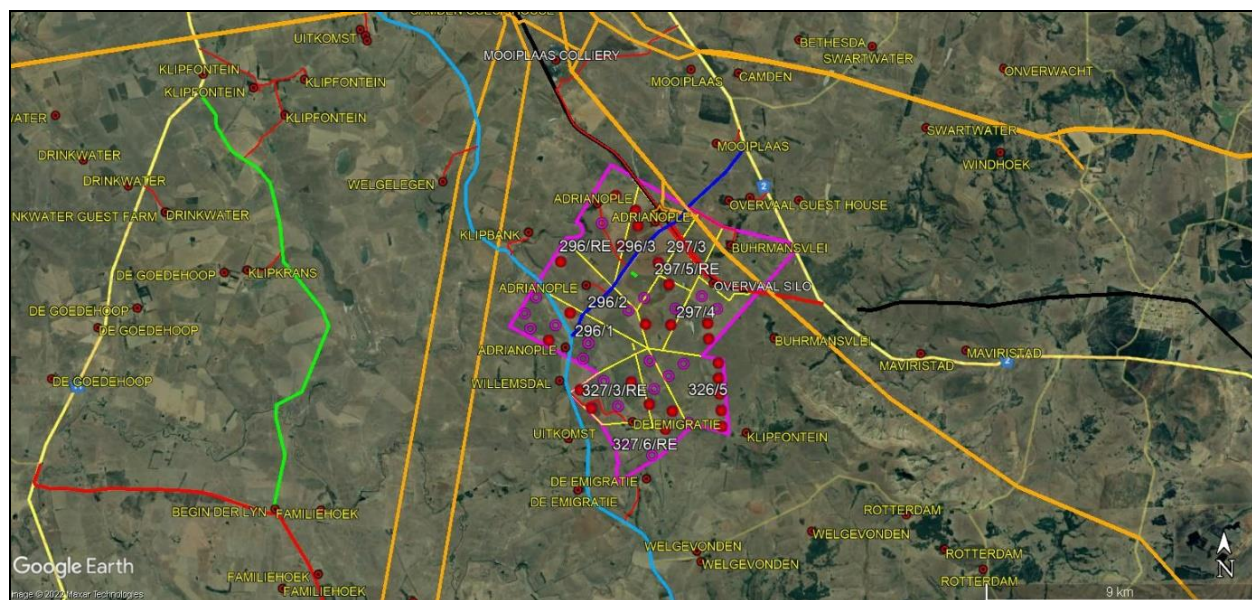


Figure 3.4: Camden II WEF site (pink) and substation Alt 1 (yellow fill) and Alt 2 (green fill) in relation to site properties (yellow) and residential receptors in the broader area. Pink circles indicate proposed turbine locations; solid red dots indicate locations apparently within cropped fields (or managed pasture). Also indicated are existing power lines (orange lines), railway line (black), Overvaal road (dark blue), De Emigratie road (light blue), Familiehoek road (green line), and other gravel roads (red)

3.7.3 Potentially sensitive social receptors

Turbines are proposed within a 500 m to 1 km range of residential receptors on Adrianople 292/RE (Saaiman), 292/1 (de Jager), 292/2 (Smuts) and 292/3 (van der Meulen), as well as on site adjacent Willemsdal and Klipfontein properties. Most of the relevant farmsteads enjoy some measure of screening provided by topography (rolling landscape) and vegetation on yards. The nearest tourist accommodation facility Overvaal Guest House is located between the N2 and the Eskom corridor approximately 3.7 km from the nearest proposed turbines. The substation site alternatives are not located in significant proximity to any receptors (all further than 1 km).

Table 3.8: Distance of proposed turbine and associated substation alternatives to most proximate urban, residential and tourism receptors

RECEPTOR	TURBINE	SS ALT 1	SS ALT 2	COMMENT
Ermelo built edge	17.8 km	22.5 km	22.3 km	Across coal mining area and Camden PS
Camden residential	8.9 km	14.1 km	14.1 km	Existing Tx 470 m; Across Camden PS
N2	3.1 km	6.2 km	5.2 km	Road portion affected by coal truck traffic associated with Camden PS
296/RE Adrianople (farmstead)	670 m ¹⁰	5 km	2.7 km	Camden II WEF site
296/RE Adrianople (labour)	750 m	3.4 km	1.4 km	Camden II WEF site
296/3 Adrianople (farmstead)	570 m	4.2 km	1.9 km	Camden II WEF site
296/3 Adrianople (tenured)	1.8 km	4.9 km	2.8 km	Camden II WEF site; Existing Eskom corridor& railway line
297/3 Buhrmansvallei	n.a.	n.a.	n.a.	Camden II WEF site
297/5 Buhrmansvallei	2 km	4.7 km	3.4 km	Camden II WEF site; Existing Eskom corridor& railway line
297/4 Buhrmansvallei	n.a.	n.a.	n.a.	Camden II WEF site; Existing Eskom corridor& railway line
326/5 Klipfontein	n.a.	n.a.	n.a.	Camden II WEF site
327/6/RE De Emigratie	n.a.	n.a.	n.a.	Camden II WEF site; No inhabited
327/3/RE De Emigratie	800 m	2.5 km	4.9 km	Camden II WEF site
296/1 Adrianople (farmstead)	600 m	2.3 km	3.3 km	Camden II WEF site Farmstead not inhabited
296/1 Adrianople (tenured)	600 m	1.7 km	2.3 km	Camden II WEF site
296/2 Adrianople (farmstead)	1 km	2.5 km	1.6 km	Camden II WEF site
296/2 Adrianople (labour)	640 m	1.5 km	1.3 km	Camden II WEF site
Overvaal Guest House	3.7 km	5.7 km	4 km	Located < 2 of railway line, Eskom corridor and N2
Klipfontein	770 m	4.7 km	6.5 km	
Willemsdal	750 m	2.7 km	4.3 km	
Klipbank (295/RE)	1.5 km	5.2 km	3.8 km	Existing 2 x 400 kV lines
Welgelegen (322/2)	4.7 km	8.4 km	7.1 km	Camden I WEF site
Uitkomst (292/2)	9.6 km	13.5 km	11.9 km	Camden I WEF site

3.7.4 Other renewable energy facilities

The Camden II WEF site is not located within a designated Renewable Energy Development Zone (REDZ). No operational REFs are currently located within significant proximity of the site. The DFF&E's Renewable Energy applications interactive viewer (last updated February 2022) indicates no historic applications within a 35 km radius of the site (Figure 3.6).¹¹

¹⁰ Shading indicates distances of under 2 km (for purposes of reference).

¹¹ https://egis.environment.gov.za/renewable_energy (Updated February 2022).

Two other REFs are currently proposed in proximity to the site (parallel applications), namely the up to 100 MW Camden 1 PV and up to 200 MW Camden I WEF. These projects are also associated with Enertrag.

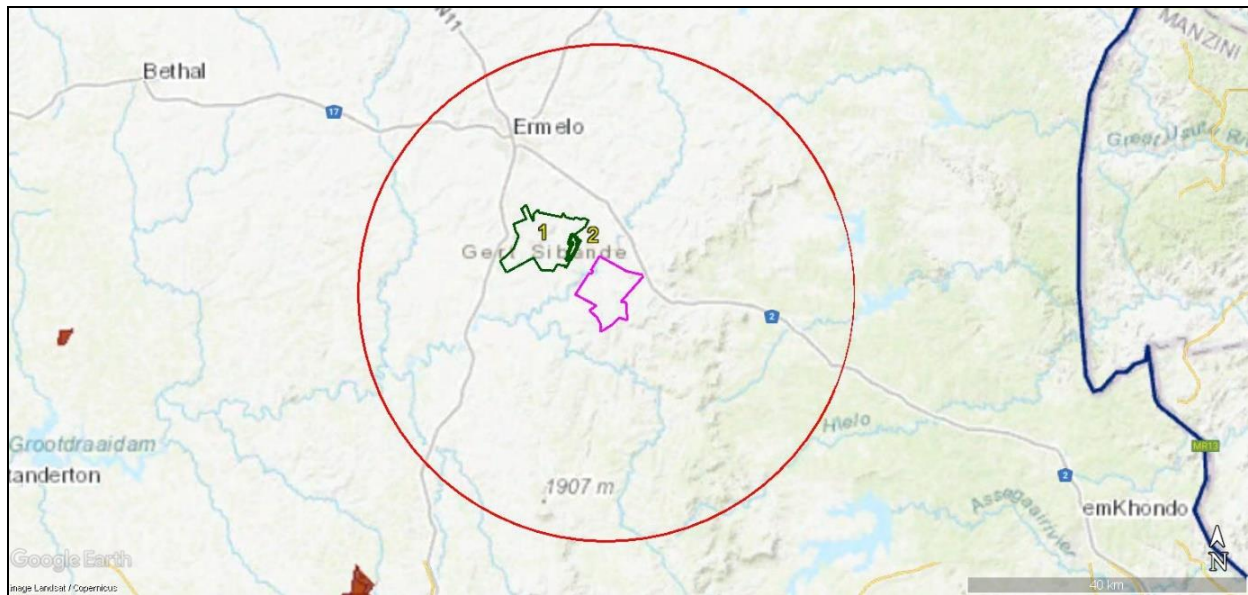


Figure 3.6: Camden II WEF site (pink outline) in relation to proposed Camden I WEF (1) and Camden I PV (2)

SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

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.

The potential social impacts associated with the battery energy storage systems (BESS) and internal substations are negligible and do not have a bearing on the findings of the SIA. The focus of the SIA is therefore on the WEF and associated wind turbines.

4.2 ASSESSMENT OF POLICY AND PLANNING FIT

The development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The development of renewable energy is also supported by the MMSDF. In this regard the SDF acknowledges the importance of the mining sector and notes that it will need to be accommodated over the short to medium term. However, of relevance to the proposed development the SDF refers to green industries and indicates that the existing site of the Camden Power Station and surrounds should be made available for new industrial development in the long term, to manage the long-term impact of the Power Station being decommissioned.

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 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.

4.3.1 Creation of local employment, training, and business opportunities

The construction phase will extend over a period of approximately 18-24 months and create in the region of 100-150 employment opportunities that will benefit members from the local communities in the area, specifically Ermelo. These opportunities will include opportunities for low, semi and highly workers. Most of the employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. 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, specifically Ermelo. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. Based on information from similar projects the total wage bill will be in the region of R 25 million (2022 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.

The capital expenditure will be approximately R 2-3 billion (2022 Rand value) and will create opportunities for local businesses. Due to the presence of the mining and energy sector, there are likely to suitably qualified companies in Ermelo that can provide the required services and products. 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.

The potential benefits for local communities are confirmed by the findings of the Overview of the IPPPP undertaken by the Department of Energy, National Treasury and DBSA (June 2020). The study found that to date, a total of 52 603 job years¹² have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. To date, 42 355 job years for SA citizens were achieved during construction, which is 26% above the planned 33 707 job years for active projects. These job years are expected to rise further since 23BW4 projects are still in or entering, construction.

In terms of benefits for local communities, significantly more people from local communities were employed during construction than was initially planned. For active projects, the expectation for local community participation was 13 284 job years. To date 22 935 job years have been realised (i.e. 73% more than initially planned), with 23 projects still in, or entering, construction. The number of black SA citizens employed during construction also exceeded the planned numbers by 53%.

Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 81%, 43% and 49% of total job opportunities created by IPPs to date. However, woman and disabled people could still be significantly empowered as they represent a mere 10% and 0.4% of total jobs created to date, respectively. Nonetheless, the fact that the REIPPPP has raised employment opportunities for black South African citizens and local communities beyond

¹² The equivalent of a full-time employment opportunity for one person for one year.

planned targets, indicates the importance of the programme to employment equity and the drive towards more equal societies.

The share of black citizens employed during construction (81%) and the early stages of operations (84%) has significantly exceeded the 50% target and the 30% minimum threshold. Likewise, the share of skilled black citizens (as a percentage of skilled employees) for both construction (69%) and operations (80%) has also exceeded the 30% target and minimum threshold of 18%. The share of local community members as a share of SA-based employees was 49% and 68% for construction and operations respectively – exceeding the minimum threshold of 12% and the target of 20%.

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

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	With Enhancement
Extent	Local (2)	Local (3)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Medium (3)
Reversibility	N/A	N/A
Probability	Probable (3)	Highly probable (4)
Significance	Low (21)	Moderate (32)
Status	Positive	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Opportunity to up-grade and improve skills levels in the area.		

Assessment of No-Go option

There is no impact as the current status quo would be maintained.

Recommended enhancement measures

In order to enhance local employment and business opportunities associated with the construction phase the following measures should be implemented:

Employment

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
- Where feasible, efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.
- Before the construction phase commences the proponent should meet with representatives from the MM to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase.

- The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business

- The proponent should liaise with the MM with regards the establishment of a database of local companies, specifically BBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work.

Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

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 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. While it is possible to reduce the risks associated with construction workers it is not possible to totally avoid the potential impacts.

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		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
Probability	Probable (3)	Probable (3)
Significance	Moderate (30)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be entirely eliminated	
Mitigation: See below		
Residual impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent residual/cumulative impacts on the affected individuals and/or their families and the community.		

Assessment of No-Go option

There is no impact as the current status quo would be maintained.

Recommended enhancement measures

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents.
- Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.
- The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase that representatives from local landowners, farming associations, and the local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP.
- The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP.
- The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site.
- The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.

- No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

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 4.3.2. The findings of the SIA indicate that the potential for economically motivated in-migration and subsequent labour stranding is likely to be negligible. The risks associated with the influx of job seekers are therefore likely to be low.

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		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Low (2)
Reversibility	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be entirely eliminated	
Mitigation: See below		
Residual impacts: Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.		

Assessment of No-Go option

There is no impact as the current status quo would be maintained.

Recommended mitigation measures

It is impossible to stop people from coming to the area in search of employment. However, as indicated above, the proponent should ensure that the employment criteria favour residents from the area. In addition:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities.
- The proponent should implement a policy that no employment will be available at the gate.

4.3.4 Risk to safety, livestock, and farm infrastructure

The presence on and movement of construction workers on and off the site poses a potential safety threat to local farmers and farm workers 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 farm 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 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 safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation (3)	Reversible with compensation (3)
Probability	Probable (3)	Probable (3)
Significance	Moderate (30)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: No, provided losses are compensated for.		

Assessment of No-Go option

There is no impact as the current status quo would be maintained.

Recommended mitigation measures

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for.
- All farm gates must be closed after passing through.
- Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.
- The proponent should establish a CoC for workers (see above).
- The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below).
- The proponent should implement a Grievance Mechanism that provides local farmers with an effective and efficient mechanism to address issues related to report issues related to damage to farm infrastructure, stock theft and poaching etc.
- The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.
- Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the CoC. All dismissals must be in accordance with South African labour legislation.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

4.3.5 Nuisance impacts associated with construction related activities

The construction activities on site and movement of heavy construction vehicles during the construction phase has the potential to create noise and dust impacts, damage local roads and create safety impacts for other road users. Based on the findings of the SIA the potential dust and noise impacts associated with the construction phase are likely to be limited. The traffic related impacts associated with the transport of materials to the site can also be effectively managed if the required mitigation measures are implemented.

In terms of impacts to local roads, construction traffic for all projects would need to be co-ordinated with farming activities in order to avoid harvesting periods when unimpeded access to silos at Ermelo and Overvaal is required. The De Emigratie Road and Overvaal Road are of key importance. The critical period is from May to August. The relevant roads also serve as primary access to and link between a number of study area farms, i.e., are used on a daily basis.

Table 4.5: Assessment of the impacts associated with construction related activities

Nature: Potential noise, dust and safety impacts associated with movement of construction related activities and movement of traffic to and from the site		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Low (2)
Reversibility	Reversible (1)	Reversible (1)
Probability	Probable (3)	Low Probability (2)
Significance	Low (21)	Low (12)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: If damage to local roads is not repaired then this will affect the other road users and result in higher maintenance costs. The costs will be borne by road users who were not responsible for the damage.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- Timing of construction activities should be planned to avoid / minimise impact on access to the silos at Ermelo and Overvaal, specifically access along the De Emigratie Road and Overvaal Road. The critical period is from May to August.
- Ongoing communication with land owners and road users during construction period. This should be outlined in the SEP.
- The proponent should implement a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads.
- Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed.
- Repair of all affected road portions at the end of construction period where required.
- Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.

- All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

4.3.6 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 local landowners indicated that the area is very susceptible to grass fires during the winter months (May-October) and that the veld can take up to 3 years to recover to full productivity.

Table 4.6: Risk posed by veld fires to livestock, farm infrastructure and grazing

Nature: Potential loss of livestock and grazing and damage to farm infrastructure associated with increased incidence of grass fires		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation (3)	Reversible with compensation (3)
Probability	Probable (3)	Low Probability (2)
Significance	Moderate (30)	Low (16)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation: See below		
Residual impacts: No, provided losses are compensated for.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The mitigation measures include:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.
- Smoking on site should be confined to designated areas.

- Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy summer months.
- Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.
- Contractor should provide fire-fighting training to selected construction staff.
- No construction staff, with the exception of security staff, to be accommodated on site overnight.
- As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.

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 crops and grazing. However, experience from other WEFs in the Western Cape is that impact on farming operations can be effectively mitigated by the careful planning in the final layout of the proposed WEF and associated components, where possible. The final disturbance footprint can be reduced by careful site design and management of operation. The impact on farmland associated with the construction phase can also 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. Recommended mitigation measures are outlined below.

Affected landowners interviewed indicated that loss of productive farmland should as far as possible be minimised. The establishment of turbines and pylons in cropped areas also has the potential to impact on movement of machinery (planting and harvesting) and aerial crop spraying operations (aircraft). However, as indicated above the use of drones for crop spraying provides an effective alternative. The potential loss of productive farmland will also be offset by compensation paid to the affected landowners.

Local landowners also indicated that the timing / phasing on construction activities should where possible be planned to avoid and or minimise disruption to planting and harvesting operations. Affected land owners should be involved in planning of timing of construction activities. Harvests are typically marketed in advance and farmers are committed to deliver contracted yields. This requires advance planning to determine how much land needs to be cultivated during the season. Consideration should also be given to planning the construction activities so as to ensure arable areas remain productive for as long as possible, i.e., are not withdrawn from production months in advance. Ideally, construction should start after harvesting and be planned to reduce disruptions to the following planting season.

Affected landowners also indicated that new linear infrastructure such as power lines and pipelines should ideally be located along existing cadastral boundaries.

Table 4.7: Assessment of impact on productive farmland

Nature: Potential impact on productive farmland due to construction related activities and movement of traffic on the site		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (3)	Low (2)
Reversibility	Reversible with compensation and rehabilitation (3)	Reversible with compensation and rehabilitation (3)
Probability	Highly Probable (4)	Probable (3)
Significance	Moderate (40)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes	Yes
Mitigation: See below		
Residual impacts: If damage to and or loss of productive land is not avoided and or minimised can impact on viability of farming operations and livelihoods.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The potential impacts associated with damage to, and loss of farmland can be effectively mitigated. The aspects that should be covered include:

- The loss of high-quality agricultural land should be avoided and or minimised by careful planning of the final layout of the proposed WEF facilities, where possible.
- Affected landowners should be notified about the timing of construction related activities in advance.
- The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised.
- An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase.
- All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase.
- The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up by the Environmental Consultants appointed to manage the EIA.
- The implementation of the Rehabilitation Programme should be monitored by the ECO.

4.4 OPERATIONAL PHASE SOCIAL IMPACTS

The following key social issues are of relevance to the operational phase:

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 WEF also reduces 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.

Improved energy security

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. The mining and manufacturing sector have been severely impacted and will continue to be impacted until such time as there is a reliable supply to energy. Load shedding in the first six months of 2015 was estimated to have cost South African businesses R13.72 billion in lost revenue with an additional R716 million was spent by businesses on backup generators¹³. A survey of 3 984 small business owners found that 44% said that they had been severely affected by load shedding with 85% stating that it had reduced their revenue, with 40% of small businesses losing 20% or more of revenue during due to load shedding period¹⁴.

Impact of a coal powered economy

The Green Jobs study (2011) notes that South Africa has one of the most carbon-intensive economies in the world, thus making the greening of the electricity mix a national imperative. The study notes that renewable energy provides an ideal means for reaching emission reduction targets in a relatively easy manner. In addition, and of specific relevance to South Africa renewable energy is not as dependent on water compared to the massive water requirements of conventional power stations, has a limited footprint, and therefore does not impact on large tracts of land, poses limited pollution and health risks, specifically when compared to coal and nuclear energy plants.

The Greenpeace Report (powering the future: Renewable Energy Roll-out in South Africa, 2013), also notes that within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. These include acid mine

¹³ Goldberg, Ariel (9 November 2015). "The economic impact of load shedding: The case of South African retailers" (PDF). Gordon Institute of Business Science. p. 109

¹⁴ "How does load shedding affect small business in SA?". The Yoco Small Business Pulse (3: Q1 2019): 3

drainage from abandoned mines in South Africa and the risk this poses on the country's limited water resources.

Benefits associated with REIPPPP

The overview of the IPPPP (June 2020) indicates that the REIPPPP has attracted R41.8 billion in foreign investment and financing in the seven bid windows (BW1 – BW4, 1S2 and IS2). This is almost double the inward FDI attracted into South Africa during 2015 (R22.6 billion). In terms of local equity shareholding, 52% (R31.5 billion) of the total equity shareholding (R61 billion) was held by South African's across BW1 to BW4, 1S2 and IS2. This equates to substantially more than the 40% requirement. Foreign equity amounts to R 29.5 billion and contributes 49% to total equity. As far as Broad Based Black Economic Empowerment is concerned, Black South Africans own, on average, 33% of projects that have reached financial close, which is slightly above the 30% target.

On average, black local communities own 9% of projects that have reached financial close. This is well above the 5% target. In addition, an average of 21% shareholding by black people in engineering, procurement, and construction (EPC) contractors has been attained for projects that have reached financial closure. This is higher than 20% target. The shareholding by black people in operating companies of IPPs has averaged 24% (against the targeted 20%) for the 68 projects in operation (i.e. in BW1–4). The target for shareholding by black people in top management has been set at 40%, with an average 67% achieved to date. The target has therefore been significantly exceeded.

The total projected procurement spend for during the construction phase was R73.1 billion, while the proposed operations procurement spend over 20 years operational life is estimated at 76.8 billion. The combined (construction and operations) procurement value is projected as R149.9 billion, of which R81 billion has been spent to date. For construction, of the R70.2 billion already spent to date, R57.7 billion is from the 68 projects which have already been completed. These 68 projects had planned to spend R52.9 billion. The actual procurement construction costs have therefore exceeded the planned costs by 9% for completed projects.

Of the R70.2 billion spent on procurement during construction, R59 billion has reportedly been procured from BBBEE suppliers, achieving 87% of total procured. Actual BBBEE spend during construction for BW1 and BW2 alone was R25.5 billion. The R59 billion spent on BBBEE during construction is 15% more than the R 51.1 billion that had originally been anticipated by all IPPs.

Total procurement spend by IPPs from Qualifying Small Enterprises (QSE) and Exempted Micro Enterprises (EME) has amounted to R24.7 billion (construction and operations) to date, which exceeds commitments by 96% and is 30% of total procurement spend to date (while the required target is 10%). QSE and EME's procurement spend for construction was R 22 billion, which is 4.4 times the targeted spend for construction of R4.9 billion during this procurement phase.

In terms of procurement from women-owned vendors to date, 5% of total construction procurement spend has been from woman-owned vendors (against a targeted 5%), and 6% of operational procurement spend has been realised from woman-owned vendors to date, thereby exceeding the targeted 5%. In terms of construction spend, R 3.2 billion was undertaken by women-owned vendors, which is almost double the R 1.9 billion estimated for the construction of projects that have reached financial close.

The REIPPPP has therefore created significant employment opportunities for black South African citizens and local communities beyond planned targets. This highlights the

importance of the programme in terms of employment equity and the creation of more equal societies.

In terms of employment, to date, a total of 52 603 job years¹⁵ have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. 81%, 43% and 49% of total job opportunities created by IPPs to date. However, woman and disabled people could still be significantly empowered as they represent a mere 10% and 0.4% of total jobs created to date, respectively. Nonetheless, the fact that the REIPPPP has raised employment opportunities for black South African citizens and local communities beyond planned targets, indicates the importance of the programme to employment equity and the drive towards more equal societies.

These job years should rise further past the planned target as more projects enter the construction phase. The REIPPPP has also ensured that black people in local communities have ownership in the IPP projects that operate in or nearby their vicinities. The establishment of renewable energy facilities therefore not only address 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.

Table 4.8: Improve energy security and support renewable sector

Nature: Development of infrastructure to improve energy security and support renewable sector		
	Without Mitigation	With Mitigation
Extent	Local, Regional and National (4)	Local, Regional and National (4)
Duration	Long term (4)	Long term (4)
Magnitude	High (4)	High (4)
Reversibility	N/A	N/A
Probability	Highly Probable (4)	Definite (5)
Significance	Moderate (48)	High (60)
Status	Negative	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Overall reduction in CO ₂ emission, reduction in water consumption for energy generation, contribution to the development of the renewable energy sector in South Africa and benefit for economic development and investment.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

Should the proposed grid connection infrastructure be approved the proponent should:

¹⁵ The equivalent of a full-time employment opportunity for one person for one year

- Maximise the number of employment opportunities for local community members.
- Implement training and skills development programs for members from the local community.
- Maximise opportunities for local content and procurement.

4.4.2 Creation of employment and business opportunities

The proposed development will create in the region of 20 full time employment opportunities during the operational phase. Based on similar projects the annual operating budget will be in the region of R 24 million (2022 Rand values), including wages.

Table 4.9: Impact assessment of employment, skills development and business creation opportunities

Nature: Creation of employment, skills development and business opportunities associated with the operational phase		
	Without Mitigation	With Enhancement
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Medium (3)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Highly Probable (4)
Significance	Low (14)	Moderate (36)
Status	Positive	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area		

Recommended enhancement measures

The enhancement measures listed in Section 4.4.1, i.e., to enhance local employment and business opportunities during the construction phase, also apply to the operational phase. In addition, the proponent should investigate providing training and skills development to enable locally based service providers to provide the required services for the operational phase.

4.4.3 Generate income for affected landowners

The proponent will be required to either purchase the land or enter into a rental agreement with the affected landowners for the use of the land for the establishment of the proposed WEF. Based on the findings of the SIA the area is prone to droughts and farming operations can be challenging. Any additional source of income therefore represents a significant benefit for the affected landowner(s). The additional income would assist to reduce the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming

inputs, such as fuel, feed etc. The additional income would improve economic security of farming operations, which in turn would improve job security of farm workers and benefit the local economy.

Table 4.10: Assessment of benefits associated with income generated for affected farmer(s)

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 sheep and farming inputs, such as feed etc.		
	Without Mitigation	With Enhancement
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Medium (3)
Reversibility	N/A	N/A
Probability	Probability (3)	Definite (5)
Significance	Low (21)	Moderate (45)
Status	Positive	Positive
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Support for local agricultural sector and farming		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended enhancement measures

- Implement agreements with affected landowners.
- The loss of high-quality agricultural land should be avoided and or minimised by careful planning in the final layout of the proposed WEF facilities, where possible.

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. The revenue from the proposed WEF 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.

The minimum compliance threshold for SED contributions is 1% of the revenue with 1.5% the targeted level over the 20-year project operational life. For the current portfolio of projects, the average commitment level is 2.2%, which is 125% higher than the minimum threshold level. To date (across seven bid windows) a total contribution of R23.1 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.2 billion. Of the total commitment, R18.8 billion is specifically allocated for local communities where the IPPs operate. With every new IPP on the grid, revenues and the respective SED contributions will increase.

As a percentage of revenue, SED obligations become effective only when operations commence, and revenue is generated. Of the 91 IPPs that have reached financial close (BW1–BW41), 68 are operational. The SED contributions associated with these 68 projects has amounted to R 1.2 billion to date.

In terms of ED and SED spend, education, social welfare, and health care initiatives have a SED focus. SED spend on education has been almost double the expenditure on enterprise development. In this regard IPPs have supported 1 123 education institutions with a total of R312 million in contributions, from 2015 to the end of June 2020. A total of 1 142 bursaries, amounting to R183.8 million, have been awarded by 55 IPPs from 2015 until the end of June 2020. The largest portion of the bursaries were awarded to African and Coloured students (97%), with women and girls receiving 56% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 61%, followed by the Eastern Cape (18%) and Western Cape (14%). Enterprise development and social welfare are the focus areas that have received the second highest share of the contributions to date.

The Green Jobs study (2011) found that the case for renewable energy is enhanced by the positive effect on rural or regional development. Renewable energy facilities located in rural areas create an opportunity to benefit the local and regional economy through the creation of jobs and tax revenues.

The establishment of Community Trusts projects do therefore create significant benefits for local rural communities. However, Community Trusts can also be mismanaged. This is an issue that will need to be addressed when setting up the trust.

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

Nature: Benefits associated with support for local community's form SED contributions		
	Without Mitigation	With Enhancement¹⁶
Extent	Local and Regional (2)	Local and Regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	High (4)
Reversibility	N/A	N/A
Probability	High Probability (4)	Definite (5)
Significance	Moderate (36)	Moderate (55)
Status	Positive	Positive
Reversibility	N/A	
Can impact be enhanced?	Yes	
Enhancement: See below		
Residual impacts: Promotion of social and economic development and improvement in the overall well-being of the community		

Assessment of No-Go option

There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the supporting the social and economic development in the area would be lost. This would also represent a negative impact.

Recommended enhancement measures

To maximise the benefits and minimise the potential for corruption and misappropriation of funds the following measures should be implemented:

- The proponents should liaise with the LM and KHLM to identify projects that can be supported by SED contributions.
- Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community.
- Strict financial management controls, including annual audits, should be instituted to manage the SED contributions.

4.4.5 Visual impact and impact on sense of place

The proposed WEF will impact on the areas existing rural sense of place. However, the impact on the areas sense of place should be viewed within the context of the impact of the Camden Power Station and associated transmission lines on areas sense of place. The areas sense of place has also been impacted by large-sale coal mining operations. The potential visual impact on the areas sense place is therefore likely to be limited.

¹⁶ Enhancement assumes effective management of the community trust

Turbines are proposed within a 500 m to 1 km range of residential receptors on Adrianople 292/RE (Saaiman), 292/1 (de Jager), 292/2 (Smuts) and 292/3 (van der Meulen), as well as on site adjacent Willemsdal and Klipfontein. Apart from Klipfontein and Willemsdal, the relevant properties form part of the WEF site. The nearest tourist accommodation facility Overvaal Guest House is located between the N2 and the Eskom corridor approximately 3.7 km from the nearest proposed turbines. The substation site alternatives are not located in significant proximity to any receptors (all further than 1 km).

Despite the proximity of some turbines to farmsteads, none of the affected landowners interviewed raised concerns about potential visual impacts associated with the proposed project. Most of the local farmsteads are also screened by the rolling topography or trees.

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.		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Reversible with rehabilitation (3)	Reversible with rehabilitation (3)
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (26)	Low (26)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Potential impact on current rural sense of place		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

- The recommendations contained in the VIA should also be implemented.
- Install radar activated civil aviation light system.

4.4.6 Potential impact on property values

As indicated in Section 2.5, a literature review was undertaken as part of the SIA. It should be noted that the review does not constitute a property evaluation study and merely seeks to comment on the potential impact of wind farms on property values based on the findings of studies undertaken overseas. The assessment rating is based on the findings of the review. In total five articles were identified and reviewed namely:

- Stephen Gibbons (April 2014): Gone with the wind: Valuing the Visual Impacts of Wind turbines through house prices. London School of Economics and Political Sciences & Spatial Economics Research Centre, SERC Discussion Paper 159.

- Review of the Impact of Wind Farms on Property Values, Urbis Pty Ltd (2016): Commissioned by the Office of Environment and Heritage, NSW, Australia.
- Yasin Sunak and Reinhard Madlener (May 2012): The Impact of Wind Farms on Property Values: A Geographically Weighted Hedonic Pricing. School of Business and Economics / E.ON Energy Research Center, RWTH Aachen University. Model Working Paper No. 3/2012.
- Martin D. Heintzelman and Carrie M. Tuttle (March 3, 2011): Values in the Wind: A Hedonic Analysis of Wind Power Facilities. Economics and Financial Studies School of Business, Clarkson University.
- Ben Hoen, Jason P. Brown, Thomas Jackson, Ryan Wiser, Mark Thayer and Peter Cappers (August 2013): A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States. Ernest Orlando Lawrence Berkeley National Laboratory.

Based on the findings of the literature review the potential impact of WEFs on rural property values is likely to be low, specifically for farms that are farmed as productive farms. As indicated above, the potential loss of productive land and the associated potential impact on property values can also be minimised by careful planning and siting of wind turbines.

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

Nature: Visual impact associated with the proposed facility and associated potential impact on property values.		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (16)	Low (14)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Potential impact on current rural sense of place and property values		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The recommendations contained in the VIA should be implemented.

4.4.7 Potential impact on tourism

A review of international literature in the impact of wind farms was undertaken as part of the SIA (Section 2.6). The key findings are summarised below. Three articles were reviewed, namely:

- Atchison, (April 2012). Tourism Impact of Wind Farms: Submitted to Renewables Inquiry Scottish Government. University of Edinburgh.
- Glasgow Caledonian University (2008). The economic impacts of wind farms on Scottish tourism. A report prepared for the Scottish Government.
- Regeneris Consulting (2014). Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector.

Based on the findings of the review there is limited evidence to suggest that the proposed WEF would impact on the tourism in the area. As indicated above, the nearest tourist accommodation facility Overvaal Guest House is located between the N2 and the Eskom corridor approximately 3.7 km from the nearest proposed turbines. The area has also been impacted by the Camden Power Station and associated transmission lines and large-scale coal mining.

Table 4.14: Impact on tourism in the region

Nature: Potential impact of the WEF on local tourism operations and activities		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Very Low (1)	Very Low (1)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (14)	Low (14)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Potential impact on current rural sense of place and future tourism opportunities in the area.		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The recommendations contained in the VIA should be implemented.

4.5 CUMULATIVE IMPACT ON SENSE OF PLACE

The potential cumulative impacts on the areas 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. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more wind farms will be visible from one location).

- Sequential visibility (e.g., the effect of seeing two or more wind farms along a single journey, e.g., road or walking trail).
- The visual compatibility of different 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).

The establishment of the Camden I WEF and other solar and wind energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the areas sense of place should be viewed within the context of the impact of the Camden Power Station and associated transmission lines on areas sense of place. The areas sense of place has also been impacted by large-sale coal mining operations. The potential visual impact on the areas sense place is therefore likely to be limited. In addition, none of the affected landowners interviewed raised concerns about potential visual impacts associated with the proposed project. The potential cumulative impact on the areas sense of place is therefore likely to be limited.

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.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (2)	Local and regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	Low (2)
Reversibility	Reversible with rehabilitation (3)	Reversible with rehabilitation (3)
Probability	Low Probability (2)	Probable (3)
Significance	Low (26)	Moderate (36)
Status (positive/negative)	Negative	Negative
Can impacts be mitigated?	Limited potential	
Mitigation: See below		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

- The recommendations contained in the VIA should be implemented.

4.6 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The objective will be to source as many low and semi-skilled workers for the construction phase from the MM, specifically Ermelo. This will reduce the pressure on local services and accommodation in Ermelo. For a single WEF / SEF project ~ 100-150 workers require accommodation. In the event of the construction phase for 2-3 projects overlapping, the total number of workers requiring accommodation would be between 200 and 450. The potential pressure on local services will depend on the number of locally based contractors and workers that are employed during the construction 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. Socio-economic development (SED) contributions also represent an important focus of the REIPPPP and is aimed at ensuring that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. The proposed WEF is also required to contribute a percentage of projected revenues accrued over the 20-year period to SED. This will provide revenue that can be used by the MM to invest in up-grading local services where required. It should also be noted that it is the function of national, provincial, and local government to address the needs created by development and provide the required services. The additional demand for services and accommodation created by the establishment of development renewable energy projects should therefore be addressed in the Integrated Development Planning process undertaken by the MM.

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 WEF in the MM, has the potential to place pressure on local services, specifically medical, education and accommodation.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local (2)	Local and regional (3)
Duration	Short term (2)	Medium term (3)
Magnitude	Low (2)	Medium (3)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Low Probability (2)
Significance	Low (12)	Low (18)
Status (positive/negative)	Negative	Negative
Can impacts be mitigated?	Yes	
Mitigation: See below		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The proponent should assess the availability of accommodation in Ermelo should the project be approved.

4.7 CUMULATIVE IMPACT ON LOCAL ECONOMY

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

The review of the REIPPPP (June 2020) indicates that the SED contributions associated with 68 operational projects has amounted to R 1.2 billion to date. In terms of Enterprise Development (ED), R 7.2 billion has been committed for BW1 to BW4, 1S2 and 2S2. Assuming an equal distribution of revenue over the 20-year project operational life, enterprise development contributions would be R360 million per annum. Of the total commitment, R5.6 billion is specifically committed directly within the local communities where the IPPs operate, contributing significantly to local enterprise development. Up until the end of June 2020 a total of R 384.2 million had already been made to the local communities located in the vicinity of the 68 operating IPPs. This represents 93% of the total R384.2 million enterprise development contributions made to date).

The potential cumulative benefits for the local and regional economy are therefore 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 a number of renewable energy facilities and associated projects, such as the proposed WEF in the MM, will create employment, skills development and training opportunities, creation of downstream business opportunities.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Local and regional (2)	Local and regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (2)	High (4)
Reversibility	N/A	N/A
Probability	Highly Probable (4)	Definite (5)
Significance	Moderate (32)	Moderate (55)
Status (positive/negative)	Positive	Positive
Can impacts be enhanced?	Yes	
Enhancement: See below		

Assessment of No-Go option

There is no impact as it maintains the current status quo.

Recommended mitigation measures

The proponent should assess the availability of accommodation in Ermelo should the project be approved.

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 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.

Table 4.18: Assessment of no-development option

Nature: 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		
	Without Mitigation ¹⁷	With Enhancement ¹⁸
Extent	Local-International (5)	Local-International (5)
Duration	Long term (4)	Long term (4)
Magnitude	Medium (3)	Medium (3)
Reversibility	N/A	N/A
Probability	High Probability (4)	High Probability (4)
Significance	Moderate (48)	Moderate (48)
Status	Negative	Positive
Can impact be mitigated?	Yes	
Enhancement: See below		
Residual impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		

Recommended enhancement measures

The proposed WEF should be developed, and the mitigation and enhancement measures identified in the SIA and other specialist studies should be implemented.

¹⁷ Assumes project is not developed

¹⁸ Assumes project is developed

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

Section 5 lists the key findings of the study and recommendations. These findings are based on:

- A review of key planning and policy documents pertaining to the area.
- A review of social and economic issues associated with similar developments.
- Site visit and interviews with key stakeholders.
- The experience of the authors with other renewable energy projects.

5.2 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 potential social impacts associated with the battery energy storage systems (BESS) and internal substations are negligible and do not have a bearing on the findings of the SIA. The focus of the SIA is therefore on the WEF and associated wind turbines.

5.2.1 Policy and planning issues

The development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The development of renewable energy is also supported by the MMSDF. In this regard the SDF acknowledges the importance of the mining sector and notes that it will need to be accommodated over the short to medium term. However, of relevance to the proposed development the SDF refers to green industries and indicates that the existing site of the Camden Power Station and surrounds should be made available for new industrial development in the long term, to manage the long-term impact of the Power Station being decommissioned.

5.2.2 Construction phase impacts

The key social issues associated with the construction phase include:

Potential positive impacts

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

The construction phase will extend over a period of approximately 18-24 months and create in the region of 100-150 employment opportunities. Members from the local communities in

Ermelo and the MM would qualify for the majority of low skilled and semi-skilled employment opportunities and a number of skilled opportunities. The Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members from the local community. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. The total wage bill will be in the region of R 25 million (2022 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in Ermelo and the MM. The capital expenditure associated with the construction phase will be approximately R 2-3 billion (2022 Rand value). This will create opportunities for local companies and the regional and local economy. Due to the presence of the mining and energy sector, there are likely to suitably qualified companies in Ermelo that can provide the required services and products. 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.

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.

The findings of the SIA indicate that the significance of the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts associated with the proposed construction phase can therefore be effectively mitigated if the recommended mitigation measures are implemented. Table 5.1 summarises the significance of the impacts associated with the construction phase.

Table 5.1: Summary of social impacts during construction phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Creation of employment and business opportunities	Medium (Positive)	Medium (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Medium (Negative)	Low (Negative)
Influx of job seekers	Low (Negative)	Low (Negative)
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Medium (Negative)	Low (Negative)
Increased risk of grass fires	Medium (Negative)	Low (Negative)
Impact of heavy vehicles and construction activities	Medium (Negative)	Low (Negative)
Loss of farmland	Medium (Negative)	Low (Negative)

5.2.3 Operational phase impacts

The following key social issues are of relevance to the operational phase:

Potential positive impacts

- 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.

The proposed project will supplement South Africa's energy and assist to improve energy security. In addition, it will also reduce the country's reliance on coal as an energy source. This represents a positive social benefit.

Potential negative impacts

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

The findings of the SIA indicate that the significance of all the potential negative impacts with mitigation will be **Low Negative**. The potential negative impacts can therefore be effectively mitigated. The significance of the impacts associated with the operational phase are summarised in Table 5.2.

Table 5.2: Summary of social impacts during operational phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Establishment of infrastructure to improve energy security and support renewable sector	High (Positive)	High (Positive)
Creation of employment and business opportunities during maintenance	Low (Positive)	Medium (Positive)
Benefits associated with socio-economic contributions to community development	Medium (Positive)	Medium (Positive)
Benefits for landowners	Low (Positive)	Medium (Positive)
Visual impact and impact on sense of place	Low (Negative)	Low (Negative)
Impact on property values	Low (Negative)	Low (Negative)
Impact on tourism	Low (Negative)	Low (Negative)

5.2.4 Assessment of cumulative impacts

Cumulative impact on sense of place

The establishment of the Camden II WEF and other solar and wind energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the areas sense of place should be viewed within the context of the impact of the Camden Power Station and associated transmission lines on areas sense of place. The areas sense of place has also been impacted by large-scale coal mining operations. The potential

visual impact on the areas sense place is therefore likely to be limited. In addition, none of the affected landowners interviewed raised concerns about potential visual impacts associated with the proposed project. The potential cumulative impact on the areas sense of place is therefore likely to be limited.

Cumulative impact on local services and accommodation

The potential cumulative impact on local services and accommodation will depend on the timing construction phases for the different renewable energy projects in the area. With effective planning the significance of the potential impact was rated as **Low Negative**.

Cumulative impact on local economy

The significance of this impact with enhancement was rated as **Moderate Positive**.

5.2.5 Assessment of 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. The No-Development option is not supported by the findings of the SIA.

5.3 CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings of the SIA indicate that the proposed up to 200 MW Camden II WEF project will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. The project will also contribute to local economic development through socio-economic development (SED) contributions. In addition, the development will improve energy security and reduce the carbon footprint associated with energy generation.

The findings of the SIA also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be **Low Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The up to 200 MW Camden II WEF is therefore supported by the findings of the SIA.

Recommendations

- The loss of high-quality agricultural land should be avoided and or minimised by careful planning of the final layout of the proposed WEF facilities, where possible.
- Affected landowners should be notified about the timing of construction related activities in advance of the commencement of the construction phase.

ANNEXURE A

INTERVIEWS

- Bester-de Jager, Ms. Jolande (2022-03-24). Uitsig and Adrianople 296/1 Farms.
- Buhrman, Mr Hein (telephonic 2022-03-22). De Emigratie 327/3/RE.
- Reyneke, Mr Louis (2022-03-24). Welgelegen farm.
- Reyneke, Ms Petronella (2022-03-24). Welgelegen farm.
- Saaiman, Mr Rassie (2022-03-25). Adrianople 296/RE.
- Van der Meulen, Mr Johan (2022-03-25). Buhrmansvlei, Adrianople 296/2 and De Emigratie farms.
- Zeelie, Mr David (2022-03-24). Klipfontein farm.

REFERENCES

- The National Energy Act (2008).
- The White Paper on the Energy Policy of the Republic of South Africa (December 1998).
- The White Paper on Renewable Energy (November 2003).
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- The National Development Plan (2011).
- Mpumalanga Spatial Development Framework (2019).
- Msukaligwa Municipality Integrated Development Plan (2019-2020).
- Msukaligwa Spatial Development Framework (2019).

INTERNET

- https://egis.environment.gov.za/renewable_energy.
- <https://www.eskom.co.za/sites/heritage/Pages/Camden.aspx>

MAPS

- Chief Directorate National Geo-Spatial Information (2009). 2629DB Ermelo, Ed 4.
- Chief Directorate National Geo-Spatial Information (2009). 2630AC Chrissiesmeer, Ed 3.
- Chief Directorate National Geo-Spatial Information (2009). 2630CA Camden, Ed 3.
- Chief Directorate National Geo-Spatial Information (2009). 2630CC Kalkoenkrans, Ed 3.

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

Assessment of Impacts and Mitigation

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct¹⁹, indirect²⁰, secondary²¹ as well as cumulative²² impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria²³ presented in **Table 0-1**.

Table 0-1: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite

¹⁹ Impacts that arise directly from activities that form an integral part of the Project.

²⁰ Impacts that arise indirectly from activities not explicitly forming part of the Project.

²¹ Secondary or induced impacts caused by a change in the Project environment.

²² Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

²³ The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	0 – 30		31 to 60		61 – 100
Environmental Significance Rating (Negative (-))	Low (-)		Moderate (-)		High (-)
Environmental Significance Rating (Positive (+))	Low (+)		Moderate (+)		High (+)

ANNEXURE C

Tony Barbour

ENVIRONMENTAL CONSULTING AND RESEARCH

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Tony Barbour's has 26 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 260 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition, he is the author of the Guidelines for undertaking SIA's 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 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;

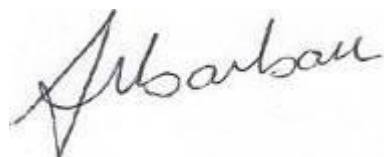
I will comply with the Act, Regulations and all other applicable legislation;

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):

10 May 2022

Date: