

Appendix H.9

SOCIAL IMPACT ASSESSMENT



SOCIAL IMPACT ASSESSMENT

IGOLIDE WIND ENERGY FACILITY

GAUTENG PROVINCE

SEPTEMBER 2023

Prepared for

WSP

by

Tony Barbour and Schalk van der Merwe

Tony Barbour

ENVIRONMENTAL CONSULTING

10 Firs Avenue, Claremont, 7708, South Africa

(Cell) 082 600 8266

(E-Mail) tony@tonybarbour.co.za.

EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

WSP was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed 100 MW Igolide Wind Energy Facility (WEF) and associated infrastructure located approximately 2-5km northeast of Fochville, within the Merafong City Local Municipality (MCLM) in the Gauteng 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

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.

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 key provincial policies.

CONSTRUCTION PHASE

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.

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	Moderate (Positive)	Moderate (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Low (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	Moderate (Negative)	Low (Negative)
Increased risk of grass fires	Moderate (Negative)	Low (Negative)
Impact of heavy vehicles and construction activities	Moderate (Negative)	Low (Negative)
Loss of farmland	Moderate (Negative)	Low (Negative)

OPERATIONAL PHASE

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

Potential positive impacts

- Generate renewable energy.
- Creation of employment opportunities.
- Benefits associated with establishment of community trust.
- Benefits for local landowners.

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, except for the visual impact on sense of place, will be **Low**

Negative. Most of the potential negative impacts can therefore be effectively mitigated.. 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
Generate renewable energy	Moderate (Positive)	High (Positive)
Creation of employment and business opportunities	Low (Positive)	Moderate (Positive)
Benefit associated with community trust	Moderate (Positive)	High (Positive)
Benefits for landowners	Low (Positive)	Moderate (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 IMPACTS¹

Cumulative impact on sense of place

The establishment of the proposed WEF and other renewable energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the area’s sense of place should be viewed within the context of the impact of the existing mining operations on the area’s sense of place. The potential visual impact on the area’s sense place is therefore likely to be **Moderate Negative**.

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**.

DECOMMISSIONING PHASE

Given the relatively small number of people employed during the operational phase (~ 20), the potential negative social impact on the local economy associated with decommissioning will be limited. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative). Decommissioning will also create temporary employment opportunities. The significance is likely to be Low (negative).

¹ Note: The final grid route has not yet been determined. The cumulative assessment does not therefore consider the potential impact of the grid.

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 negative social cost.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings of the SIA indicate that the proposed Igolide WEF will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phases. 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 most of the potential negative impacts associated with both the construction and operational phases are likely to be **Minor Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

Recommendations

- The developers should liaise with the owners of the property to identify a preferred location for the construction camp clusters.
- The developers should liaise with the owners of the property to identify a preferred location for the substation and BESS.

Statement and reasoned opinion

The establishment of the proposed Igolide WEF and associated infrastructure is supported by the findings of the SIA. The recommendations listed above should however be addressed.

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CONTENTS OF THE SPECIALIST REPORT – CHECKLIST

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
(a) details of the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a <i>curriculum vitae</i> ;	Section 1.5, Annexure C
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.6, Annexure D
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	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
(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;	Section 3
(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
(k) any mitigation measures for inclusion in the EMPr;	Section 4
(l) any conditions for inclusion in the environmental authorisation;	Section 4
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 4
(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
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A
(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 apply.	Comply with the Assessment Protocols that were published on 20 March 2020, in Government

	<p>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.</p>
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ACRONYMS

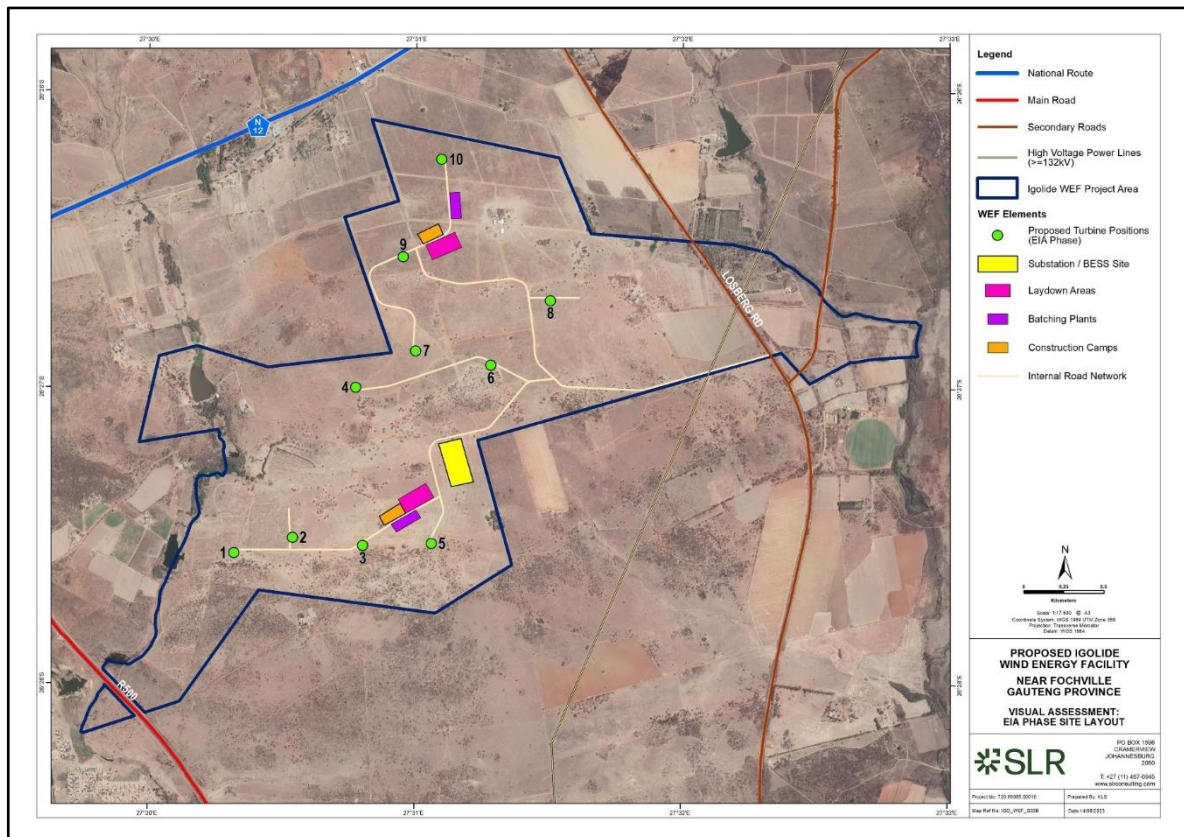
BESS	Battery Energy Storage System
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DM	District Municipality
HD	Historically Disadvantaged
EIA	Environmental Impact Assessment
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
MCLM	Merafong City Local Municipality
MW	Megawatt
SDF	Spatial Development Framework
SIA	Social Impact Assessment
WEF	Wind Energy Facility
WRDM	West Rand District Municipality.

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

WSP was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed 100 MW Igolide Wind Energy Facility (WEF) and associated infrastructure located approximately 2-5km northeast of Fochville, within the Merafong City Local Municipality (MCLM) in the Gauteng Province (Figure 1.1).

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



Source: SLR VIA (2023)

Figure 1.1: Location of Igolide 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 (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.

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

In this regard the study involved:

- Review of socio-economic data for the study area.
- Review of relevant planning and policy frameworks for the area.
- Review of information from similar studies, including the SIAs undertaken for other renewable energy projects.
- Site visit and interviews with key stakeholders.
- Identifying the key potential social issues associated with the proposed project.
- 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.

Annexure A contains a list of the secondary information reviewed. Annexure B summarises the assessment methodology used to assign significance ratings to the assessment process.

1.3 PROJECT DESCRIPTION

The proposed 100 MW Igolide Wind Energy Facility (WEF) will be operated under a Special Purpose Vehicle (SPV), Igolide Wind (Pty) Ltd. The project developer aims to bid the WEF into the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or a similar procurement programme under the Integrated Resource Plan (IRP).

The WEF is located on the following properties within the MCLM:

- Portion 14 of Farm 147 Kraalkop.
- Portion 20 of Farm 147 Kraalkop.
- Portion RE/22 of Farm 147 Kraalkop.
- Portion 8 of Farm 356 Leeuwpoort.
- Portion 57 of Farm 356 Leeuwpoort.
- Portion 65 of Farm 356 Leeuwpoort.
- Portion 66 of Farm 356 Leeuwpoort.

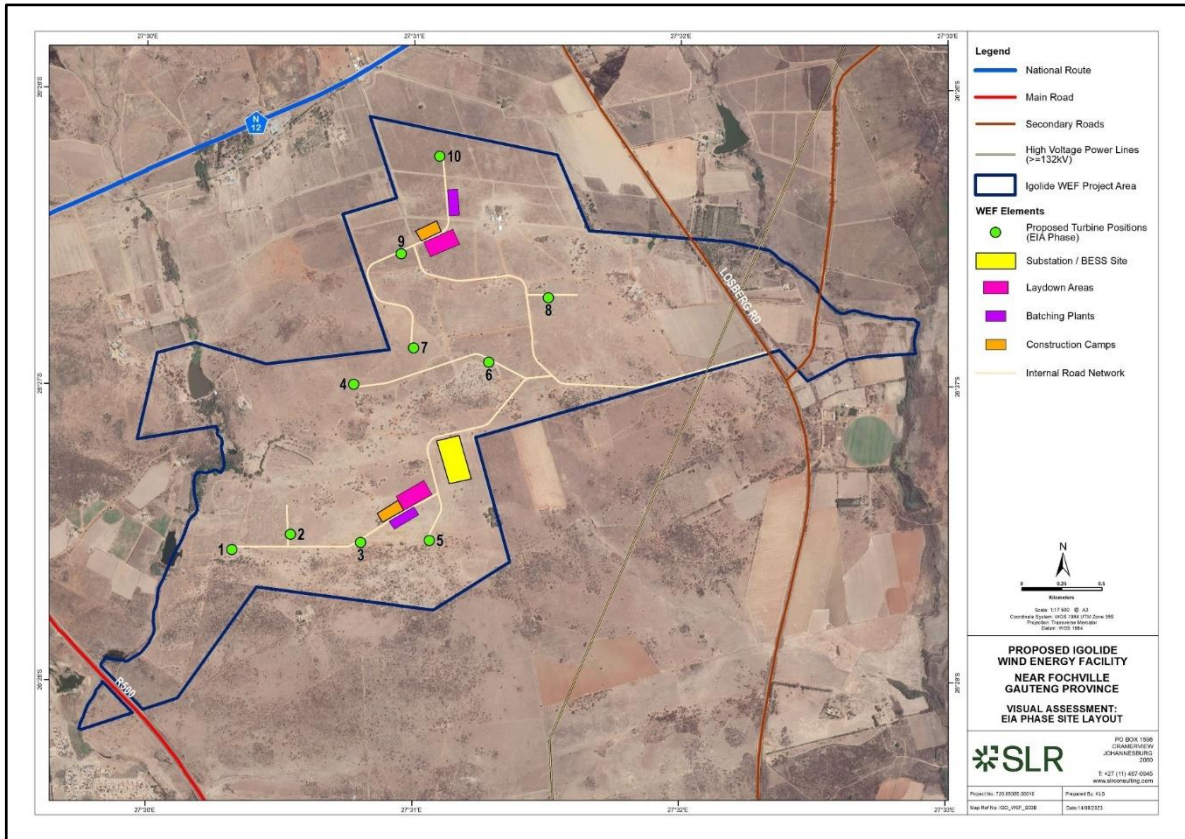
Details of the Igolide WEF are summarised in Table 1.1. The layout is illustrated in Figure 1.2.

Table 1.1: Details of Igolide WEF

Facility Name:	Igolide Wind Energy Facility (WEF)
Applicant:	Igolide Wind (Pty) Ltd
Municipalities:	Merafong City Local Municipality in the Gauteng Province of South Africa
Extent:	680ha
Capacity:	Up to 100MW
No. of turbines (Photograph 1.1):	10
Turbine hub height:	Up to 200m
Rotor Diameter:	Up to 200m
Tip Height :	Up to 300m
Foundation:	Approximately 25m diameter x 3m deep. Excavation approximately 2 200m ³ , in sandy soils due to access requirements and safe slope stability requirements.
Turbine Hardstand:	Hardstands do not require concrete. Area needed will be approximately 1ha per turbine
Tower Type	Steel or concrete towers can be utilised at the site. Alternatively, the towers can be of a hybrid nature, comprising concrete towers and top steel sections.
On-site IPP substation and battery energy storage system (BESS) (Photograph 1.2):	<p>The total footprint for the on-site substation, including the BESS, will be up to 2.5ha in extent.</p> <p>The on-site IPP portion substation will consist of a high voltage substation yard to allow for multiple up to 132kV feeder bays and transformers, control building, telecommunication infrastructure, and other substation components, as required. A 500m buffer around the on-site IPP substation has been identified to ensure flexibility in routing the powerline.</p> <p>The BESS storage capacity will be up to 100MW/400 megawatt-hour (MWh) 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 Engineering, Procurement, and Construction (“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. The BESS components will arrive on site pre-assembled.</p>
Grid (to form part of a separate application for EA)	<p>A single or double circuit 132kV overhead powerline and 132kV switching station (adjacent to the on-site IPP substation) to feed the electricity generated by the proposed WEF into Eskom’s Midas Main Transmission Substation via a 11km overhead line.</p> <p>A corridor of up to 250m in width (125m on either side of the centre line) has been identified for the placement of the up to 132kV single or double circuit power line to allow flexibility in the</p>

	design of the final powerline route, and for the avoidance of sensitive environmental features (where possible).
Cables:	The medium voltage collector system will comprise cables up to and including 33kV that run underground, except where a technical assessment suggests that overhead lines are required, connecting the turbines to the on-site IPP.
Operations and Maintenance (O&M) building footprint:	<p>Operations and Maintenance ("O&M") building footprint to be located near the on-site substation. Typical areas include: Conservancy tanks with portable toilets. Typical areas include:</p> <ul style="list-style-type: none"> - Operations building – 20m x 10m = 200m² - Workshop and stores area – of ~300m² - Refuse area for temporary waste storage and conservancy tanks to service ablution facility. <p>The total combined area of the buildings will not exceed 5 000m².</p>
Construction camps:	The construction camp will house the contractor offices, ablution facilities, mess area, etc., and will have a footprint of 1ha. The construction camp will be demolished after commercial operations date and the area rehabilitated.
Temporary laydown or staging areas:	The laydown area will be used for the storage of equipment or components that will be incorporated into the facility (such as electrical cables) as well as non-facility related equipment and components such as shipping frames, concrete shuttering, etc. The laydown area will also be used for the storage (and filling of vehicles) of diesel fuel.
Cement Batching Plant:	The cement batching plant will be used to mix and blend cement, water, sand and aggregates to form quality concrete to be used for foundations. The cement batching plant will have a footprint of 1ha..
Access and Internal Roads:	<p>Access and internal roads will have a width of 8 - 10m, increasing up to 20m for turning circle/bypass areas to allow for larger component transport. The access and internal roads will be placed within a corridor of up to 20m width to accommodate cable trenches, stormwater channels and turning circle/bypass areas of up to 20m.</p> <p>Existing access roads will be used where possible to minimise impact. Where required, the width of the existing roads will be widened to ensure the passage of vehicles.</p>
Supporting Infrastructure:	<ul style="list-style-type: none"> - Fencing; - Lighting; - Lightning protection; - Telecommunication infrastructure; - Stormwater channels; - Water pipelines; - Offices; - Operational control centre; - Warehouse; - Ablution facilities; - Gatehouse; - Security building;

	<ul style="list-style-type: none"> - Visitor's centre; and - Substation building.
Site coordinates (centre point)	26°27'2.44"S / 27°30'58.82"E



Source: SLR VIA (2023)
Figure 1.2: Layout of Igolide WEF



Photograph 1.1: Typical example of wind turbines



Photograph 1.2: Example of BESS located in storage containers

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.

1.4.2 Limitations

Demographic data

The data from the 2021 Census is not currently available. The 2011 Census and 2016 Household Community Survey has therefore been used.

1.5 SPECIALIST DETAILS

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

The report is divided into five sections, namely:

- Section 1: Introduction.

- Section 2: Summary of key policy and planning documents.
- Section 3: Overview of the study area.
- Section 4: Identification and assessment of key social issues.
- Section 5: Summary of key findings and recommendations.

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 fit²” 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 Renewable Energy (November 2003).
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- The National Development Plan (2011).
- The New Growth Path Framework (2010).
- National Infrastructure Plan (2021).
- Gauteng Provincial Employment, Growth and Development Strategy
- Gauteng Provincial Spatial Development Framework 2030
- Gauteng Integrated Energy Strategy (2012)
- Growing Gauteng Together 2030
- Merafong City Local Municipality Integrated Development Plan (2020)
- Merafong City Local Municipality 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).

² 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 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 Protocol³, 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.

2.2.3 Integrated Resource Plan (2019)

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

³ 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).

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

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

The IRP (2019) notes that 39 730 MW of new generation capacity must be developed. Of the 39 730 MW determined, about 18 000 MW has been committed to date. This new capacity is made up of 6 422 MW under the REIPPP with a total of 3 876 MW operational on the grid. 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 addition, IPPs have commissioned 1 005MW from two Open Cycle Gas Turbine (OCGT) peaking plants. 1 005 MW from OCGT for peaking has also been commissioned (IRP 2019, page 14).

In terms of IRP (2019) 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		
2025						1000	1,600			
2026		-1,219					1,600			
2027	750	-847					1,600	2000		
2028		-475				1000	1,600			
2029		-1,694			1575	1000	1,600			
2030		-1,050		2,500		1000	1,600			
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	<ul style="list-style-type: none"> • 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.
 Committed/Already Contracted Capacity	
 Capacity Decommissioned	
 New Additional Capacity	
 Extension of Koeberg Plant Design Life	
 Includes Distributed Generation Capacity for own use	

Figure 2.1: Summary of energy allocations and commitments based on the 2019 IRP

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 five 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 2022 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.

2.2.4 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.

2.2.5 The New Growth Path Framework

Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. 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 to create jobs, through a series of partnerships between the State and the private sector. The Green Economy is one of the five priority areas, 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.

2.2.6 National Infrastructure Plan

Government adopted a National Infrastructure Plan (NIP) in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. The aim of the NIP is support investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, **electricity plants**, hospitals, schools, and dams will contribute to improved economic growth.

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

- SIP 8: Green energy in support of the South African economy.
- SIP 9: Electricity generation to support socio-economic development.
- SIP 10: Electricity transmission and distribution for all.

The NIP 2050 was gazetted for public comment on 10 August 2021⁴. The first phase of the NIP 2050 focuses on four critical network sectors that provide a platform, namely, energy, freight transport, water, and digital infrastructure. In line with the NDP, the vision for the energy sector is to promote:

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

⁴ Gazette No. 44951

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

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

- SA cannot afford to overspend while dramatically expanding capacity
- Renewables can be built quickly and in modular form thereby avoiding many of the challenges associated with mega projects.
- Trade partners are expected to increasingly impose border carbon taxes harming SA exports.
- SA will need to commit to emission reductions as a global citizen.

2.3 PROVINCIAL AND LOCAL LEVEL POLICY AND PLANNING

2.3.1 Gauteng Provincial Employment, Growth and Development Strategy

The Gauteng Provincial Employment, Growth and Development Strategy (GEGDS) identifies the need for creating accessible and decent work within a growing, sustainable, and inclusive economy as a priority for the province. The GEGDS aims to address the deep structural weaknesses within the economy that has yielded persistent high unemployment and excluded marginalized populations despite the economic growth of the region.

Key aims of GEGDS:

- Provide a framework within which relevant government departments can develop and/or refine their strategic policy interventions or drivers, while creating decent work and building a growing, inclusive economy.
- Identify effective interventions for provincial government to mitigate the impact of economic crises while initiating programmes that can maximise (decent) employment creation in the medium term.
- Address inequality through the investment in people and the progressive realisation of decent jobs.
- Support social cohesion through interventions that directly contribute towards employment creation and a healthy, well-nourished, and safe labour force.
- Highlight the need for effective monitoring, reviewing, and evaluating of the various interventions or drivers.
- To act as the framework that leads to the Gauteng Growth Path, which is the living or real implementation of the GEGDS.

To achieve this GEGDS proposes necessary and profound structural changes to the Gauteng economy that are based on a rapid shift to an endogenous economy rooted in three key factors:

- Innovation.
- Green Growth.
- Inclusivity.

There are three integral components that make up the strategy, namely: the seven foundational provincial priorities, the five strategic pillars, and seven cross-cutting drivers. The foundational provincial priorities of relevance include:

- Creating Decent Work and Building a Sustainable and Inclusive Economy.
- Building Cohesive and Sustainable Communities including Spatial Development.

This GEGDS outlines the strategic interventions by which Gauteng will work to make this innovating, green and inclusive economy a reality. These interventions are organised into five strategic pillars. The strategic pillars of relevance include:

- Transforming the provincial economy through improved efficiency.
- Sustainable employment creation.
- Sustainable communities and social cohesion.

Each pillar contains several government interventions, which enable them to implement this strategy. These are called drivers. Cross-cutting drivers of relevance include:

- Green Economy and Sustainable Energy Usage.
- Innovation and the Knowledge Economy.
- Infrastructure – Strategic, Socio-economic and Bulk.
- Green Jobs.
- Spatial Planning.

2.3.2 Gauteng Provincial Spatial Development Framework 2030

The Gauteng Provincial Spatial Development Framework (GSDF) 2030 aspires to establish a compact urban form that has a balanced, polycentric spatial network, with strong and resilient nodes enabling mutually beneficial exchanges of goods and services, and movement of people as well as the protection of green spaces and sustainable energy use. To support this vision, four spatial development strategies are to be followed:

- Capitalising on proximity.
- Managing new settlement development.
- Building an economic network.
- Creating a viable and productive hinterland.

The effective provision and maintenance of bulk infrastructure, including energy production, is prioritised within the capitalising on proximity strategy. Ten high-priority provincial spatial development proposals are outlined. While none focus specifically on energy production, the following are important in terms of conservation and bulk infrastructure development:

- Municipal urban growth management.
- Strengthening and enhancing agricultural production and agro-processing.
- Actively pursuing environmental management and eco-system protection.
- Boosting and optimising provincial tourism opportunities.

The GSDF notes that the West Rand District Municipality (WRDM) is currently operating at near capacity in terms of energy production and the lack of stable generation capacity from current providers act as a major constraint to economic development and investor confidence. The GSDF also notes that Merafong's electricity network was not designed to supply the developments and extensions that are currently underway in the district.

2.2.3 Gauteng Integrated Energy Strategy (2012)

The aim of the Gauteng Integrated Energy Strategy (GIES) is to direct the energy supply and consumption of the Gauteng province over the next five to forty-five years by integrating and supporting sustainable energy and climate change initiatives, both locally and internationally. The key goals of this strategy include:

- Providing the leadership and institutional framework required to drive the strategy.
- Implementing strong energy efficient measures.
- Facilitating the development and growth of renewable and alternative energy options.
- Supporting the move towards a low carbon economy.
- Prioritizing energy security and access to safe, clean, and affordable energy.
- Developing and growing the alternative and energy efficiency industry as a critical aspect of Gauteng's economy.

The relative policy implications include:

- Shifting to a low carbon economy.
- Maximizing the use of local energy resources.
- Development of the renewable energy industry as an employment creation opportunity.

The GIES hopes to achieve a low carbon economy, Gauteng as a hub of innovation, focused on clean energy technology, decentralised energy generation-micro generation, as well as clean and renewable energy contributing 50% of the total energy mix of the province.

2.2.4 Growing Gauteng Together 2030

Growing Gauteng Together 2030 (GGT2030) is a plan of action realised by the Gauteng government to drive the province towards a more sustainable and inclusive future. The plan includes seven priorities that are to be executed to achieve this vision. The relevant priorities include:

- The Economy, Jobs, and Infrastructure.
- Integrated Human Settlements and Land Release.
- Safety, Social Cohesion and Food Security.
- Sustainable Development for Future Generations.

This vision will be implemented along five developmental corridors of Gauteng. The Western Development Corridor includes WRDM, and the focus is around diversifying the district economy to include tourism, agriculture, and agro-processing, and renewable energy projects.

2.2.5 Merafong City Local Municipality Integrated Development Plan (2020)

The vision for the Merafong City Local Municipality (MCLM) Integrated Development Plan (IDP) is "A prosperous, Sustainable and Community-oriented City". The Key Performance Areas (KPA) adopted by the municipality to realise this vision are:

- KPA 1: Basic Service Delivery
- KPA 2: To Promote Local Economic Development
- KPA 3: To Promote Municipal Transformation & Organisational Development
- KPA 4: To ensure Municipal Financial Viability & Management
- KPA 5: To ensure Good Governance and Public Participation
- KPA 6: Spatial Development Framework

There are various Development Strategies of Merafong Municipality, which are informed by a Strategic Turn-Around plan developed during a strategic review session held in 2018. Of relevance to the project is the Electricity Supply Strategy (2020/2021), which identifies a variety of strategic interventions for the municipality. The Strategic Turnaround Plan is aligned to 14 regional outcomes, with Outcome 1: Provision of Basic Service Delivery as well as Outcome 8: Sustainable Environment being relevant to the project. The MCLMIDP notes that the status of the current Energy Plan needs to be re-assessed to integrate with the greater West Rand Plan.

2.2.6 Merafong City Local Municipality Spatial Development Framework (2019)

Merafong Spatial Development Framework (MSDF), forms part of a hierarchy of plans that consolidate into the IDP. It concentrates on the spatial aspects of development planning and identifies the opportunities and constraints associated with the district. The Merafong City's SDF proposes the following structuring tools:

- Improve urban efficiency and rectify Apartheid spatial disparities through realigning the urban structure of Merafong settlements into three distinct urban areas.
- Improve urban and rural liveability where basic needs are met, the cost of living is bearable, amenities and employment are accessible, and urban space is aesthetically pleasing and healthy.
- Facilitate sustainable economic growth and diversification, through identified strategic nodes, which include a bio-energy eco-industrial park.
- Protect natural and agricultural resources to ensure a sustainable coexistence between urban, mining, agricultural and ecological land uses.

Opportunities in the MSDF of relevance to the project include a Bioenergy Agro-Industrial Park and the Merafong Solar Farm Cluster Concept. Additionally, the adaptation of unsustainable, unused, or old mines and mine dumps for reuse or rehabilitation also presents an opportunity. The mines Driefontein North and Kusasaletu/Elandsrand were identified as particularly promising for the establishment of solar farms or other renewable energy sources.

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 (December 2021), 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 December 2021. 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.

The Integrated Resource Plan for electricity (IRP) provides South Africa's long-term plan for electricity generation. It primarily aims to ensure security of electricity supply, minimise the cost of that supply, limit water usage and reduce greenhouse gas (GHG) emissions, while allowing for policy adjustment in support of broader socio-economic developmental imperatives. The IRP 2019 was promulgated in October 2019 and replaced the IRP 2010 as the country's official electricity infrastructure plan.

It calls for 37 696MW of new and committed capacity to be added between 2019 and 2030 from a diverse mix of energy sources and technologies as ageing coal plants are decommissioned and the country transitions to a larger share of renewable energy. By 2030, the electricity generation mix is set to comprise of 33 364MW (42.6%) coal, 17 742MW (22.7%) wind, 8 288MW (10.6%) solar photovoltaic (PV), 6 830MW (8.7%) gas or diesel, 5 000MW (6.4%) energy storage, 4 600MW (5.9%) hydro, 1 860MW (2.4%) nuclear and 600MW (0.8%) concentrating solar power (CSP). Additionally, a short-term gap at least 2000MW is to be filled between 2019 and 2022, thereby further raising new capacity requirements, while distributed or embedded generation for own-use is positioned to add 4 000MW between 2023 and 2030. The IRP is intended to be frequently updated, which could impact future capacity allocations from various energy sources and technologies.

Energy supply

By the end of December 2021, the REIPPPP had made the following significant impacts.

- 6 323 MW of electricity had been procured from 92 RE Independent Power Producers (IPPs) in BW1-4.
- 5 661 MW of electricity generation capacity from 85 IPP projects has been connected to the national grid.
- 71 073GWh 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 85 projects that have reached COD, 77 projects have been operational for longer than a year. The energy generated over the past 12-month period for these 77 projects is 14 117GWh, which is 95% of their annual energy contribution projections (P50) of 14 924GWh over a 12-month delivery period. Thirty-one (31) of the 77 projects (40%) have individually exceeded their P50 projections.

Comparatively, the following statistics were presented at the REIPPPP Bid Window 6 Bidders Conference on 7 July 2022 by the IPP Office based on data as of March 2022 following seven bid rounds (IPP Office, 2022⁵):

- 92 IPPs have been selected as preferred bidders.
- 6 323 MW of electricity capacity procured.
- 5 826 MW already operational from 87 IPPs.
- 74 805 GWh energy generated by Renewable Energy sources.

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 R0.94/kWh, while solar PV has dropped with 75% to R1.14/kWh between BW1 and BW4.

Prices contracted under the REIPPPP for all technologies are well below the published REFIT prices. The REIPPPP has effectively translated policy and planning into delivery of clean energy at very competitive prices. As such it is contributing to the national aspirations of secure, affordable energy, lower carbon intensity and a transformed 'green' economy.

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.

⁵ IPP Office (2022). RENEWABLE ENERGY INDEPENDENT POWER PRODUCER PROCUREMENT PROGRAMME (REIPPPP) BID WINDOW 6 BIDDERS' CONFERENCE, 7 JULY 2022 [online]. Accessed July 2022. <https://www.ipp-renewables.co.za/PressCentre/GetPressRelease?fileid=16a21004-f9fd-ec11-9578-2c59e59ac9cd&fileName=BW6%20Bidders%20Conference%20Consolidated.pdf>.

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 costs⁶), including interest during construction, of projects under construction and projects in the process of closure is R209.6 billion (this includes total debt and equity of R209 billion, as well as early revenue and VAT facility of R0.5 billion).

The REIPPPP has attracted R42 billion in foreign investment and financing in the seven bid windows (BW1 – BW4). 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.

Comparatively, based on the information presented at the REIPPPP Bid Window 6 Bidders Conference on 7 July 2022 by the IPP Office (IPP Office, 2022), approximately R209.6 billion investment has been attracted for energy infrastructure in all bid windows; and as at March 2022 an actual R1.9 billion contribution was realised for socio-economic development.

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. South African (local) equity shareholding across BW1-4 equates to 52% (R31.4 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 R29.6 billion and contributes 49% of total equity.

The REIPPPP also contributes to Broad Based Black Economic Empowerment (BBBEE) and the creation of black industrialists. In this regard, Black South Africans own, on average, 34% of projects that have reached financial close (BW1-BW4), which is 4% 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 30% (against the targeted 20%) for the 85 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 68% 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

⁶ 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)

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, qualifying communities will receive R25.5 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 projected income for the first seven bid windows (BW1-BW4) was structured as equal payments overtime, it would represent an annual net income of R1.27 billion per year.

Income to all shareholders only commences with operation of the facility. Revenue generated to date by the 85 operational IPPs amounts to R149.9 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 during the construction phase was R71.1 billion, while the projected operations procurement spend over the 20 years operational life is estimated at 75.2 billion. The combined (construction and operations) procurement value is projected as R146.3 billion of which R92.1 billion has been spent to date. For construction, of the R71.1 billion already spent to date, R71 billion is from the 85 projects which have already been completed. These 85 projects had planned to spend R64.2 billion. The actual procurement construction costs have therefore exceeded the planned costs by 11% 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%.

The majority of the procurement spend to date has been for construction purposes. Of the R76 billion spent on procurement during construction, R64.3 billion has reportedly been procured from BBBEE suppliers, achieving 84.6% 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 R64.3 billion spent on BBBEE during construction is 30% more than the R49.7 billion that had originally been anticipated by all IPPs procured in BW1-4.

Total procurement spend by IPPs from QSE and EMEs has amounted to R28.1 billion (construction and operations) to date, which exceeds commitments by 250% and is 30% of total procurement spend to date (while the required target is 10%). QSE and EME's procurement spend for construction was 31% of construction procurement to date and 26% of operational procurement, exceeding the 10% targets set. QSE and EME share of

construction procurement spend totals R23.8 billion, which is 5.4 times the planned spend for construction of R4.4 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 4.1 billion was undertaken by women-owned vendors, which is almost double the R 1.8 billion expected to be spent 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 Content⁷

The report notes that the REIPPPP 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 R71.1 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 R66.3 billion or 45% of total project value (R148.2 billion for all bid windows).

Actual local content spend reported for IPPs that have started construction amounts to R63.3 billion against a corresponding project value (as realised to date) of R127.2 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 R63.3 billion local content spend reported by active IPPs is already 96% of the R66 billion local content expected. This is with 6 projects still in construction, and 85 of the 91 active projects having reached COD (i.e. 93% of the active portfolio complete). For the 85 projects that have reached COD, local content spend has been R 58.72 billion of a committed R58.67 billion, which is 0.1 more than the planned local spend.

Leveraging employment opportunities

To date, a total of 63 291 job years⁸ have been created for South African citizens, of which 48 110 job years were in construction and 15 182 in operations. These job years should rise further past the planned target as more projects enter the construction phase. Employment opportunities across BW1-4 are 143% of the planned number during the construction phase (i.e. 33 707 job years), with 6 projects still in construction

⁷ Local content is expressed as a % of the total project value and not procurement or total project costs.

⁸ The equivalent of a full-time employment opportunity for one person for one year

and employing people. The number of employment opportunities is therefore likely to continue to grow beyond the original expectations.

By the end of December 2021, 85 projects had successfully completed construction and moved into operation. These projects created 44 172 job years of employment, compared to the anticipated 30 488. This was 45% 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 96% 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.

To date, 48 110 job years for SA citizens were achieved during construction, which is 43% above the planned 33 707 job years for active projects. These job years are expected to rise further since 6 projects are still in 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 25 272 job years have been realised (i.e. 90% more than initially planned), with 6 projects still in, or entering, construction. The number of black SA citizens employed during construction also exceeded the planned numbers by 74%.

Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 81%, 44% and 48% 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 (85%) 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 (71%) and operations (82%) 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 48% and 70% for construction and operations respectively – significantly 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%, which is 101% higher than the minimum threshold level. To date (across BW1-4) a total contribution of R22.8 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.1 billion. Of the total commitment, R18.5 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–BW4), 85 are operational. The SED contributions associated with these 85 projects has amounted to R 1.8 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 1 388 education institutions with a total of R437 million in contributions, from 2015 to the end of June 2021. A total of 1 276 bursaries, amounting to R210.8 million, have been awarded by 67 IPPs from 2015 until the end of June 2021. The largest portion of the bursaries were awarded to African and Coloured students (97.4%), with women and girls receiving 56.3% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 57.2%, followed by the Eastern Cape (20.2%) and Western Cape (14.1%). 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 BW1-4, amount to R7.2 billion. Assuming an equal distribution of revenue over the 20-year project operational life, enterprise development contributions would be R358 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.

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. A total contribution of R504.1 million has already been made to the local communities (i.e. 94%of the total R537.9 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. 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 15.1 million tonnes CO₂ (MtonCO₂) based on the 14 835 GWh energy that has been generated and supplied to the grid over this period. This represents 75% of the total projected annual emission reductions (20.5MtonCO₂) achieved with only

partial operations. A total of 72.1 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	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).

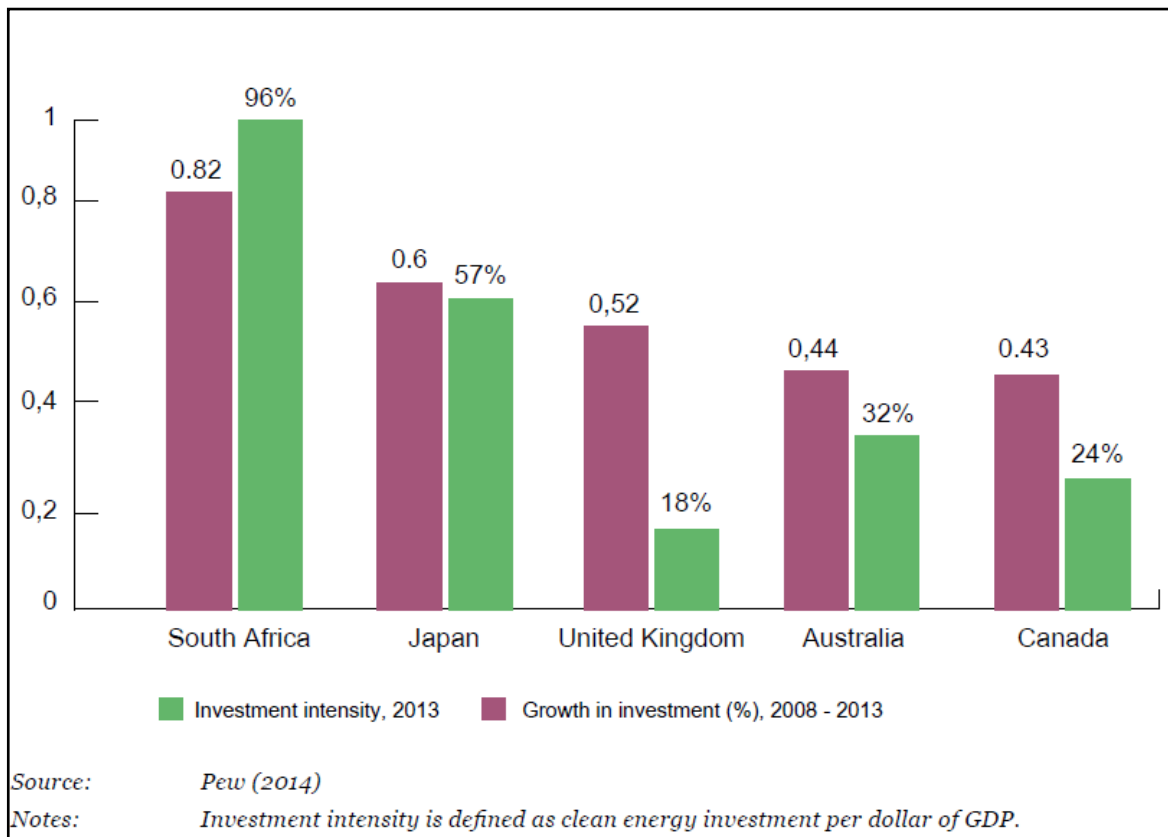


Figure 2.1: South Africa leads as a clean energy investment destination

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 from wind farms in South Africa⁹

In her thesis, Tait¹⁰ 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.

⁹ Similar benefits are also likely to be associated with solar energy projects.

¹⁰ 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 Merafong City Local Municipality (MCLM), which falls within the West Rand District Municipality (WRDM) in the Gauteng Province. The WRDM is made up of three category B local municipalities which include Merafong, Mogale, and Rand West municipalities. Randfontein is the administrative seat of the WRDM. The administrative seat of the MCLM is Carletonville.



Figure 3.1: Location of the Merafong City Local Municipality within Gauteng Province

3.3 PROVINCIAL CONTEXT

The proposed site is located in the Gauteng Province, which is the smallest province in South Africa. Gauteng covers an area of 18 183 km², which only constitutes approximately 1.5% of South Africa total land area. The province is divided into two district municipalities (DM) and three metropolitan municipalities (MM). Gauteng's DMs include Sedibeng and West Rand. The three MM include Tshwane, Johannesburg, and Ekurhuleni. The site itself is located in the WRDM.

Population

Despite having the smallest surface area, Gauteng is home to approximately a quarter of South Africa's population (Community Household Survey, 2016). The province has a population of 13 399 724 inhabitants. Of the five municipalities, Johannesburg MM has the largest population (36.9%), followed by Ekurhuleni MM (25.2%), Tshwane MM (24.4%), Sedibeng DM (7.2%), and West Rand DM (6.3%). The majority of the population in the Gauteng Province are Black African (80.4%), followed by White (13.6), Coloured (3.3%), and Indian or Asian (2.7%).

In terms of age, 43.5% of the Gauteng population is between 15 and 39 years old, which is the highest age distribution, followed by 26.1% of those aged 40–64 years, 24.7% of those 14 and younger, while only 5.6% comprised those aged 65 years and older. Similarly, this pattern is also seen across all districts in the province. More specifically, Merafong, and the broader West Rand District, had the highest proportion of persons aged 15-64 years. Additionally, Gauteng's working age population (15-64) has declined from 72% in 2011 to 66.5% in 2016 while the proportion of persons over 65 years has doubled from 4.3% to 8.7% within the same period.

Education

Based on the information contained in the GSDF, 75.9% of persons 20 years and older had some secondary schooling in Gauteng. Persons achieving matric or higher in Gauteng made up 52.4%, which was about 20% greater than the national rate. Around 10% of those over 20 years had some higher-level schooling, with the highest proportion observed in Tshwane (13.2%) followed by Johannesburg (10.8). Approximately 7.8% of Gauteng adults have no schooling in comparison to South Africa's 18.1%. The Local Economic Development for Gauteng indicates that Sedibeng district has the lowest proportional adult education attainment levels, with 9.2% of the adult population having no form of schooling.

Gauteng also has the highest portion (14.3%) of highly skilled formal employees in South Africa. Linked to this, is Gauteng's high rate of employment (50.6%), which is 1.3 times greater than the national rate (38.9%). This reflects Gauteng's role as the economic hub of South Africa and its importance for the overall GDP of the country.

Economic development

Gauteng has a high Human Development Index (HDI) figure (0.76) and follows the Western Cape (0.78) as the second highest province in South Africa. Since 1996, Gauteng's HDI has grown steadily, indicating an increase in the overall standard of living over the past two decades. It is important to note that there is a disparity between the different population groups, with the HDI for Whites being significantly higher (0.90) than African groups (0.68). This reflects the ongoing consequences of the historical inequalities begotten from South Africa's apartheid past.

According to the Men, Women and Children: Findings of the Living Conditions Survey (2015) Gauteng has the second lowest proportion of adults living below the upper-bound

poverty line (33.2%). Gauteng's poverty gap has decreased from 17% in 2000 to 11.4% in 2010. The alleviation of poverty is one of the key challenges for economic development. Investment in people, through education and skill development, welfare, housing, and transport infrastructure is pivotal to the eradication of poverty and inequality.

In terms of per capita income, the Gauteng Province has the highest per capita income of all nine provinces, however, income distribution is extremely skewed, with a high percentage of the population living in poverty. Gauteng's Gini coefficient is 0.62, compared to South Africa's 0.63 makes it slightly more equal than the country as a whole.

Economic sectors

Although the smallest province in South Africa, Gauteng contributes over 30% of the country's GDP, and around 10% of the total GDP of sub-Saharan Africa. The financial, real estate and business services sector is the largest contributor to the provincial GDP, contributing approximately 22.8% in 2013. This highlights the province's importance as the financial seat of South Africa. Gauteng is home to over 100 foreign and local banks' head offices, stockbrokers, and insurance giants.

The manufacturing and wholesale sectors are also key economic sectors, contributing 16.5% and 12.6% to the provinces GDP respectively. It is estimated that around 40% of South Africa's manufacturing and finance activity is done in Gauteng, as well as around 30% of the country's whole sale, retail, motor trade and accommodation.

Employment

The first quarter labour market snapshot for 2022 showed that in Gauteng employment has increased across six of the 10 sectors with key drivers including the Manufacturing, Community Services, and Trade Sectors. Employment in the mining sector has also increased to above pre-COVID levels in this time. In contrast, employment in the Private Households as well as Construction and Transport sectors has decreased in recent years, which mirrors national trends.

3.4 DEMOGRAPHIC OVERVIEW

Population

Despite having the smallest surface area, Gauteng is home to approximately a quarter of South Africa's population (Community Household Survey, 2016). The province has a population of 13 399 724 inhabitants. Of the five municipalities, Johannesburg MM has the largest population (36.9%), followed by Ekurhuleni MM (25.2%), Tshwane MM (24.4%), Sedibeng DM (7.2%), and West Rand DM (6.3%). The majority of the population in the Gauteng Province are Black African (80.4%), followed by White (13.6), Coloured (3.3%), and Indian or Asian (2.7%).

In terms of age, 43.5% of the Gauteng population is between 15 and 39 years old, which is the highest age distribution, followed by 26.1% of those aged 40–64 years, 24.7% of those 14 and younger, while only 5.6% comprised those aged 65 years and older. Similarly, this pattern is also seen across all districts in the province. More specifically, Merafong, and the broader West Rand District, had the highest proportion of persons aged 15–64 years. Additionally, Gauteng's working age population (15–64) has declined from 72% in 2011 to 66.5% in 2016 while the proportion of persons over 65 years has doubled from 4.3% to 8.7% within the same period.

Households and house types

Based on the information from the 2016 Community Survey there were a total of 79 834 households in the MCLM. Most of the households reside in formal houses (81.3%). The figure for the MCLM is higher than the district proportion (76.3%), but lower than the Provincial (81.4%) figure. Approximately 17.2% of the households in the MCLM reside in shacks or informal dwellings, and 1% in traditional dwellings. Around 25% of households in the MCLM reside in government subsidised dwellings.

Based on the information from the 2016 Community Household Survey 29.2% of the households in the MCLM are headed by females. The figure for MCLM was lower than the District and Provincial figures of 31.7% and 35.9% respectively.

Household income

Based on the data from the 2011 Census, 16% of the population of the MCLM had no formal income, 4% earned less than R 4 800, 5.9% earned between R 5 000 and R 10 000 per annum, 11.1% between R 10 000 and R 20 000 per annum, and 14.9% between R 20 000 and 40 000 per annum. This indicates that almost half of the population earns less than R 40 000 per annum. Around 26.4% of the population earns between R 40 000 and R 75 000, which represents the largest income bracket for the region. Just under 20% of the population earns between R75 000 and R 1 200 000.

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 43% of the households in the MCLM live close to or below the poverty line. This figure is lower than the provincial level of 53.8%.

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 MCLM. This in turn impacts on the ability of the MCLM 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 MCLM 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 figure in 2011 for the MCLM was 17.4%. The figures also indicate that a large portion of the population are not economically active, namely 32.7%. These figures are similar to the official unemployment rate for the Gauteng Province (18.1%) and West Rand District (17.8%). The lower unemployment rate seen in the MCLM has been linked to both job opportunities in mining related activities as well as high municipality out-migration rates. The MCLMIDP notes that this migration was due to the low quality of life and low economic growth in the region. This means that individuals who are unable to find work within the MCLM tend to migrate to other parts of the country rather than remain within the district.

Unemployment Rate in South Africa averaged 26.32% from 2000 until 2021, reaching an all-time high of 34.90 % in the third quarter of 2021 (StatSA). Even more concerning, the Youth Unemployment Rate in South Africa averaged 54.21% from 2013 until 2021,

reaching an all-time high of 64.40 % in the second quarter of 2021. The current rates in the MCLM are therefore likely to be significantly higher than the 2011 rates. These rates will also have been exacerbated by the impact of COVID-19 pandemic.

According to IDP (2012), the mining sector is the largest employer in the MCLM at 25.4%, followed by the trade sector (20.6%), finance and business sector (14.4%), and community and social services sector (13%). Important to note is that while other sectors of the local economy have grown, there has been a significant reduction in sectorial employment of the mining sector since 2006. This has been the result of the global economic downturn coupled with unstable and fluctuating exchange rates and commodity prices.

Education

Based on the information contained in the GSDF, 75.9% of persons 20 years and older had some secondary schooling in Gauteng. Persons achieving matric or higher in Gauteng made up 52.4%, which was about 20% greater than the national rate. Around 10% of those over 20 years had some higher-level schooling, with the highest proportion observed in Tshwane (13.2%) followed by Johannesburg (10.8). Approximately 7.8% of Gauteng adults have no schooling in comparison to South Africa's 18.1%. The Local Economic Development for Gauteng indicates that Sedibeng district has the lowest proportional adult education attainment levels, with 9.2% of the adult population having no form of schooling.

Gauteng also has the highest portion (14.3%) of highly skilled formal employees in South Africa. Linked to this, is Gauteng's high rate of employment (50.6%), which is 1.3 times greater than the national rate (38.9%). This reflects Gauteng's role as the economic hub of South Africa and its importance for the overall GDP of the country.

3.5 MUNICIPAL SERVICES

Electricity

Based on the information from the 2016 Community Survey 89.2% of households in the MCLM had access to electricity. Of this total 59.1% had in-house prepaid meters and 22.8% have conventional in-house meters.

Access to water

Based on the information from the 2016 Community Survey 94% of households were supplied by a regional or local service provider, while 3.1% relied on their own supply. This indicates that municipality supplied water is more dominant compared to other sources. The provincial and district figures for water provided by a service provider were 95.3% and 88.5% respectively.

Sanitation

Based on the information from the 2016 Community Survey, 89.4% of households have access to flush toilets, while 0.6% had no access to any toilet facilities. The figures in terms of access to flush toilets are higher than provincial (88%) and District (85.5%) figures.

Refuse collection

Based on the information from the 2016 Community Survey, 77.4% of households have their refuse collected on a regular basis by a local authority or private company, while 3.6% relied on communal dumps, 6.4% use their own dumps, and 11.9% were not serviced. The provincial and district figures for refuse collection provided by a service

provider on a regular basis were 85.2% and 81% respectively. The figures for the MCLM are therefore lower than the district and provincial service levels.

3.6 HEALTH AND COMMUNITY FACILITIES

The WRDM has 66 health care facilities, with nine of them located in MCLM. In the WRDM, 13 of the 45 clinics are located in Merafong, along with one of two district hospitals, and one of three Community Health Care Facilities. The regional hospital of the district is located in Mogale City. In terms of disability prevalence within the district, persons with disability made up 8% of the population, which was higher than the provincial prevalence rate of 6.7%.

3.7 ECONOMIC OVERVIEW

Mining

Despite mining sector contributing only 3.3% of Gauteng's GDP, mining sits at the core of the WRDM and contributes over 50% of Gross Value Add. This is prevalent in MCLM, as not only does one in four people in the region rely on mining for employment, but mining sector also contributes to 29.1% GDP locally. Gold and uranium are the primary materials mined in the region.

Manufacturing

Around 40% of South Africa's manufacturing is done in Gauteng, and the manufacturing sector contributes over 16% to the overall GDP of the province. Locally, despite sectoral employment only contributing 7.2% the MCLM manufacturing sector has grown significantly since 2011 and contributed 20.8% to local GDP in 2016.

Finance, Real Estate, and Business Services

The finance and business sector is growing steadily and contributed 13.8% to MCLM GDP in 2016. This has resulted in the decline in the number of people employed in the mining sector since 2011 being offset by the growth in employment in this sector as well as the trade sector during this time.

Renewable energy

The Merafong Growth and Development Strategy offers an outline for the future development of the area, and both the Green Economy and Industrial Beneficiation have been identified as significant drivers to revitalise the economy and mining towns of West Rand. The Merafong Solar Farm Cluster Concept and Bio-energy farm proposes a Solar Farm Cluster and Bio-energy farm in Merafong City, in order to develop a renewable energy sector and reindustrialise and create opportunities in local downstream sectors like manufacturing industries and reduce electricity costs and carbon footprint in both private and public sectors.

3.8 OVERVIEW OF STUDY AREA

3.8.1 Introduction

The Igolide WEF site is located ~ 2.5km to the north-east of the town of Fochville in the Merafong City Local Municipality (LM) in the south-western portion of Gauteng Province (Figure 3.2). Merafong City is one of three LMs which constitute the West Rand District Municipality (DM). The mining town of Carltonville, located approximately 13 km north-west of the site, is the administrative seat of the Merafong City LM, and the largest settlement in the LM. Several small mining settlements are scattered across the LM.

Randfontein, the administrative seat of the West Rand DM, is located approximately 30 km north-east of the site.

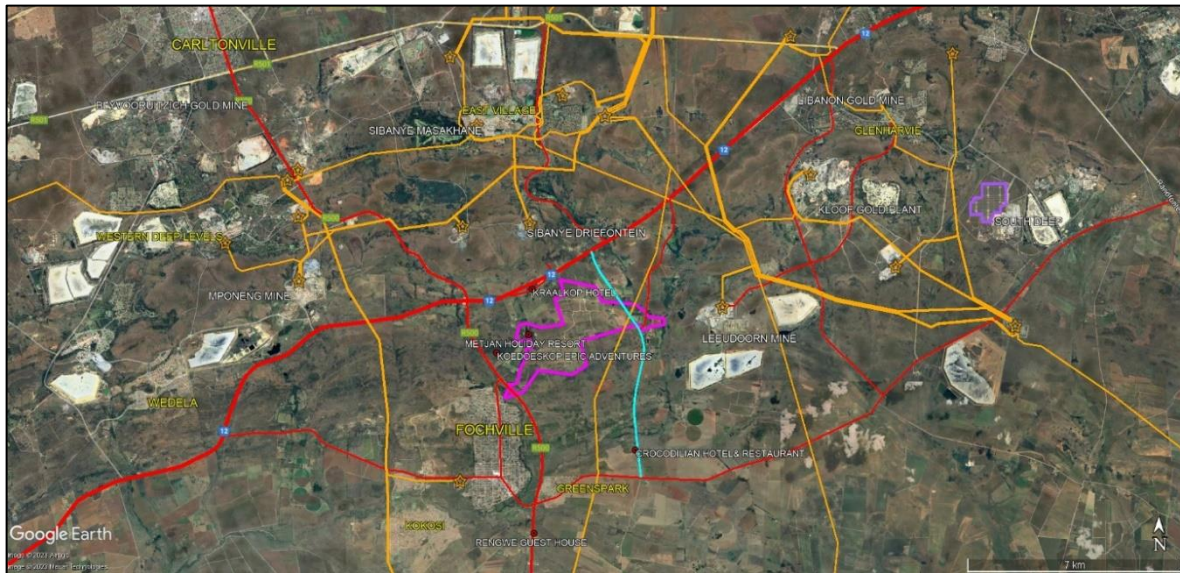


Figure 3.2: Igolide WEF site (pink) in relation to local settlements, mines, key roads (red, Losberg Road light blue), existing Eskom lines (orange), and operational solar PV SEF at South Deep mine (purple). The white areas are slimes and processing dams associated with mining operations.

The key roads in the study area are the roughly west-east aligned N12 (Potchefstroom-Soweto) and the north-south aligned R500 (Carltonville -Parys). The study area is accessed directly off both roads as well as the Losberg tar road. Losberg Road is aligned north-south and links the N12 (north) to the west-east aligned Loopspruit Avenue (extended) (south). Loopspruit Avenue intersects with the R500 just to the south of Fochville and continues east to link up with the Randfontein-Vereeniging Road (Randfontein Road) near South Deep gold mine to the east (Photograph 3.1 and 3.2).



Photograph 3.1: View towards Fochville from R 500



Photograph 3.2: Entrance to Fochville from R 500

Fochville consists of four spatially separate areas, namely the historic Fochville settlement (1920) to the west of Kraalkopspruit (stream) and the R500, Kokosi (two separate areas) to its west and south-west, and the smaller Greenspark to the east of the R500 to its south-east. Kokosi and Greenspark are residential areas. Retail and commerce are largely located in Fochville and concentrated along the 'loop' route (Losberg Ave/ Loopspruit Ave) intersecting with the R500 to the north and south of the town (respectively). A modest mall (President Mall) is located at the intersection of Losberg Avenue and Loopspruit Avenue. Other facilities include a small hospital (Fochville Hospital), a public library, a police station, and a traffic department. Like the broader area, the town's economy is largely underpinned by mining and agriculture.

The key land uses in the broader study area are mining and agriculture. The broader study area forms part of Far West Witwatersrand Gold Fields, of which Carltonville is the main mining town in the area and forms part what was the most productive gold producing area in the world. The landscape context is dominated by historic and ongoing mining activities. The world's deepest mine, Mponeng Gold Mine (~4 km) is located approximately 6 km north-west of the Igolide site. Sibanye's large Leeudoorn Mine is located approximately 1 km east of the site.

The study area is located in the western Highveld. The area around Fochville is mainly comprised of grassveld, but also includes mountain bushveld (Photograph 3.3). Livestock farming predominates in the immediate study area. Cropping activities are concentrated in the vicinity of natural watercourses such as the Kraalkopspruit and Loopspruit, both of which traverse the Igolide site. Fodder and cash crops such as maize and soy are grown, mainly under irrigation. The study area is considered good cattle country, but small stock is also kept. Veld carrying capacities are high, 6 ha per head of cattle¹¹. The bushveld/ grassveld ecotone provides habitat for a range of game species. Game is kept on several properties in the study area - including directly to the south of the site - but commercial hunting appears to be restricted to the site properties. The veld is susceptible to veld fires, especially in winter. The grazing resource may take more than one growing season to recover to full productivity.

¹¹ <https://gis.elsenburg.com/apps/cfm/#>



Photograph 3.3: View towards site from Fochville

The study area rural settlement pattern is concentrated along public roads (N12, the R500 and Losberg Road), and the courses of the Kraalkopspruit and Loopspruit. Properties are accessed directly off the relevant roads. A few businesses (fuel station, hotel, butchery, garage) are located along the N12 portion between the R500 and Losberg Road intersections >260 m north of the site (Photograph 3.4). The nearest turbine would be located approximately 1.5 km northeast of the Fochville built edge, and the substation/ BESS complex approximately 2.7 km.

Tourism facilities in the study area mainly cater to local and regional patrons and passing traffic. Facilities include the Metjan Holiday Resort on the Igolide site (see below), Kraalkop Hotel along the N12, the Crocodilean Hotel and Restaurant (and wedding venue) along Kraalkop Road (3.5 km south-east of the nearest turbine), and Koedoeskop Epic Adventures located adjacent and to the west of the Igolide site. Koedoeskop offers paintball and trails for offroad vehicles and mountain biking. Koedoeskop is accessed off the R500. As indicated, the broader landscape context is dominated by historic and ongoing mining. It is therefore less sensitive to visual and sense of place impacts. No protected natural areas are located in significant proximity to the site.

Due to the widespread presence of large mines, there are numerous Eskom lines located in the broader study area, specifically the in the area to the north of the N12 (Photograph 3.5). The immediate study area (and one site property, Leeuwpoort 356/57) is currently only affected by a single 400 kV line near the Losberg Road. No large substations or operational renewable energy facilities are currently located in the immediate study area.



Photograph 3.4: Kraalkop Petrol station on N12



Photograph 3.5: Eskom power lines in the general study area

3.8.2 Affected properties

The Igolide WEF site consists of seven properties, namely portions 8/RE, 14 and 20 of Kraalkop 147; and portions 8, 57, 65 and 66 of Leeuwpoot 356. The site straddles both the R500 (a small section) and the Losberg Road (Figure 3.3). The wind turbines and associated infrastructure (BESS etc) are located in the central site portion of the site between the two roads. Turbines are proposed on all properties apart from 356/66. Construction terrain cluster Alternative 1 straddles the boundary between 356/66 and

356/8, while Alternative 2 and the substation/BESS complex are proposed on 147/14. Site access is proposed directly off the Losberg Road. The proposed on-site project road network will require upgrades to existing internal farm roads as well as the construction of new road portions.

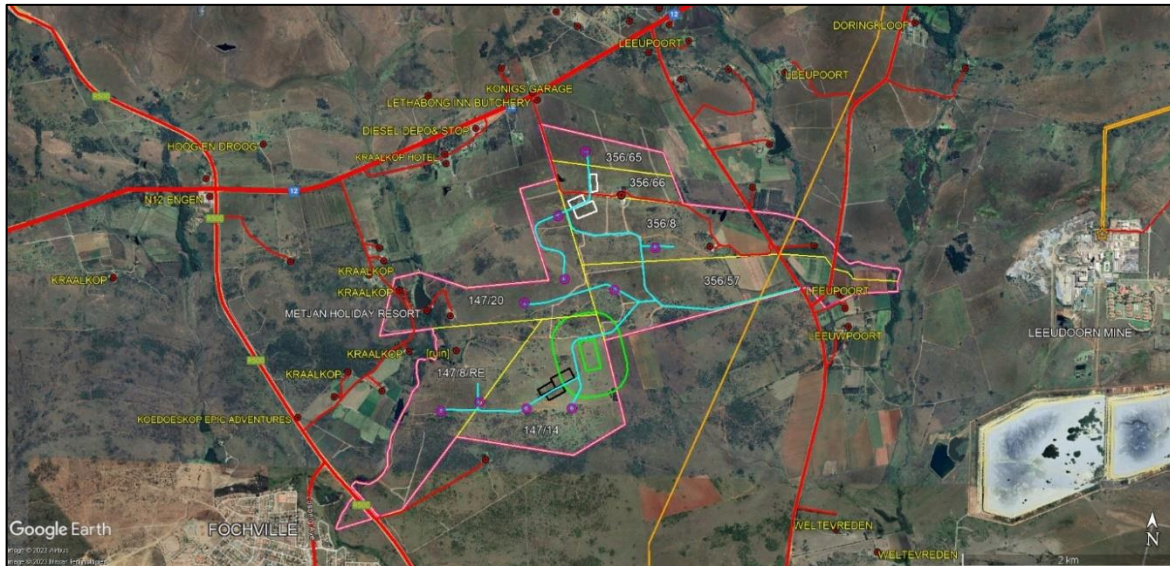


Figure 3.3. Igolide site properties (yellow outlines) in relation to settlement pattern, key roads (red) and existing Eskom lines (orange). Also indicated are proposed turbines (pink circles), substation hub and 500 m buffer (green), construction sites alternatives 1 (white), and 2 (black), and project roads (light blue)

The site properties are owned by Metjan Erfenis ('Heritage') (3 directors) and are used for residential, mixed farming, commercial hunting, and tourism purposes (Photograph 3.6). Metjan provides full time employment to 9 tenured workers (in addition to the directors). Inhabited dwellings are located on Kraalkop 147/20 (development area site portion) and Leeuwoort 356/57 (site portion east of Losberg Road). The structures on 356/8 are not currently inhabited, but the owners intend to lease out the farmstead (east of Losberg Rd) as long-term accommodation in future. The farmstead on 147/8/RE is no longer habitable.

The mixed farming operation is diverse, and includes small stock, beef and dairy cattle, game, a small piggery, and cropping activities (Photograph 3.6). Grazing by game and cattle spatially dominates (around 90%). Other activities are concentrated on the property portions on either side of Losberg Road. These include irrigated cropping areas used for fodder production as well as cash crops such as sugar beans and soy. The farming operation's main store complex and kraals are located on 356/66. Stores are also located on 356/8. The two clusters are accessible from both the N12 and Losberg Road via internal (Metjan) roads. Neither of these clusters are located along proposed project roads. The main store/ kraal complex is however located approximately 170 m from (to the east) of the proposed construction phase site Alternative 1.

The varied topography and veld make it possible to stock a diverse range of game species. Internal boundaries have been removed on much of the Metjan properties between the R500 and Losberg Road (i.e., site development portion). The hunting operation is focused on local hunters ('biltong hunters'), including bow hunters. Hunting only occurs within the statutory hunting season, namely from May to August (4 months),

but accounts for approximately 56-70% (exclusive of accommodation) of the larger Metjan operation's income (directors, pers. comm). Metjan also offers a butchering and meat processing service and accommodation (at the Metjan resort). Apart from hunting, Metjan also offers game drives. The proposed Alternative 2 construction terrain cluster as well as the substation/BESS hub are proposed in an area associated with the game farming activities, including hunting (directors, pers. comm).

The Metjan Holiday Resort is located along an instream dam on the Kraalkopspruit (stream), near the main farmstead on 147/20. The dam has been stocked with fish. The resort's chalets provide self-catering accommodation for 20 people. Other amenities include an indoor swimming pool, a reception hall ('hunting hall') and a private church (located at the main farmstead). The resort is used by hunters but is also popular with local and regional anglers (dam), and for weekend 'break-aways.' It has several patrons who return every year. The resort is currently booked out until the end of the year. The resort and dam are located in a depression and would be screened from the proposed development activities and infrastructure by the natural topography (directors, pers. comm). Both the resort and inhabited dwellings on 147/20 are primarily accessed via a short access road off the N12 and would thus not be affected by any project-related traffic.



Photograph 3.6: View looking south from N12 towards site with lodge in middle ground

3.8.3 Other renewable energy facilities

The Igolide WEF site is not located within a Renewable Energy Development Zone (REDZ). The DFFE's Renewable Energy Applications website¹² identifies only one historic REF application within a 30 km radius of the site, namely a 200 MW solar PV project north of the N12 proposed by Sibanye Gold (Figure 3.4). In as far as could be established, only one operational REF is currently located within 30 km of the site,

¹² https://egis.environment.gov.za/renewable_energy

namely a solar PV SEF located ~11 km northeast of the site associated with the South Deep gold mine. A WEF is also proposed next to the South Deep SEF.

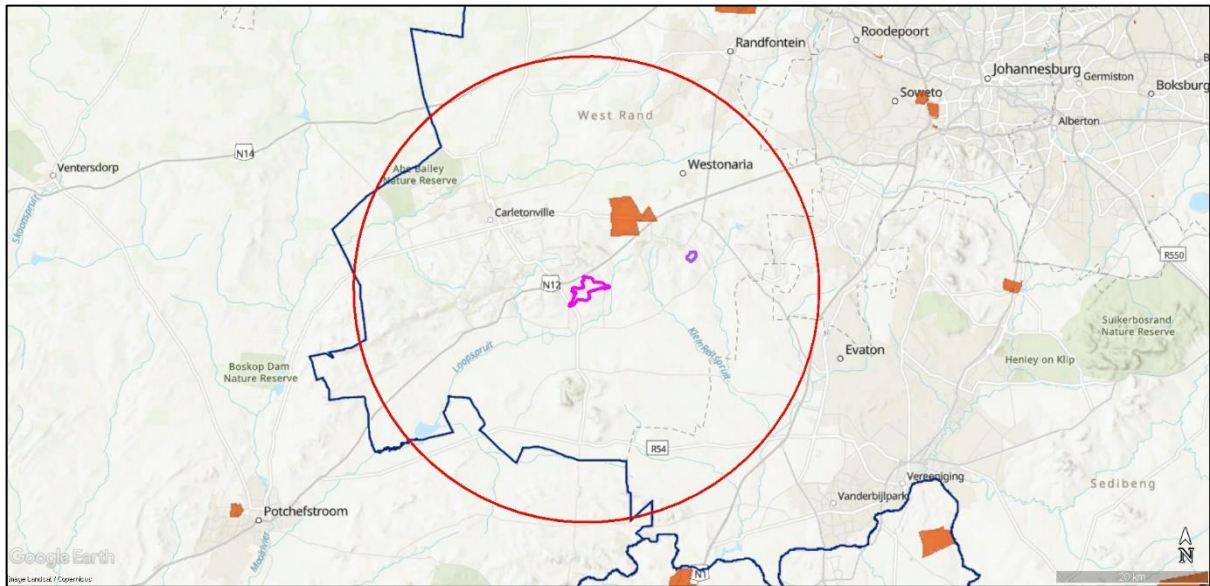


Figure 3.4: Igolide site (pink outline) in relation to historic REF applications within a 30 km radius of the site. Also indicated is an operational PV SEF (purple) (Source: DFFE)

SECTION 4: OVERVIEW OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

Section 4 provides an assessment of the key social issues identified during the study. The identification of key issues was based on:

- Review of project related information, including other specialist studies.
- Site visit and interviews with key interested and affected parties.
- Experience/ familiarity of the author with the area and local conditions.
- Experience with similar projects.

The assessment section is divided into the following sections:

- Assessment of compatibility with relevant policy and planning context (“planning fit”).
- Assessment of social issues associated with the construction phase.
- Assessment of social issues associated with the operational phase.
- Assessment of social issues associated with the decommissioning phase.
- Assessment of the “no development” alternative.
- Assessment of cumulative impacts.

The focus on the assessment is on the wind turbines. Based on experience the most significant social issues are associated with wind turbines. Separate assessments have not been undertaken of the different components of the WEF, such as the BESS.

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 provincial and municipal policies.

4.3 CONSTRUCTION PHASE SOCIAL IMPACTS

Potential positive impacts

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

Potential negative impacts

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

4.3.1 Creation of local employment, training, and business opportunities

The construction phase will extend over a period of approximately 18 months and create in the region of 60 employment opportunities. A percentage of the employment opportunities will benefit members from the local communities in the area, specifically Fochville and Charltonville. 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.

The total wage bill will be in the region of R 12 million (2023 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 associated with the construction phase will be approximately R 1 billion (2023 Rand value). Due to the presence of the mining sector, there are likely to qualified companies in Fochville and Charltonville 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 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 (December 2021). The study found that to date, a total of 63 291 job years¹³ have been created for South African citizens, of which 48 110 job years were in construction and 15 182 in operations. By the end of December 2021, 85 projects had successfully completed construction and moved into operation. These projects created 44 172 job years of employment, compared to the anticipated 30 488. This was 45% more than planned.

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 25 272 job years have been realised (i.e. 90% 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 74%.

Table 4.1: Impact assessment of employment 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)

¹³ The equivalent of a full-time employment opportunity for one person for one year.

Status	Positive	Positive
Can impact be enhanced?	Yes	
<p>Enhancement:</p> <p>Employment</p> <ul style="list-style-type: none"> • 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 as 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. <p>Business</p> <ul style="list-style-type: none"> • The proponent should liaise with the MCLM with regards the establishment of a database of local companies, specifically BBBEE 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. <p>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</p> <p>Residual impacts: Opportunity to up-grade and improve skills levels in the area.</p>		

Assessment of No-Go option

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

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. The potential impact on the local community is therefore likely to be negligible.

While the risks associated with construction workers at a community level will be low, at an individual and family level they may be significant, especially in the case of contracting a sexually transmitted disease or an unplanned pregnancy. However, given the nature of construction projects, it is not possible to totally avoid these potential impacts at an individual or family level.

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	Low (2)	Low (2)
Reversibility	With rehabilitation/mitigation (3)	With rehabilitation/mitigation (3)
Probability	Probable (3)	Probable (3)
Significance	Moderate (27)	Low (24)
Status	Negative	Negative
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be entirely eliminated	
Mitigation:		
<ul style="list-style-type: none"> • 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 contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP. • 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. 		

<ul style="list-style-type: none"> 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. <p>No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site</p>
<p>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.</p>

Assessment of No-Go option

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

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 4.4.2. Given the location and relatively small size of the project the potential for large scale economically motivated in-migration and subsequent labour stranding is likely to be negligible.

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:

It is not 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, in consultation with the MCLM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The MC should also include the other proponents of solar energy projects in the area.
- 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.

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.

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. Stock theft in the area was identified as a key issue.

Minimising the potential impact of construction activities on the game farming and hunting activities was also raised as a key issue. ~ 60-70% of income generated by the IMetjan's operations is linked to hunting activities between May and August (4 months). The Metjan directors indicated that they cannot afford to shut down the hunting operation during construction. The owners indicated that it would not be possible to isolate game in camps during construction. Hunting during the construction phase would also pose a potential safety risk to construction workers.

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. As indicated below, the impact on hunting operations can also be mitigated. The most effective option would be close the hunting operations for a season to allow for the construction of the WEF and associated infrastructure and compensate the owners for loss of hunting related revenue. This would address the impact on owners and address safety risks to workers. The developers have indicated that impact on hunting operations has been addressed in the lease agreement.

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	
<p>Mitigation</p> <ul style="list-style-type: none"> • The developer should compensate the directly affected landowners for impact during the construction phase. • 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 directly affected farmers whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. • 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 MC and 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. 		
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.

4.3.5 Increased risk of grass fires

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

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

Nature: Potential 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	Medium (3)	Low (2)
Reversibility	Reversible with compensation (3)	Reversible with compensation (3)
Probability	Probable (3)	Low Probability (2)
Significance	Moderate (30)	Low (12)
Status	Negative	Negative
Can impact be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> • 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 directly affected farmers 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 winter 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. 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. • No construction staff, with the exception of security staff, to be accommodated on site overnight. 		

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.

4.3.6 Nuisance impacts associated with construction related activities

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

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

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		
<ul style="list-style-type: none"> • 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 key farming activities, including planting and harvesting operations. • The proponent should establish a MC to monitor the construction phase and the implementation of the recommended mitigation measures. The MC should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts. • Ongoing communication with landowners 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 roads on the project property at the end of construction period where required. 		

<ul style="list-style-type: none"> 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.
<p>Residual impacts: No, provided losses are compensated for.</p>

Assessment of No-Go option

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

4.3.7 Impacts associated with loss of farmland

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

In terms of construction related impacts the Metjan directors indicated that the location of both proposed construction terrain clusters (Alternative 1 and 2) was not acceptable. Alternative 1 is located 160 m to the west of the main stores complex and kraal on Leeuwpoort 356/8 and 356/66. The Metjan directors indicated that the location of Alternative 1 would impact on current farming and hunting activities. In addition, from a security perspective Alternative 1 is located too close to stores and kraal and the presence to construction workers would pose a risk to these operations. Alternative 2 is in a key hunting area and would impact on hunting activities (May to August). The owners also indicated that the site too isolated and central (internal) from a security point of view. The owners identified alternative areas and have discussed these with the developers.

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

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the project etc. will damage farmlands and result in a loss of farmlands for grazing / crops.		
	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:

- The developers should liaise with the owners of the property to identify suitable alternative locations for the construction camp clusters.
- The loss of high-quality agricultural land should be avoided and or minimised. The recommendations of the agricultural / soil assessment should be implemented.
- Affected landowners should be consulted 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.

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.

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 energy 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 development 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. The Minister of Mineral Resources and Energy, Gwede Mantashe, indicated in February 2023 that the cost of load shedding was estimated at R1 billion a day¹⁴. The South African Reserve Bank indicated in February 2023 that stage 3 and stage 6 loadshedding cost the South African economy between R204 million and R899 million a day.¹⁵

A survey of 3 984 small business owners in 2019 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 or revenue during due to load shedding period¹⁶.

Benefits associated with REIPPPP

Through the competitive bidding process, the IPPPP has 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 R0.94/kWh, while solar PV has dropped with 75% to R1.14/kWh between BW1 and BW4.

Prices contracted under the REIPPPP for all technologies are well below the published REFIT prices. The REIPPPP has effectively translated policy and planning into delivery of clean energy at very competitive prices. As such it is contributing to the national aspirations of secure, affordable energy, lower carbon intensity and a transformed 'green' economy.

Table 4.8: Improve energy security and support renewable sector

Nature Development of infrastructure to generate renewable energy		
	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:		
<ul style="list-style-type: none"> • Maximise opportunities for local content and procurement. • Maximise employment opportunities for local community members. • Implement training and skills development programs for members from the local community. 		

¹⁴ <https://www.citizen.co.za/news/load-shedding-cost-economy-billion/>

¹⁵ <https://businesstech.co.za/news/energy/662515/stage-6-load-shedding-costs-south-africa-r900-million-a-day-sarb/>

¹⁶ "How does load shedding affect small business in SA?". The Yoco Small Business Pulse (3: Q1 2019):

Residual impacts: Overall reduction in CO₂ 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.

4.4.2 Creation of employment and business opportunities

The proposed development will create ~ 8 full-time employment opportunities during the operational phase that will be available to the local community. The annual operating budget will be in the region of R 20 million (2023 Rand values), including wages. A percentage of the annual operating budget will be spent in the local economy which will benefit local businesses.

Table 4.9: Assessment of employment 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)	Low (2)
Reversibility	N/A	N/A
Probability	Low Probability (2)	Highly Probable (4)
Significance	Low (14)	Moderate (32)
Status	Positive	Positive
Can impact be enhanced?	Yes	
<p>Enhancement:</p> <ul style="list-style-type: none"> • Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. • Where feasible, efforts should be made to employ local service providers that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. • The local authorities, community representatives, and organisations on the interested and affected party database should be informed of potential job opportunities for locals and the employment procedures for operational phase. • A training and skills development programmes for locals should be initiated as part of the operational phase. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. <p>Business</p> <ul style="list-style-type: none"> • The proponent should liaise with the LM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers. <p>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</p>		

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

Assessment of No-Go option

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

4.4.3 Generate income for affected landowners

The proponent will enter into rental agreements with the affected landowners for the use of the land for the establishment of the proposed projects. In terms of the rental agreement the affected landowners will be paid an annual amount dependent upon the number of wind turbines located on the property. The additional income will reduce the risk to his livelihoods posed by droughts and fluctuating market prices for livestock, crops, and farming inputs, such as fuel, feed etc. Given the risks posed by climate change the additional income represents a significant benefit for the affected landowner.

Table 4.10: Assessment of benefits associated with income generated for the 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:		
<ul style="list-style-type: none"> • Implement agreements with affected landowners. • The loss of high-quality agricultural land should be avoided and or minimised. The recommendations of the agricultural / soil assessment should be implemented. 		
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.

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 20-25 year project operational life. For the current portfolio of projects, the average commitment level is 2%, which is 101% higher than the minimum threshold level. To date (across BW1-4) a total contribution of R22.8 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.1 billion. Of the total commitment, R18.5 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–BW4), 85 are operational. The SED contributions associated with these 85 projects has amounted to R 1.8 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 1 388 education institutions with a total of R437 million in contributions, from 2015 to the end of June 2021. A total of 1 276 bursaries, amounting to R210.8 million, have been awarded by 67 IPPs from 2015 until the end of June 2021. The largest portion of the bursaries were awarded to African and Coloured students (97.4%), with women and girls receiving 56.3% of total bursaries. The Northern Cape province benefitted most from the bursaries awarded, with 57.2%, followed by the Eastern Cape (20.2%) and Western Cape (14.1%). 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 SED opportunities do therefore create significant benefits for local rural communities. However, SED investments can also be mismanaged. This is an issue that will need to be addressed when identifying and setting up SED projects.

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

Nature: Benefits associated with support for local community's form SED contributions
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	Without Mitigation	With Enhancement¹⁷
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	
<p>Enhancement:</p> <ul style="list-style-type: none"> • The proponents should liaise with the MCLM 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. 		
<p>Residual impacts: Promotion of social and economic development and improvement in the overall well-being of the community</p>		

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.

4.4.5 Visual impact and impact on sense of place

The proposed development has the potential to impact on the area's existing rural sense of place. Based on the findings of the Visual Impact Assessment (VIA)(SLR, 2023), the significance of the visual impact on sense of place was rated as Moderate Negative. The VIA notes that the N12 National Route and the R500 and R501 main roads could be considered as potentially sensitive receptor roads. However, the visual impacts of the proposed development on motorists would be reduced by the level of transformation and landscape degradation, especially to the north of the WEF project area. The VIA also notes that the proposed WEF comprises only ten wind turbines and it is anticipated that this factor would further reduce the visual impacts experienced by the identified receptors.

In terms of nighttime impacts linked to the civil aviation lights, the findings of the VIA indicate that the overall visual character of the night environment within the study area is considered to be moderately 'polluted' and will therefore not be regarded as pristine. While the operational and security lighting required for the proposed WEF project is likely to intrude on the nightscape and create some glare, the impact of the additional lighting is expected to be reduced by the presence of a significant amount of light already present within the surrounding area at night. However, farmsteads located in areas characterised by lower levels of disturbance / transformation would be moderately sensitive to the

¹⁷ Enhancement assumes effective management of the SED projects.

impact of additional lighting. In conclusion the VIA states that potential visual impacts associated with the proposed Igolide WEF are negative and of Moderate Significance. Given the absence of sensitive receptors and the significant level of human transformation and landscape degradation in areas near the proposed Igolide WEF, the project is deemed acceptable from a visual perspective and the EA should be granted. The VIA also indicates that the impacts associated with the construction, operation and decommissioning phases can be mitigated to acceptable levels provided the recommended mitigation measures are implemented.

The owners of the affected property indicated that the turbine locations were acceptable. Impact on sense of place was not raised as concern.

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	Medium (3)	Medium (3)
Reversibility	Reversible with rehabilitation (3)	Reversible with rehabilitation (3)
Probability	Probability (3)	Probability (3)
Significance	Moderate (36)	Moderate (36)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation The recommendations contained in the VIA should be implemented		
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.

4.4.6 Potential impact on property values and operations

The potential visual impacts associated with the proposed WEF have the potential to impact on property values. Based on the results of a literature review undertaken for other REFs the potential impact on property values in rural areas is likely to be limited. A study undertaken in Australia in 2016 (Urbis Pty Ltd) found that:

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

In terms of farming activities, the owners of the property indicated that the location of the substation and BESS was not unacceptable. This is linked to impact on hunting activities and security. The substation/BESS site is located 140 m north-east of

construction terrain Alternative 2. A 400 kV Eskom line is located 1.1. km to the east. The immediate context is of undisturbed veld. The concerns raised regarding the construction terrain Alternative 2 also apply the substation and BESS. The owners indicated that a site that is located on the periphery of the property would prefer a more peripheral location. The owners have proposed an alternative location on the northernmost site property, Leeuwpoot 356/65. This has been discussed with the developers.

Turbine locations are deemed unproblematic by the owners. The footprints are deemed sufficiently small not to affect game movements, and hunting exclusions (limiting shooting in certain directions) are deemed manageable.

Table 4.13: 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	
Mitigation The recommendations contained in the VIA should be implemented		
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.

4.4.7 Potential impact on tourism

The potential visual impacts associated with the proposed WEF have the potential to impact on tourism facilities and tourism in the area. Based on the findings of the literature review there is limited evidence to suggest that the proposed WEF would impact on the tourism in the area at both a local and regional level.

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	
Mitigation The recommendations contained in the VIA should be implemented		
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.

4.5 ASSESSMENT OF DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 - 25 years post commissioning. The decommissioning phase is therefore likely to create additional construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Given the relatively small number of people employed during the operational phase (~ 8), the social impacts at a community level associated with decommissioning will be limited. In addition, potential impacts associated with the decommissioning phase can be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative). Decommissioning will also create temporary employment opportunities, which would represent a positive temporary impact. The significance would be Low with enhancement due to limited opportunities and short duration.

Table 4.16: Social impacts associated with decommissioning

Nature: Social impacts associated with retrenchment including loss of jobs, and source of income. Decommissioning will also create temporary employment opportunities, which would represent a positive temporary impact		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Very Low (1)
Reversibility	N/A	N/A
Probability	Probability (3)	Probability (3)
Significance	Low (18)	Moderate (15)
Status	Negative	Negative
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • The proponent should ensure that retrenchment packages are provided for all staff retrenched when the plant is decommissioned. • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning. • Revenue generated from the sale of scrap metal during decommissioning should be allocated to funding closure and rehabilitation of disturbed areas. 		
Residual impacts: Loss of income and work opportunities.		

Assessment of No-Go option

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

4.6 CUMULATIVE IMPACT ON SENSE OF PLACE¹⁸

The potential cumulative impacts on the area’s sense of place will be largely linked to potential visual impacts. In this regard the Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. 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

¹⁸ The final grid route has not been determined, The cumulative assessment does not therefore include the grid component.

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 findings of the VIA (SLR, 2023) indicated that the South African Renewable Energy EIA Application Database from DFFE (REEA_OR_2023_Q1) records only one approved renewable energy project within 30kms of the Igolide WEF project area, namely a 200MW Solar Photovoltaic (PV) facility located adjacent to Sibanye Gold Mine. This project is however located 6.5 km north-east of the Igolide WEF project area, in close proximity to extensive, well-established mining developments and as such it is not anticipated that this development will result in any significant cumulative impacts affecting the landscape or the visual receptors within the visual assessment zone for the Igolide WEF. The VIA also notes that existing mining / quarrying and associated industrial development have already resulted in large scale visual impacts, especially to the north and east of the Igolide WEF project area. These developments have significantly altered the sense of place and visual character in the broader region. From a visual perspective, the concentration of renewable energy facilities in close proximity to existing mining development as proposed will further change the visual character of the area on the periphery of Fochville and alter the inherent sense of place, extending an increasingly industrial character into the broader area, and resulting in significant cumulative impacts. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommended mitigation measures.

Table 4.17: Cumulative impacts on sense of place and the landscape

Nature: Visual impacts associated with the establishment of more than one WEF 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	Probability (3)	Probable (3)
Significance	Moderate (36)	Moderate (36)
Status (positive/negative)	Negative	Negative
Can impacts be mitigated?	Limited potential	
Mitigation The recommendations contained in the VIA should be implemented		

Assessment of No-Go option

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

4.7 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The establishment of a number of REFs has the potential to place pressure on local services and accommodation, specifically during the construction phase. The objective will be to source as many low and semi-skilled workers for the construction phase from the MCLM, specifically Fochville and Charltonville. This will reduce the potential pressure on local services and accommodation in Fochville and Charltonville. In addition, due to the size of the town of Fochville and Charltonville the potential impact on local services is likely to be limited.

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 other potential renewable energy projects in the MCLM. These benefits will create opportunities for investment in the MCLM, including the opportunity to up-grade and expand existing services and the construction of new houses.

Table 4.18: 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 MCLM, 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: The proponent should liaise with the MCLM to address potential impacts on local services.		

Assessment of No-Go option

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

4.8 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 MCLM. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities.

The review of the REIPPPP (December 2021) indicates that to date (across BW1-4) a total contribution of R22.8 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.1 billion. Of the total commitment, R18.5 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.

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 4.19: 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 MCLM, 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: The proponent should liaise with the MCLM to identify potential opportunities for the local economy and businesses.		

Assessment of No-Go option

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

4.9 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 4.20: Assessment of no-development option

Nature: No-development option would result in the lost opportunity for South Africa to improve energy security and reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		
	Without Mitigation¹⁹	With Enhancement²⁰
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: The proposed WEF should be developed, and the mitigation and enhancement measures identified in the SIA and other specialist studies should be implemented.		
Residual impacts: Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change.		

¹⁹ Assumes project is not developed.

²⁰ Assumes project is developed.

SECTION 5: SUMMARY OF KEY FINDINGS

5.1 INTRODUCTION

Section 5 lists the key findings of the study. 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.

5.2.1 Policy and planning issues

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 at a provincial and local level. The development of the proposed WEF is therefore supported by key policy and planning documents.

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.

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	Moderate (Positive)	Moderate (Positive)
Presence of construction workers and potential impacts on family structures and social networks	Low (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	Moderate (Negative)	Low (Negative)
Increased risk of grass fires	Moderate (Negative)	Low (Negative)
Impact of heavy vehicles and construction activities	Moderate (Negative)	Low (Negative)
Loss of farmland	Moderate (Negative)	Low (Negative)

5.2.3 Operational phase impacts

The key social issues associated with the operational phase include:

Potential positive impacts

- Generate renewable energy.
- Creation of employment opportunities.
- Benefits associated with establishment of community trust.
- Benefits for local landowners.

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, except for the visual impact on sense of place, will be **Low Negative**. Most of 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
Generate renewable energy	Moderate (Positive)	High (Positive)
Creation of employment and business opportunities	Low (Positive)	Moderate (Positive)
Benefit associated with community trust	Moderate (Positive)	High (Positive)
Benefits for landowners	Low (Positive)	Moderate (Positive)
Visual impact and impact on sense of place	Moderate (Negative)	Moderate (Negative)
Impact on property values	Low (Negative)	Low (Negative)
Impact on tourism	Low (Negative)	Low (Negative)

5.2.4 Assessment of cumulative impacts²¹

Cumulative impact on sense of place

The establishment of the proposed WEF and other renewable energy facilities in the area will create the potential for combined and sequential visibility impacts. However, the impact on the area’s sense of place should be viewed within the context of the impact of the existing mining operations on the area’s sense of place. The potential visual impact on the area’s sense place is therefore likely to be **Moderate Negative**.

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 Decommissioning phase

Given the relatively small number of people employed during the operational phase (~ 8), the potential negative social impact on the local economy associated with decommissioning will be limited. In addition, the potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme. With mitigation, the impacts are assessed to be Low (negative). Decommissioning will also create temporary employment opportunities. The significance was assessed to be Low (positive).

5.2.6 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to generate renewable energy. This would represent a significant negative social cost.

²¹ The final grid route has not been determined, The cumulative assessment does not therefore include the grid component.

5.3 CONCLUSION AND RECOMMENDATIONS

Conclusion

The findings of the SIA indicate that the proposed Igolide WEF will result in several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phases. 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 most of the potential negative impacts associated with both the construction and operational phases are likely to be **Minor Negative** with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented.

Recommendations

- The developers should liaise with the owners of the property to identify a preferred location for the construction camp clusters.
- The developers should liaise with the owners of the property to identify a preferred location for the substation and BESS.

Statement and reasoned opinion

The establishment of the proposed Igolide WEF and associated infrastructure is supported by the findings of the SIA. The recommendations listed above should however be addressed.

ANNEXURE A

REFERENCES

- The National Energy Act (2008).
- The White Paper on Renewable Energy (November 2003).
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- The National Development Plan (2011).
- The New Growth Path Framework (2010).
- National Infrastructure Plan (2021).
- Gauteng Provincial Employment, Growth and Development Strategy
- Gauteng Provincial Spatial Development Framework 2030
- Gauteng Integrated Energy Strategy (2012)
- Growing Gauteng Together 2030
- Merafong City Local Municipality Integrated Development Plan (2020)
- Merafong City Local Municipality Spatial Development Framework (2019)
- Visual Impact Assessment Igolide WEF. SLR (2023)

ANNEXURE B: ASSESSMENT METHODOLOGY

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 direct²², indirect²³, secondary²⁴ as well as cumulative²⁵ 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 criteria²⁶ 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

²² Impacts that arise directly from activities that form an integral part of the Project.

²³ Impacts that arise indirectly from activities not explicitly forming part of the Project.

²⁴ Secondary or induced impacts caused by a change in the Project environment.

²⁵ Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

²⁶ 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: CV

Tony Barbour

ENVIRONMENTAL CONSULTING

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

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

EDUCATION

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

EMPLOYMENT RECORD

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

LECTURING

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

RELEVANT EXPERIENCE AND EXPERTISE

Tony Barbour has undertaken in the region of 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: DECLARATION OF INDEPENDENCE

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;

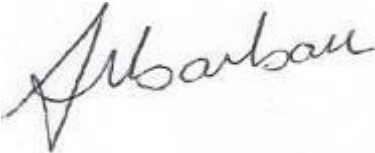
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;

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):

15 June 2023

Date: