

SOCIAL IMPACT ASSESSMENT

KHOE WIND ENERGY FACILITY

WESTERN CAPE PROVINCE

AUGUST 2024

Prepared

by

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EXECUTIVE SUMMARY

INTRODUCTION AND LOCATION

ERM was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed up to 290 MW Khoe Wind Energy Facility (WEF) located ~ 30 north west of Montagu in the Langeberg Municipality in the Western Cape Province. Tony Barbour Environmental Consulting was appointed to undertake a specialist Social Impact Assessment (SIA) as part of an EIA process.

SUMMARY OF KEY FINDINGS

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

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

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.

However, the Western Cape Provincial Spatial Development Framework (WCPSDF) highlights the importance of the Province's landscape and scenic assets, noting that they underpin the tourism economy. The WCPSDF identifies the mountain ranges belonging to the Cape Fold Belt together with the coastline as the most significant in scenic terms and underpin the WCP's tourism economy and notes that several scenic landscapes of high significance are under threat, including landscapes under pressure for large scale infrastructural developments such as **wind farms**. The Langeberg Spatial Development Framework also identifies the R318 as scenic route highlights the importance of:

- Preserving the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promoting and protecting the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promoting tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

The development of large-scale wind farms in the area to the south of the N1 may therefore not be ideal, specifically given the scenic and environmental qualities of the area.

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.

The construction phase will extend over a period of approximately 18-24 months and create in the region of 200-250 employment opportunities. Members from the local communities in Ermelo and the LM would qualify for some of the low skilled and semi-skilled employment opportunities and a number of skilled opportunities. The Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members from the local community. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a social benefit. The total wage bill will be in the region of R 25 million (2024 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 LM and BVM. The capital expenditure associated with the construction phase will be approximately R 8 billion (2024 Rand value). However, given the technical nature of the project most benefits will accrue to companies based in the Cape Metro. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers.

Potential negative impacts

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

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

Table 1: Summary of social impacts during construction phase

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

OPERATIONAL PHASE

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

Potential positive impacts

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

The proposed project will supplement South Africa’s energy and assist to improve energy security. In addition, it will also reduce the country’s reliance on coal as an energy source. This represents a positive social benefit. However, it should be noted that the benefits are not site dependent.

Potential negative impacts

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

Concerns relating the potential visual impact of the proposed Khoe WEF on local properties and tourist related activities were raised by several affected property owners. The overall finding of the VIA (Logis July 2024) indicate that the proposed Khoe WEF will have a **Very High** visual impact on areas sense of place. Based on this finding the author of the VIA is of the opinion that the visual impacts associated with the proposed Khoe WEF exceeded acceptable limits and is considered fatally flawed from a visual perspective. The development of the Khoe WEF is therefore not supported by the VIA.

The findings of the SIA support the findings of the VIA. Based on the findings of the SIA the significance of the visual impact associated with the Khoe WEF was rated as **High Negative** with and without mitigation.

The significance of the impacts associated with the operational phase are summarised in Table 2.

Table 2: Summary of social impacts during operational phase

Impact	Significance No Mitigation/Enhancement	Significance With Mitigation/Enhancement
Establishment of infrastructure to improve energy security and support renewable sector	Medium (Positive)	High (Positive)
Creation of employment and business opportunities	Low (Positive)	Medium (Positive)
Generate income for local landowners	Low (Positive)	Medium (Positive)
Benefits associated with socio-economic contributions to community development	Medium (Positive)	High (Positive)
Visual impact on sense of place (VIA)	Very High (Negative)	Very High (Negative)
Visual impact and impact on sense of place (SIA)	High (Negative)	High (Negative)
Impact on property values of visually affected properties	Medium (Negative)	Low (Negative) ¹
Impact on tourism (affected properties)	Medium (Negative)	Low (Negative) ²
Impact on tourism: Region	Low (Negative)	Low (Negative)

CUMULATIVE IMPACTS

Cumulative impact on sense of place

The potential visual impact of the proposed WEF and associated infrastructure on the areas sense of place is likely to **Very High Negative**.

Cumulative impact on local services and accommodation

The significance of this impact with mitigation was rated as **Low Negative**.

Cumulative impact on local economy

The significance of this impact with enhancement was rated as **Medium-High Positive**.

¹ Assumes affected property owners are fully compensated to their satisfaction for impact on property values.

² Assumes affected property owners are fully compensated to their satisfaction for impact on tourism operations.

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 was assessed to be Low (positive).

NO-DEVELOPMENT OPTION

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with 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. However, the benefits associated with the WEF are not site dependent and would also be associated with an alternative site.

CONCLUSION

The findings of the SIA indicate that proposed Khoe WEF project will create several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy that will improve energy security in South Africa and contribute towards reducing the countries carbon footprint. However, the benefits associated with the WEF are not site dependent and would also be associated with an alternative site.

Based on the findings of the VIA (MetroGIS) the Khoe WEF will have a **Very High Negative** Impact on the areas sense of place. The cumulative impacts on the area's sense of place will also be **Very High Negative**. Effective mitigation is not possible. Based on this finding the visual impacts associated with the proposed Khoe WEF exceed acceptable limits and are considered as a fatal flaw from a visual perspective. The development of the Khoe WEF is therefore not supported by the VIA. The findings of the SIA support the findings of the VIA. Given the areas visual sensitivity and number of established nature reserves and associated eco-tourism facilities, the Khoe WEF is located in an area that is not regarded as suitable for the establishment of a large-scale wind energy facility.

Statement and reasoned opinion

Based on the findings of the SIA the development of the proposed Khoe WEF is not supported. The suitability of establishing large WEFs, including the proposed Khoe WEF, in the area to the south of the N1 is questioned. The development of renewable energy facilities in the area to the south of the N1 represents a spillover from the Komsberg REDZ located to the north of the N1. From a long-term planning perspective this is regarded as ideal, specifically given the environmental and scenic qualities of the area. In this regard the Western Cape Provincial Spatial Development Framework highlights the importance to the Province's landscape and scenic assets and threat posed by large scale infrastructural developments such as wind farms. The Langeberg Spatial Development Framework also identifies the R318 as scenic route and highlights the importance of:

- Preserving the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promoting and protecting the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promoting tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

It is also important to note that the benefits associated with the Khoe WEF are not site dependent and would also be associated with an alternative site. This point is relevant given the environmental and social sensitivity of the study area.

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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 A
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.6, Annexure B
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3,
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Interviews in 2021 (Annexure A)
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.2, Annexure B
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4, Section 5,
(g) an identification of any areas to be avoided, including buffers;	Section 4
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.4,
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 4, Section 5
(k) any mitigation measures for inclusion in the EMPr;	Section 4
(l) any conditions for inclusion in the environmental authorisation;	Section 4, Section 5
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion— i. as to whether the proposed activity, activities or portions thereof should be authorised; iA. Regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr or Environmental Authorization, and where applicable, the closure plan;	Section 5.3
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report	Annexure A, lists key stakeholders interviewed
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Annexure A, lists key stakeholders interviewed
(q) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a	Comply with the Assessment Protocols that were

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

BESS	Battery Energy Storage System
CWDM	Cape Winelands District Municipality
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	Langeberg Municipality
MW	Megawatt
SDF	Spatial Development Framework
SIA	Social Impact Assessment
VIA	Visual Impact Assessment
WCP	Western Cape Province
WEF	Wind Energy Facility

SECTION 1: INTRODUCTION

1.1 INTRODUCTION

ERM was appointed to manage the Environmental Impact Assessment (EIA) process for the proposed up to 290 MW Khoe Wind Energy Facility (WEF) located ~ 30 north west of Montagu in the Langeberg Municipality (LM) in the Western Cape Province (Figure 1.1).

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

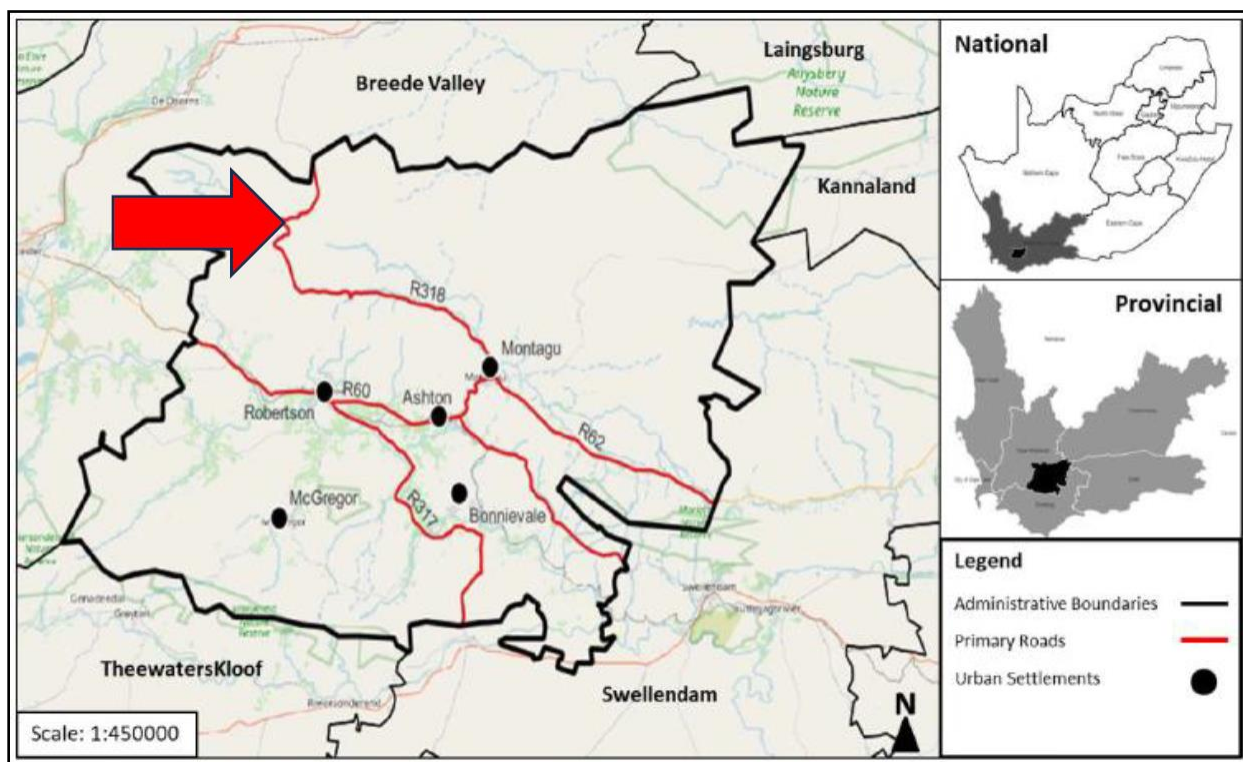


Figure 1.1: Location of Khoe WEF site (red arrow)

1.2 PROJECT DESCRIPTION

The proposed Khoe WEF will comprise up to 29 turbines with a maximum output capacity of up to 290 MW with an anticipated lifespan of 20-25 years. The WEF will be located on the following land parcels: 1/38; 2/38; 11/38; 193; and RE/37 (Table 1.1). The final design which will be requested for approval in the EA, will be determined based on the outcome of the specialist studies undertaken for the EIA phase of the development. The proposed turbine footprint and associated facility infrastructure will cover an area of up to 4113 ha, depending on the final design.

It is proposed that an on-site substation with a capacity up 132 kV with an up to 33 kV overhead / underground powerline will be installed. It is unknown at this stage how long the connection to the grid will be, or what route the cabling will be installed. Table 1.2 provides a summary of the technical details of the proposed WEF.

Table 1.1: Landowners details Khoe WEF

Landowner	Farm Name	Farm No.	Portion No.
Sandvlei Trust	Eendragt	38	1
Hennie De Kock	Eendragt	38	2
Hennie De Kock	Eendragt	38	11
Johan Le Roux	Plaas 193	193	
Sophia Le Roux	Eendragt	37	RE
Overhead Transmission Line			
Hennie De Kock	Eendragt	38	11
Johan Le Roux	Plaas 193	193	9

Table 1.2: Technical details of Khoe WEF

Maximum Generation Capacity	up to 290MW
Type of technology	Onshore Wind
Number of Turbines (Photograph 1.1)	Up to 29 (Photograph 1.1)
WTG Hub Height from ground level	up to 150m
Blade Length	up to 100m
Rotor Diameter	up to 200m
Structure height (Tip Height)	up to 250m
Structure orientation	Wind regiment dependent
Operations and maintenance buildings (O&M building) with parking area	up to 1 HA
Site Access	Via the R318
Area occupied by inverter transformer stations/substations	up to 2.5 HA

Capacity of on-site substation	132/33kv
Battery Energy Storage System footprint (Photograph 1.2)	up to 5 HA
BESS type	Lithium-ion or Redox-flow technology, depending on the most feasible at the time of implementation
BESS Alternatives (site, technology, design and layout)	Same as above. See layout for design and position
Length of internal roads	TBD
Width of internal roads	Access roads to the site and between project components with a width of approximately 4.5 m and a servitude of 13.5 m.
Proximity to grid connection	TBD
Internal Cabling	Cabling between the turbines, to be laid underground where practical.
Height of fencing	TBD
Type of fencing	TBD
Water supply, volumes required	±24500m ³ for the construction, commissioning and test phase (±26 months), the majority being consumed during year-one of the construction. ±90m ³ /annum for the life-of-WEF (20-25 years)



Photograph 1.1: Typical example of wind turbine



Photograph 1.2: Example of BESS located in storage containers

1.3 APPROACH TO STUDY

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.

1.4 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 WEF and associated infrastructure.

Strategic importance of the project

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

Fit with planning and policy requirements

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

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

1.4.2 Limitations

There are no limitations that have a material bearing on the SIA.

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 350 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 20 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 fit³” 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:

- National Energy Act (2008).
- White Paper on the Energy Policy of the Republic of South Africa (December 1998).
- White Paper on Renewable Energy (November 2003).
- Integrated Energy Plan (2016).
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- National Development Plan (2011).
- New Growth Path Framework.
- National Infrastructure Plan.
- Western Cape Provincial Spatial Development Framework (2014).
- Western Cape Infrastructure Framework (2013).
- Western Cape Provincial Strategic Plan (2014).
- Western Cape Green Economy Strategy (2013).
- One Cape 2040 (2012)
- Langeberg Municipality Spatial Development Framework (2023).
- Langeberg Integrated Development Plan (IDP) (2022-2027).

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).

³ Planning fit” can simply be described as the extent to which any relevant development satisfies the core criteria of appropriateness, need, and desirability, as defined or circumscribed by the relevant applicable legislation and policy documents at a given time.

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

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

“Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential”.

“Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future”.

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

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

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

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

2.2.3 White Paper on Renewable Energy

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

The White Paper notes that while South Africa is well endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. As signatory to the Kyoto Protocol⁴, Government is determined to make good the country’s commitment to reducing greenhouse gas emissions.

⁴ 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).

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

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

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

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

2.2.4 Integrated 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).

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, 4800MW of Medupi, 4800MW 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	-1,403				300	818			
2022	711	-844			513	400	1,000	1,600		
2023	750	-555				1,000	1,600		500	
2024			1,860				1,600	1,000	500	
2025						1,000	1,600		500	
2026		-1,219					1,600		500	
2027	750	-847					1,600	2,000	500	
2028		-475				1,000	1,600		500	
2029		-1,694			1,575	1,000	1,600		500	
2030		-1,050		2,500		1,000	1,600		500	
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

<ul style="list-style-type: none"> Installed Capacity Committed/Already Contracted Capacity Capacity Decommissioned New Additional Capacity Extension of Koeberg Plant Design Life Includes Distributed Generation Capacity for own use 	<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.
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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 000MW 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.

2.2.5 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.

2.2.6 The New Growth Path Framework

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

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

2.2.7 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 to support investments 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 2021⁵. The first phase of the NIP 2050 focuses on four critical network sectors that provide a platform, namely, energy,

⁵ Gazette No. 44951

freight transport, water, and digital infrastructure. In line with the NDP, the vision for the energy sector is to promote:

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

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

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

2.3 PROVINCIAL AND LOCAL LEVEL POLICY AND PLANNING

2.3.1 Western Cape Provincial Spatial Development Framework (2014)

The Western Cape Provincial Spatial Development Framework (PSDF) (2014) is based on a set of 5 guiding principles, namely:

- Spatial justice.
- Sustainability and resilience.
- Spatial efficiency.
- Accessibility.
- Quality and Livability.

Under Sustainability and Resilience, the PSDF notes that land development should be spatially compact, resource-frugal, compatible with cultural and scenic landscapes, and should not involve the conversion of high potential agricultural land or compromise ecosystems (p. 22).

Key spatial challenges are outlined in Chapter 2 of the PSDF. Energy security and climate change response are identified as key high-level future risk factors. The PSDF notes that the WCP is subject to global environmental risks such as climate change, depletion of material resources, anticipated changes to the global carbon regulatory environment, and food and

water insecurity. The challenge would be to open up opportunities for inclusive economic growth, and decouple economic growth from resource consumptive activities (i.e. the development of a 'greener' economy, as outlined in the 2013 WCP Green is Smart strategy – see further below).

In this regard, the 2014 PSDF is in response to a number of associated escalating risks, including understanding the spatial implications of known risks (e.g., climate change and its economic impact and sea level rise, flooding and wind damage associated with extreme climatic events); and energy insecurity, high levels of carbon emissions, and the economic impacts of the introduction of a carbon tax (p. 27).

The spatial agenda for the WCP is set out in Chapter 2.6. This agenda is anticipated to deliver on the objectives of greater inclusivity, growth and environmental resilience. The agenda may be summarized as three linked sub-agendas, all addressed in the PSDF:

- (1) Growing the WCP economy in partnership with the private sector, non-governmental and community-based organisations.
- (2) Using infrastructure investment as primary lever to bring about the required urban and rural spatial transitions, including transitioning to sustainable technologies, as set out in the 2013 Western Cape Infrastructure Framework (WCIF), while also maintaining existing infrastructure.
- (3.) Improving oversight of the sustainable use of the Western Cape's spatial assets. This sub-agendum is of specific relevance to climate change response and renewable energy. Its key objective is safeguarding the biodiversity networks, ecosystem services, agricultural resources, soils, and water, as well as the WCP's unique cultural, scenic and coastal resources on which the tourism economy depends. In addition, it seeks to understand the spatial implications of known risks (e.g. climate change) and to introduce risk mitigation and/or adaptation measures.

Chapter 3.1 deals with the sustainable use of the WCP's assets. These are identified as biodiversity and ecosystem services; water resources; soils and mineral resources; resource consumption and disposal; and landscape and scenic assets. Policies are outlined for each of these themed assets. The last two themed assets are of specific relevance with regard to renewable energy.

Key challenges facing the WCP are identified as matters pertaining to waste disposal, air quality, energy, and climate change.

Energy

With regard to energy use, the PSDF notes that the Cape Metro (albeit the province's most efficient user) and West Coast regions are the WCP's main energy users. It further notes that the WCP's electricity is primarily drawn from the national grid, which is dominated by coal-based power stations, and that the WCP currently has a small emergent renewable energy sector in the form of wind and solar generation facilities located in its more rural, sparsely populated areas. The PSDF also reiterates PGWC's commitment to shifting the economy towards gas⁶ as transitional fuel (see WCIP below). Most of the energy discussion in the PSDF is dominated by aspects pertaining to natural gas. Regarding renewable energy, the following policy provisions are of relevance:

⁶ The PSDF at present envisages mainly from offshore West Coast gas fields via a terminal at Saldanha. The PSDF refers to the potential exploitation of own shale reserves, but also to the environmental sensitivity involved.

- Policy R.4.6: *Pursue energy diversification and energy efficiency in order for the Western Cape to transition to a low carbon, sustainable energy future, and delink economic growth from energy use.*
- R.4.7: *Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste conversion initiatives) in suitable rural locations (as per recommendations of the Strategic Environmental Assessments for wind energy (DEA&DP) and renewable energy (DEA)).*

Climate change

Water scarcity is identified as probably the key risk associated with climate change. Essentially the same primary response objectives outlined in the 2014 Western Cape Climate Change Response Strategy are identified in the PSDF. These are energy efficiency, demand management and renewable energy. Policy provisions are made with regard to climate change adaptation and mitigation. Concerning renewable energy, the following is of relevance:

- R.4.16: *Encourage and support renewable energy generation at scale.*

Landscape and scenic assets

A specialist study was undertaken into the Province's cultural and scenic landscapes. This study⁷ was one of the informants of the 2014 PSDF. It established that the WCP's cultural and scenic landscapes are significant assets underpinning the tourism economy, but that these resources are being incrementally eroded and fragmented. According to the study agriculture is being reduced to 'islands', visual cluttering of the landscape by non-agricultural development is prevalent, and rural authenticity, character and scenic value are being eroded. The mountain ranges belonging to the Cape Fold Belt together with the coastline are identified as the most significant in scenic terms and underpin the WCP's tourism economy.

A number of scenic landscapes of high significance are under threat, mainly from low density urban sprawl, and require strategies to ensure their long-term protection. These include landscapes under pressure for large scale infrastructural developments such as **wind farms**, solar energy facilities, transmission lines and shale gas development in the Central Karoo (p. 54). With regard to renewable energy, the following policy provisions are of relevance: R.5.6: Priority focus areas proposed for conservation or protection include -

- Rural landscapes of scenic and cultural significance situated on major urban edges and under increasing development pressure, e.g., Cape Winelands.
- Undeveloped coastal landscapes under major development pressure.
- Landscapes under pressure for large scale infrastructural developments such as **wind farms**, solar energy facilities, transmission lines and fracking, e.g., Central Karoo.
- Vulnerable historic mountain passes and 'poorts'.

2.3.2 Western Cape Infrastructure Plan

The Western Cape Infrastructure Framework (WCIF)(2013) was developed by the WCP Provincial Department of Transport and Public Works in terms of the Provincial Government's

⁷ DEA&DP Winter and Oberholzer (2013). *Heritage and Scenic Resources: Inventory and Policy Framework for the Western Cape. - A Study prepared for the Western Cape Provincial Spatial Development Framework. Draft 5.* See footnote 1 above.

mandate to coordinate provincial planning under Schedule 5A of the Constitution. The objective of the WCIF is to align the planning, delivery, and management of infrastructure to the strategic agenda and vision for the province, as outlined in the 2009-2014 Draft Provincial Strategic Plan. The One Cape 2040 and 2013 Green is Smart strategy were other key informants.

The document notes that given the status quo of infrastructure in the province, and the changing and uncertain world facing the Western Cape over the 2-3 decades a new approach to infrastructure is needed. Namely one that satisfies current needs and backlogs, maintains the existing infrastructure, and plans proactively for a desired future outcome. The 2040 vision requires a number of transitions to shift fundamentally the way in which infrastructure is provided and the type of infrastructure provided in WCP.

The WCIF addresses new infrastructure development under five major 'systems' (themes), and outlines priorities for each. Energy is one of the 'systems' identified. The document notes that a provincial demand increase of 3% per year is anticipated for the period 2012-2040. Key priorities are in matching energy generation/ sourcing with the demand needed for WCP economic growth. Additionally, the energy focus should be on lowering the provincial carbon footprint, with an emphasis on renewable and locally generated energy.

Three key transitions are identified for the WCP Energy 'system' infrastructure, namely:

- Shifting transport patterns to reduce reliance on liquid fuels.
- Promoting natural gas as a transition fuel by introducing gas processing and transport infrastructure.
- Promoting the development of renewable energy plants in the province and associated manufacturing capacity.

2.3.3 Western Cape Green Economy Strategy Framework

The Western Cape Green Economy Strategy (2013) – 'Green is Smart' - is a framework for shifting the Western Cape economy from its current carbon intensive and resource-wasteful path within a context of high levels of poverty to one which is smarter, greener, more competitive, and more equitable and inclusive. The Strategy is closely aligned with provincial development goals and the 2014 WCCRS.

The Strategy's point of departure is that while the WCP faces significant challenges in terms of climate change and economic development. Two of the WCP's key economic sectors - both of national importance - agriculture and tourism, are vulnerable to climate change. At the same time, these challenges hold significant potential for opportunities linked to attracting investment, economic development, employment creation, and more resilient infrastructure and patterns of consumption. These opportunities are partly linked to the WCP's existing leadership in some fields of green technology, including knowledge services.

The core objective of the Strategy is to position the WCP as the lowest carbon footprint province in South Africa, and a leading green economy hub on the African continent.

The Strategy framework is made up of 5 drivers of the green economy which are market focused and principally private sector driven and supported by 5 enablers which are either public sector driven, or the product of a collaborative effort.

The five drivers are: smart mobility, smart living and working, smart ecosystems, smart agri-processing and smart enterprise. The relevant cross-cutting enablers are: finance, rules and regulations, knowledge management, capabilities, and infrastructure.

The framework also identifies priorities that would position the WCP as a pioneer and early adopter of green economic activity. These priorities have been identified in terms of the WCP being firstly, a front-runner or pioneer and secondly, an early adopter of innovations and technologies which already exist but are not widely adopted in South Africa. Some priorities are considered game-changers and are singled out as 'high level priorities for green growth'.

Three such 'high level priorities for green growth' are identified, two of which are of relevance here:

- **Natural Gas and Renewables:** Off-shore natural gas, potential gas baseload power plants and renewable energy IPP programme, together with a greenfield gas infrastructure, will be the game-changer for the Western Cape to be the lowest carbon province in South Africa, and achieve significant manufacturing investment.
- **Green Jobs:** A green growth path without job growth is unsustainable. There must be early pursuit of priorities with a high rate of job growth potential – notably rehabilitation of natural assets, responsible tourism and the waste sector.

'Under the section dealing with drivers, renewable energy is discussed under 'Smart Enterprise'. The WCP's objective in terms of this driver is to establish the WCP as a globally recognized centre of green living, working, creativity, business, and investment, and thereby attract investment, business and employment opportunities. Based on existing comparative advantages, three key opportunities are identified, one of which is of relevance here, namely, to establish the WCP as Africa's new energy servicing hub.

In this regard, the Strategy document notes that WCP is well placed to be the most important research and servicing hub for the renewable and natural gas energy sectors in South Africa and on the African continent. The Strategy also notes that there are important initial opportunities in the construction of new energy infrastructure. However, the real long-term benefits lie in the servicing of operational infrastructure. In this regard, it is estimated that the annual servicing and maintenance costs of WEFs for instance amount to approximately 10% of the initial capital investment.

Public and market sector procurement are identified as some of the key enablers. The creation of a streamlined regulatory system – the reduction of 'red tape' – is identified as a key prerequisite for creating an enabling environment.

Under the section dealing with enablers necessary to unlock development potential, renewable energy is discussed under "Smart Infrastructure". The Strategy document notes that existing infrastructure systems, particularly those relating to energy and transport, are carbon intensive, with high costs to the environment. Opportunities for the WCP are linked to tapping into infrastructural development funding by leveraging existing advantages.

With regard to the energy sector, the Strategy proposes that the WCP becomes an early adopter of natural gas processing and transport infrastructure and become the hub of Concentrated Solar manufacture and servicing. Natural gas is identified as the key potential 'game changer' of the WCP economy, and at present the best way to transition the economy to a more fully integrated renewables sector as major part of the WCP fuel mix in the long term. In this regard, the relative ease with which gas-fired stations could be activated make them an ideal supplement to less predictable wind and solar sources.

Surprisingly, WEF and Solar PV manufacture and servicing receive no specific mention, while Concentrated Solar (CSP) does. The Strategy document justly notes that while the Northern Cape Province is the best suited for CSP facilities, the WCP has strong existing research capabilities in CSP at the University of Stellenbosch (US), and the WCP's existing manufacturing sector already has the capacity to manufacture many CSP components.

Potential opportunities of commercialisation of CSP technology for local (RSA, Africa) conditions based on US research could be substantial. This subsector is identified as an important area of collaboration between the two provinces to realise the potential benefits (p 41). The key action at this stage to initiate a WCP manufacturing and servicing centre is to lobby for support for a pilot of South African designed CSP technologies, adapted to SA conditions (p. 43).

2.3.4 Western Cape Climate Change Response Strategy

The Western Cape Climate Change Response Strategy (WCCCRS) was adopted in February 2014. The strategy is an update of the 2008 Western Cape Climate Change Response Strategy and Action Plan. The key difference with the 2008 Strategy is a greater emphasis on mitigation, including strategically suitable renewable energy development.

The 2014 WCCCRS was updated in accordance with the National Climate Change Response Policy (2013) and is strongly aligned with the overarching provincial objectives contained in the Western Cape Draft Strategic Plan 2009-2014 (2010), and the WCP 'Green is Smart' Strategy (2013). In line with the National Climate Change Response Policy, the Strategy takes a two-pronged approach to addressing climate change:

- Mitigation: Contribute to national and global efforts to significantly reduce Green House Gas (GHG) emissions and build a sustainable low carbon economy, which simultaneously addresses the need for economic growth, job creation and improving socio-economic conditions.
- Adaptation: Reduce climate vulnerability and develop the adaptive capacity of the Western Cape's economy, its people, its ecosystems and its critical infrastructure in a manner that simultaneously addresses the province's socio-economic and environmental goals (WCCCRS, 2014: 21).

The Strategy will be executed through an implementation framework which will include an institutional framework for both internal and external stakeholders, with a strong emphasis on partnerships. The framework still has to be prepared. A monitoring and evaluation system is further envisaged in order to track the transition to a low carbon and climate resilient WCP. Policy aspects dealing with mitigation are of specific relevance to renewable energy generation.

Energy and emissions baseline

Based on comprehensive 2009 data for all WCP energy use sectors, the following key findings pertain to overall WCP energy use and emissions:

- Electricity is the key fuel used in the WCP, accounting for 25% of total consumption.
- Approximately 95% of base load electricity is generated from low-grade coal and the remainder by nuclear. The vast bulk of WCP electricity is generated in the north of the country.

- In terms of emissions by sector, electricity is responsible for 55% of total WCP emissions. According to the Strategy, this supports the case for a shift towards renewables and clean energy types.
- Transport (55%) was the greatest energy user, followed by industry (33%). Although domestic consumption accounted for only 8%, it accounted for 18% of emissions, again underscoring the emission-intensive nature of electricity generation.

Mitigation potential

According to the Strategy, the main opportunities for mitigation include energy efficiency, demand-side management, and moving towards a less-emission intensive energy mix.

In the short to medium term, four areas with mitigation potential are identified, including promoting renewable energy in the form of both small-scale embedded generation as well as large scale renewable energy facilities. Together with other mitigation interventions, renewable energy generation is anticipated to result in the following socio-economic benefits:

- Reducing fuel costs to households and business.
- Improving the competitiveness of businesses.
- Job creation opportunities with the development of new economic sectors.
- Local business development.
- Improved air quality (with positive health impacts).
- Reducing the negative impact of large carbon footprints, particularly for export products.
- Reducing stress on energy needs of the province and thereby increasing energy security.

Renewable energy as strategic focus area

Initial implementation of the Strategy will focus on select focus areas aligned with the National Climate Change Response Policy Flagship Programmes and the Western Cape Green Economy Strategy Framework. These focus areas will be reviewed every five years – i.e., the next revision is due in 2019. Renewable area is identified as one of nine focus areas. The Strategy document notes that renewable energy is a key area of focus for the Western Cape and forms a fundamental component of the drive towards the Western Cape becoming the green economy hub for Africa.

The role of provincial government is identified as 'supporting the development of the renewable energy industry through promoting the placement of renewable energy facilities in strategic areas of the Western Cape as well as through supporting renewable energy industries.

The document further notes that waste-to-energy opportunities are being investigated in order to facilitate large-scale rollout. Current investigation includes understanding the most appropriate technologies for waste-to-energy projects as well as developing decision support tools for municipalities to implement waste-to-energy programmes).

Priority areas identified for renewable energy development:

- Development of the Renewable Energy economy in the WCP, in terms of both the appropriate placement of renewable energy as well as manufacturing opportunities.
- Development of waste-to-energy opportunities for both municipal and private sector (commercial and industrial) waste systems.
- Development of opportunities around small-scale renewable energy embedded generation activities.

2.3.5 One Cape 2040 Strategy

The One Cape 2040 (2012) vision was developed by the Western Cape Government, the City of Cape Town (CoCT) and the Western Cape Economic Development Partnership. It was adopted as policy by CoCT Council in 2012. It is aimed at stimulating a transition towards a more inclusive and resilient WCP economy. It seeks to set a common direction to guide planning and action and to promote a common commitment and accountability to sustained long-term progress.

The 2040 Strategy does not replace any existing statutory plans. Rather, it is intended as a basic reference point and guide for all stakeholders planning for long-term economic resilience and inclusive growth.

Six key transitions are identified which to define the necessary infrastructure-related shifts in the WCP. One of these 6 key transitions is an Ecological transition ('Green Cape') from an unsustainable, carbon-intensive, resource use economy, to a sustainable, low carbon-footprint one. The development of renewable energy projects and natural gas are expected to significantly decrease the WCP's carbon footprint.

2.3.6 Langeberg Municipality Integrated Development Plan

The vision for the Langeberg Municipality (LM) as set out in the IDP is "to create a safe and healthy environment for delivering sustainable quality services". The mission statement that underpins the vision is "An efficient and cost-effective municipality for good governance, sustainable services, safe and secure environment, sound financial management and a conducive environment for local economic development".

The IDP lists five strategic objectives (SOs), namely:

- SO1: Ensure efficient administration for good governance.
- SO2: Provide infrastructure for sustainable and affordable basic services.
- SO3: Promote a safe and secure environment.
- SO4: Promote and facilitate investment and local economic development.
- SO5: Provide sustainable financial management.

SO2 and SO4 are the most relevant to the proposed development.

In terms of SO2 the IDP identifies the need for the LM to research alternative source of electricity to supply municipality. The IDP makes specific reference to the wastewater treatment plant, however, this would also apply to other facilities.

In terms of SO 4 the IDP refers to promoting economic development in the area and working with the private sector to promote economic growth and encourage investment and promote social development programmes within the municipal area. The IDP also identifies the need to support the growth and development of the tourism sector. The key challenges facing the LM include unemployment and poverty.

Of specific relevance the Energy Sector the IDP notes that the LM plans to embark on a process to procure energy from Independent Power Producers (IPP's) to reduce our reliance on Eskom as the sole supplier of energy. With the diminishing continuity of supply from Eskom, consumers are looking towards alternative energy to keep the lights on and industry operational. The Wheeling of energy is being investigated and it is proposed to implement a framework, policy, and tariff for wheeling in 2023/24. This will enable energy generators to transport (wheel) energy through the Municipal network to a consumer (or consumers) elsewhere in the Municipal grid.

The study area is located in Ward 12 of the LM (Figure 2.2). The key issues identified in Ward 12 that are relevant to the project and that could be supported by socio-economic contributions include:

- Provide safe recreation facilities – sports field in Ashbury.
- Build a community hall in Ashbury.
- Provide floodlights in dark areas.
- Provide youth projects.

- Provide a sports field in Baden/Koo.
- Build a community hall in Koo/Keisie.
- Provide a play park at Pietersfontein.

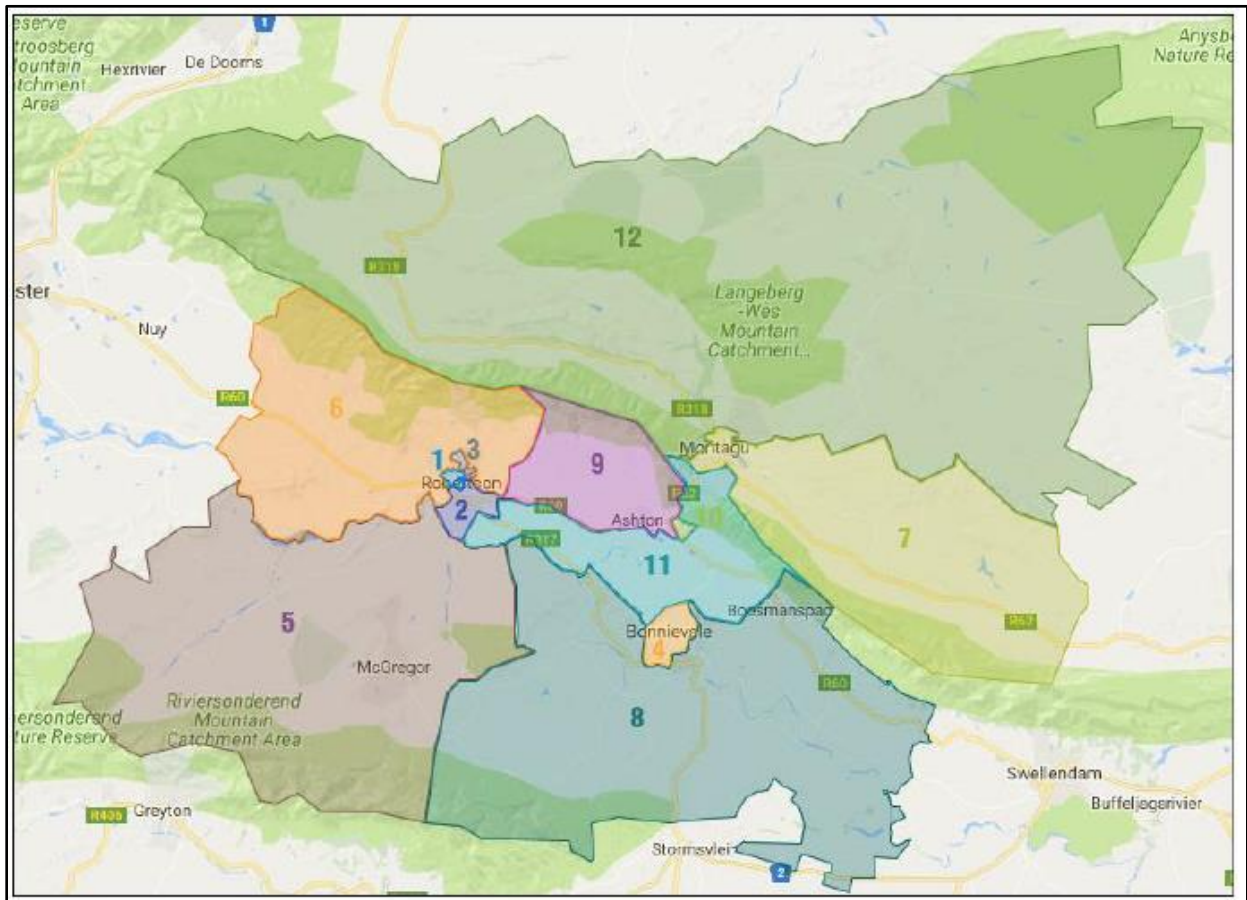


Figure 2.2: Location of Ward 12

The IDP refers to the SDF. However, reference is made to the 2013 SDF prepared by CNdV, and not the latest SDF (Aurecon, 2019). The maps from the 2013 SDF do however provide useful information on the study area. As indicated in Figure 2.3, 2.4 and 2.5, the study area does not appear to be located in a critical biodiversity area (CBA), catchment management area or cultivated area respectively. The land use guidelines for CBAs indicate that for all types of development, footprints should be minimised.

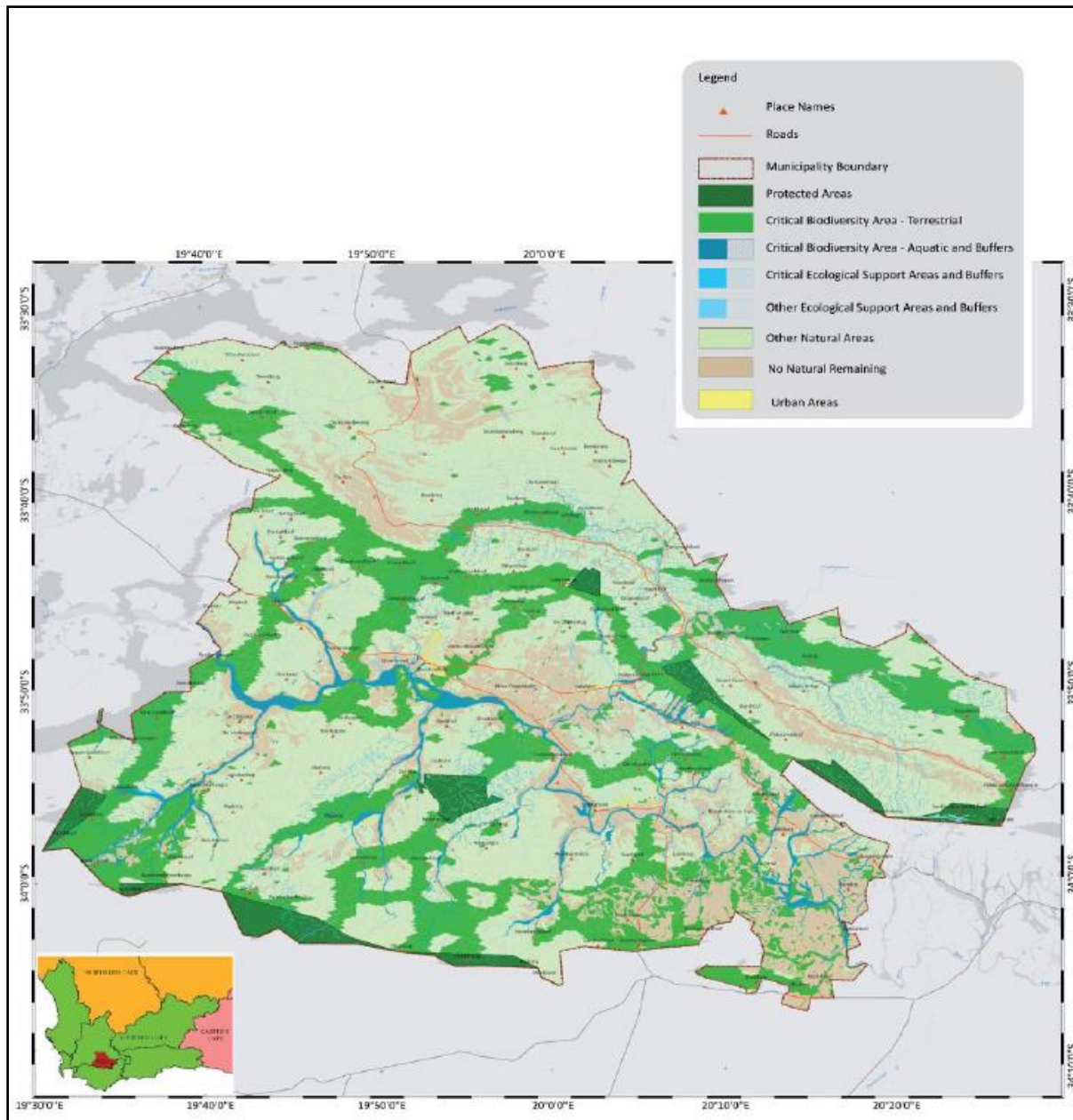


Figure 2.3: Critical Biodiversity Areas

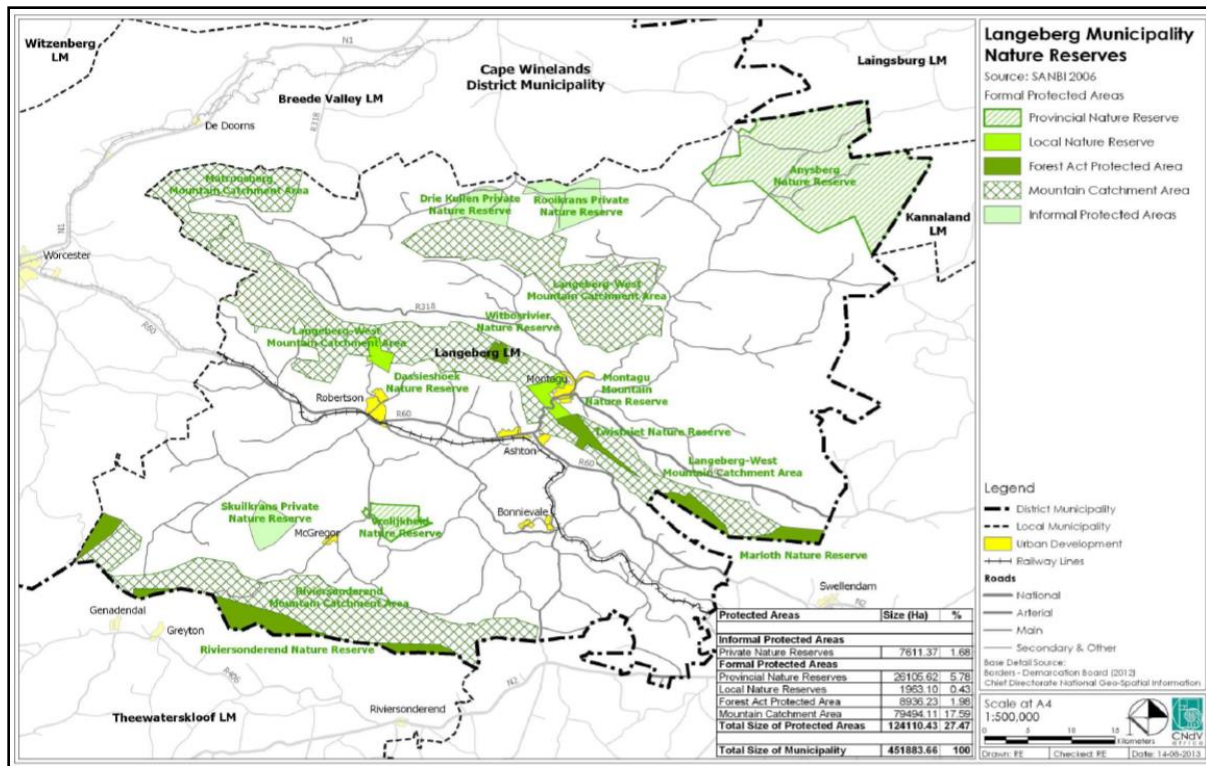


Figure 2.4: Reserves and protected areas

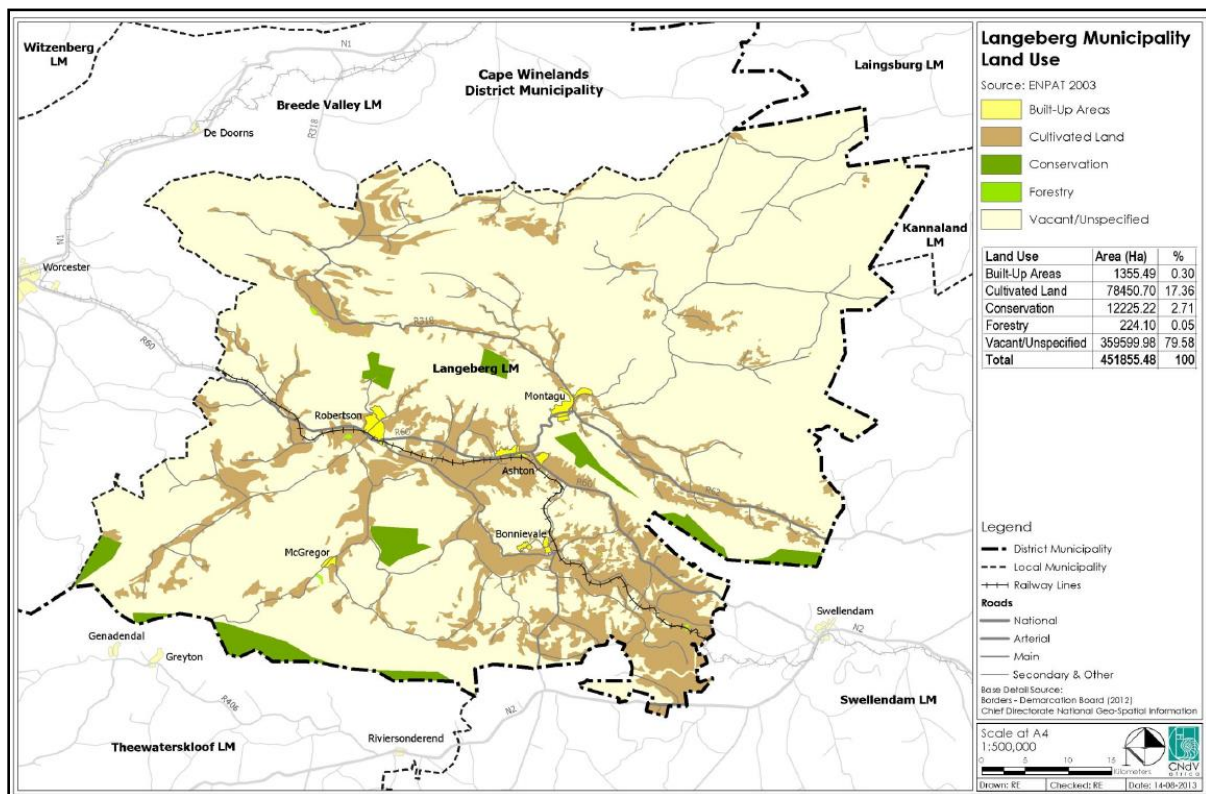


Figure 2.5: Land use

2.2.3 Langeberg Spatial Development Framework

The spatial vision for the LM is: *"An economically prosperous region and sustainable liveable environment for all Langeberg residents."*

The SDF Vision is in support of Langeberg IDP vision: *"To create a safe and healthy environment for delivering sustainable quality services"* (IDP, 2022).

The SDF notes that to attain this vision, the overall goal or mission is:

- To promote conservation and tourism in the Gouritz Cluster Biosphere, Riviersonderend Mountain Catchment Area, Langeberg West Mountain Catchment Area (including Dassieshoek, Montagu Mountain and Twisniet Nature Reserve), Matroosberg Management Catchment Area and Provincial Nature Reserves (Anysberg Nature Reserve and Vrolijkheid Nature Reserve) and Private Nature Reserves including Goedemoed, Skuilkrans and Mont Eco Nature Reserve.
- To enhance and intensify agriculture specifically in the Breede, Keisie and Koo Valleys.
- To strengthen sense of place of Langeberg settlements, rural areas, and scenic routes.

A SWOT analysis was undertaken as part of the SDF process. The relevant findings are summarised below.

Strengths

- Tourism nodes (McGregor and Montagu) with strong historic identity.
- Strong settlement character.
- Fertile and suitable soil for agricultural cultivation.
- Mountains and Hills: Langeberg, Riviersonderend, Waboom and Koega

Weaknesses

- Unemployment and poverty
- Low levels of income and income
- Low skills levels and largely young population.

Opportunities

- Access to Cape Town.
- Langeberg is home to export industries and business.
- Tourism linked to nature conservation initiatives.

Threats

- Climate change
- Insufficient electricity provision
- Poverty and unemployment

Based on the SWOT analysis of the Langeberg the SDF notes that the R60 and R62 is the main East-West connector while the R317 and R318 are the key North-South connectors. Of relevance to the study the SDF notes that the R317 and R318 are vibrant and growing tourism corridors. The tourism potential is linked to a range of factors including the natural Landscape. The SDF highlights the need to enhance landscapes and utilise them as tourist assets.

The conceptual proposal set out in the SDF notes that the has strong agricultural corridors running along the R60 East West bending South East and a long intensively cultivated corridor along the R 318 (Koo and Keisie) and R62. Figure 2.6 illustrates the conceptual proposal.

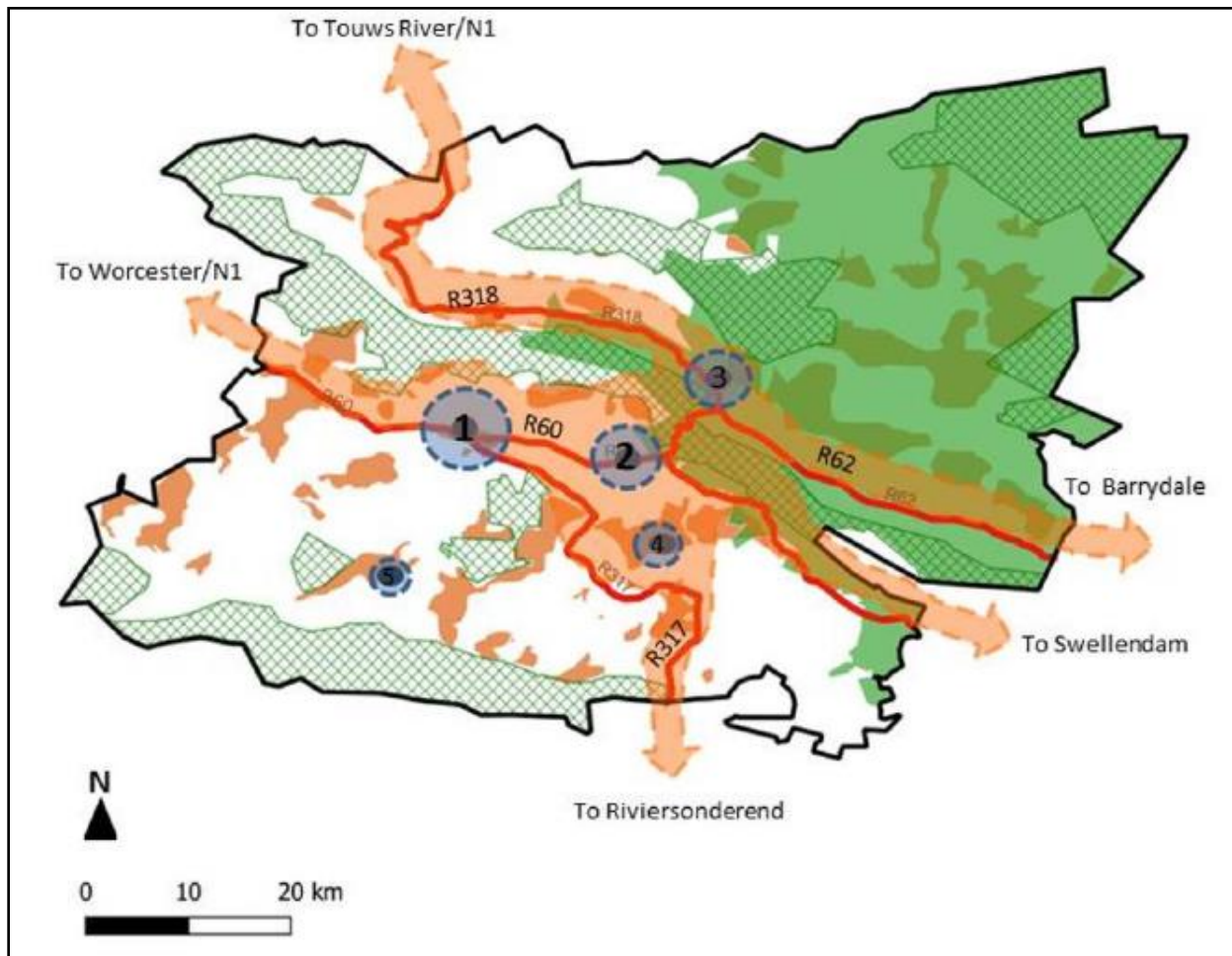


Figure 2.6: Conceptual proposal

To achieve the spatial vision, the SDF identifies five objectives that are informed by the IDP strategic objectives. The objectives are:

- Objective 1: Grow (& unlock) economic prosperity.
- Objective 2: Proximate convenient and equal access.
- Objective 3: Sustain material, physical and social well-being.
- Objective 4: Protect and grow place identity (sense of place).
- Objective 5: Protect ecological and agricultural integrity.

Objectives 1, 3, 4 and 5 are relevant to the project. Under Objective 4, the SDF lists two spatial strategies of importance, namely:

- SS11 Protect heritage resources & place identity.
- SS12 Grow economy (landscape & conservation, tourism & new markets and economic sectors) & stimulate sector diversification.

Under Objective 2, the SDF identifies the need to look at alternative sources of electricity for the municipality waste and water treatment plants. This approach should also apply to meeting other energy needs.

The SDF divides the LM into five bioregions that can be distinguished according to the natural environment and economy, namely:

- Anysberg – the northern Karoo plains much of it within the Anysberg Nature Reserve (CapeNature).
- The Koo – high lying valley well known for fruit, fruit processing and tourism. The project area is located within or near the Koo area.
- Keisies valley – high lying scenic valley with intensive agriculture and start of the R62 tourism route beginning in Montagu.
- Breede River Valley – intensely farmed, mainly vineyards and a wine producing area. Wine farms offer tourism attractions such as festivals, accommodation, restaurants, wine tasting. One of the most popular wine routes. Contains main settlements, Robertson, Ashton and Bonnievale.
- Riviersonderend Mountain Valleys – high lying series of three valleys – also intensive agriculture, mainly vineyards and tourism, but at a reduced level compared to the activities in the Breede River Valley.

The SDF comments on the renewable energy potential in these areas. The Koo area is indicated as medium to high levels of solar radiation Relatively low wind speeds. As indicated Figure 2.7, the proposed project is located in the Koo bioregion.

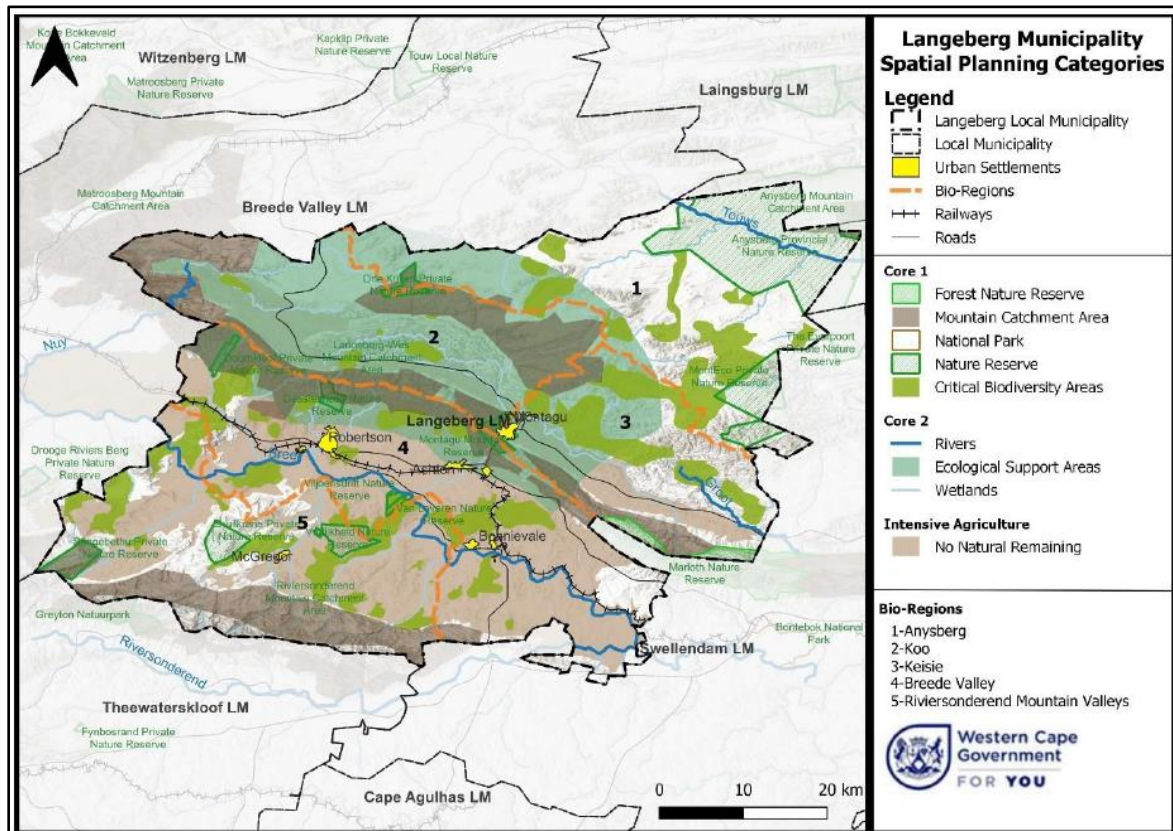


Figure 2.7: Location of bioregions in Langeberg Municipality

Section 6.1 of the SDF identifies development proposals for the Langeberg (Rural and Regional). The development proposals are linked to different resources, including water / hydrology, vegetation and fauna, minerals, etc. Of relevance the SDF also refers to development linked to air, wind and sun and highlights the need to promote the generation and use of alternative energy.

Vegetation, fauna, ecosystems

The key aspects listed that are relevant to the development include:

- The disturbance of ecosystems should be avoided, minimized, or restored.
- Develop in accordance with the identified bio regional planning categories e.g. Core Areas (Langeberge, Riviersonderend berg, Anysberge), Buffer Areas (along Riviersonderend and Langeberg & unprotected areas being part of the Biosphere), Intensive Agricultural (Breede Valley, Koo and Keisie) area and urban development.
- Promote the official categorization of all mountains and all Public and Private Nature Reserve as Core 1 and 2 areas.
- Promote use of rivers, mountains and other natural features to enhance tourism.

Agriculture and Conservation.

- Protect critical biodiversity areas, ecological corridors and natural habitats and provide for ecological links to support connectivity between habitat areas.
- Protect scenic routes and vistas and unique natural landscapes.
- Protect and conserve the agricultural landscape through development guidelines.
- Support evolving heritage as tourism destinations such as a cultural and landscape routes.

The SDF notes that the natural landscape provides a sense of place that reflects the cultural integrity and heritage of the environment. In this regard the Langeberg as a conservation and ecotourism area provides a magnitude of opportunities. As indicated in Figure 2.8, the R318 is identified as a tourism route.

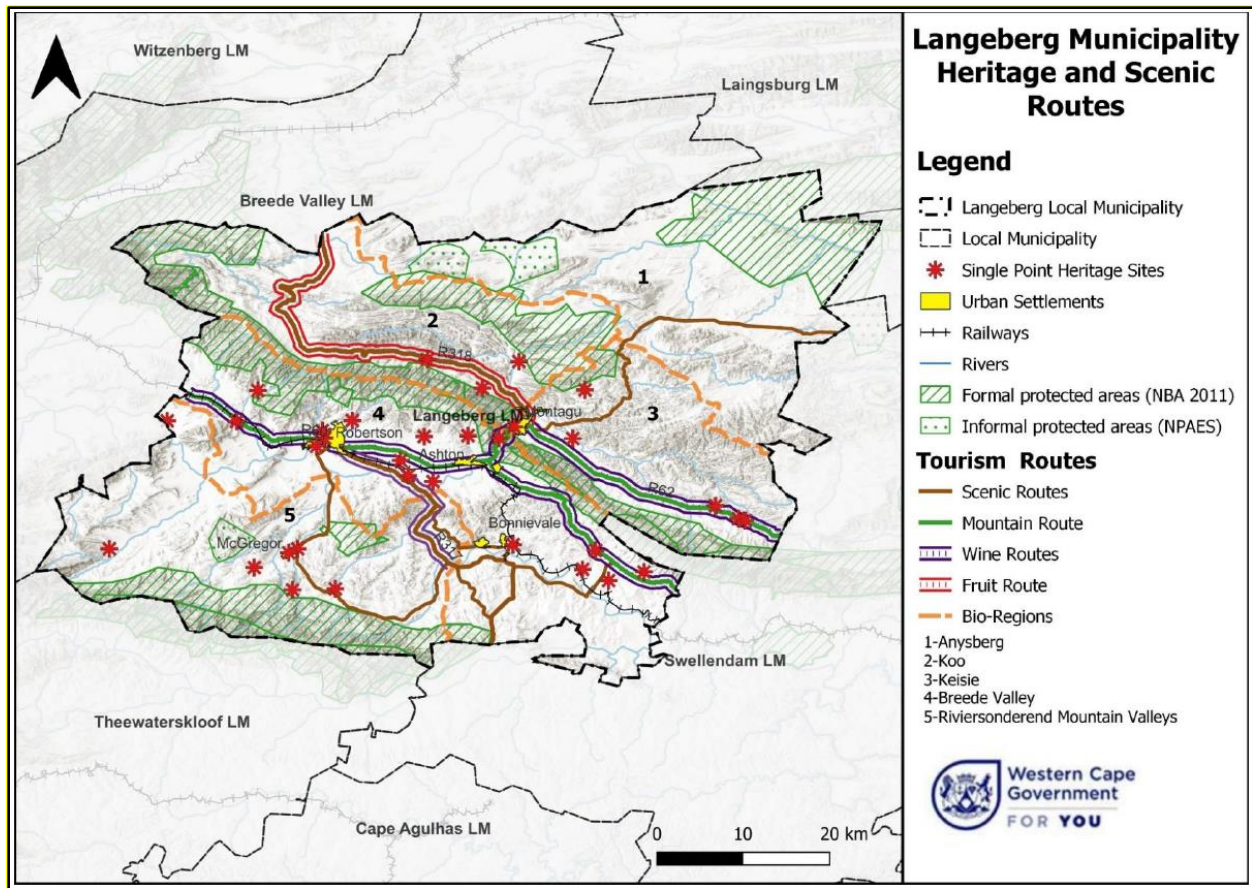


Figure 2.8: Langeberg Tourism Routes

Landscapes

- Preserve the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promote and protect the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promote tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

Energy

The SDF notes that opportunities for alternative energy sources, including solar and wind energy, should be identified. This includes promoting alternative energy generation facilities in viable zones only. Reference is made to management directive for alternative wind energy facilities. Figure 2.9 outlines the composite SDF plan for the LM and Figure 2.10 the spatial planning categories.

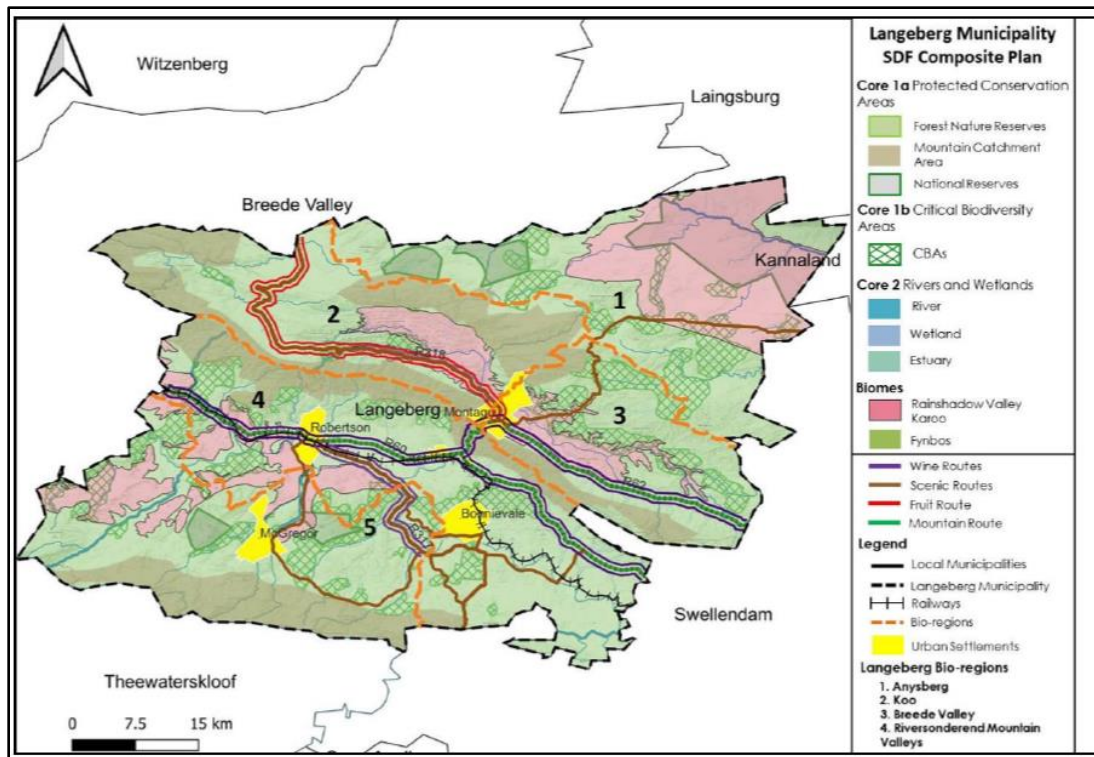


Figure 2.9: Langeberg Composite Proposal

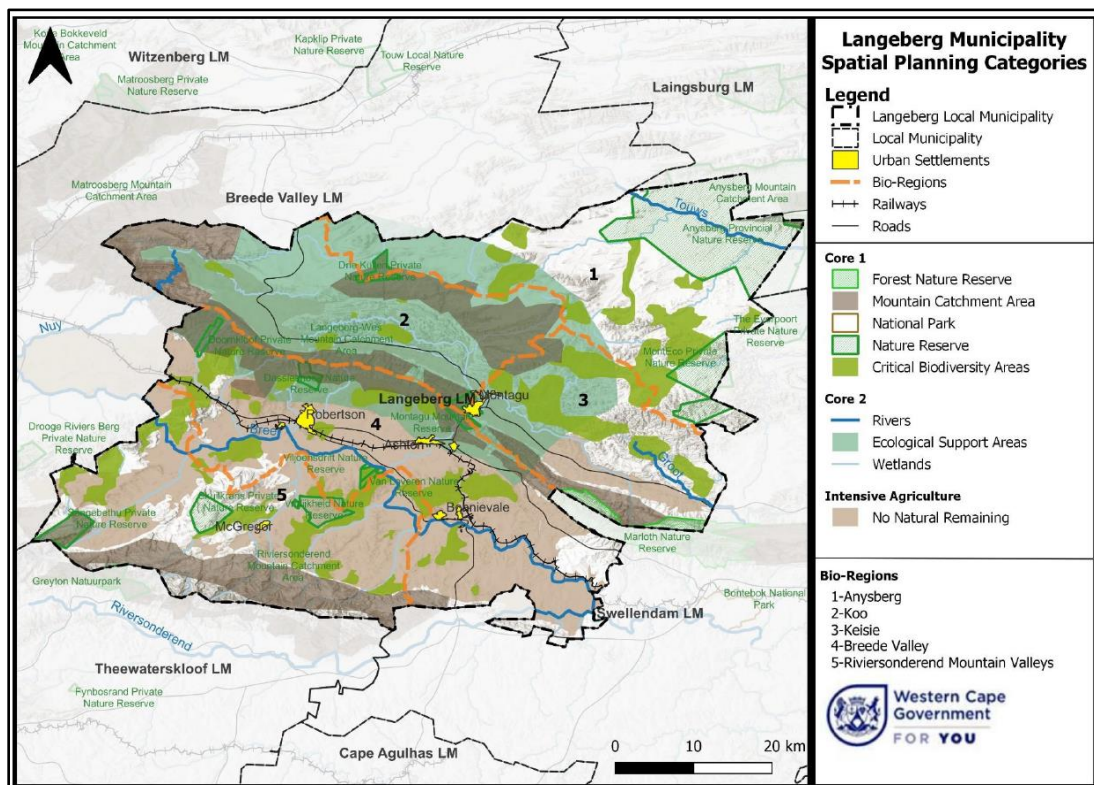


Figure 2.10: Langeberg Spatial Planning Categories

2.3 OVERVIEW RENEWABLE ENERGY SECTOR IN SOUTH AFRICA

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

The following documents were reviewed:

- Independent Power Producers Procurement Programme (IPPPP): An Overview (June 2020), Department of Energy, National Treasury and DBSA.
- Green Jobs Study (2011), IDC, DBSA Ltd and TIPS.
- Powering the Future: Renewable Energy Roll-out in South Africa (2013), Greenpeace South Africa.
- WWF SA, Renewable Energy Vision 2030, South Africa, 2014.
- Jacqueline M. Borel-Saladin, Ivan N. Turok, (2013). The impact of the green economy on jobs in South Africa), South African Journal of Science, *Volume 109 /Number 9/10, September/October 2013.*
- The potential for local community benefits from wind farms in South Africa, Louise Tait (2012), Master's Thesis, Energy Research Centre University of Cape Town.

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

The section below provides an overview of the potential benefits associated with the renewable energy sector in South Africa based on the information contained in the Independent Power Producers Procurement Programme (IPPPP): An Overview (December 2021), Department of Energy, National Treasury and DBSA. 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, 2022⁸):

- 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 IPPPPP 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

⁸ 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>.

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.

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 costs⁹), 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).

⁹ 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)

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 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 Content¹⁰

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 years¹¹ 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 and employing people. The number

¹⁰ Local content is expressed as a % of the total project value and not procurement or total project costs.

¹¹ The equivalent of a full-time employment opportunity for one person for one year

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
	Liquid fuel	Bio-fuels	Co-generation	10 789	1 050	L, M, H	M, H, H
			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 2.11).

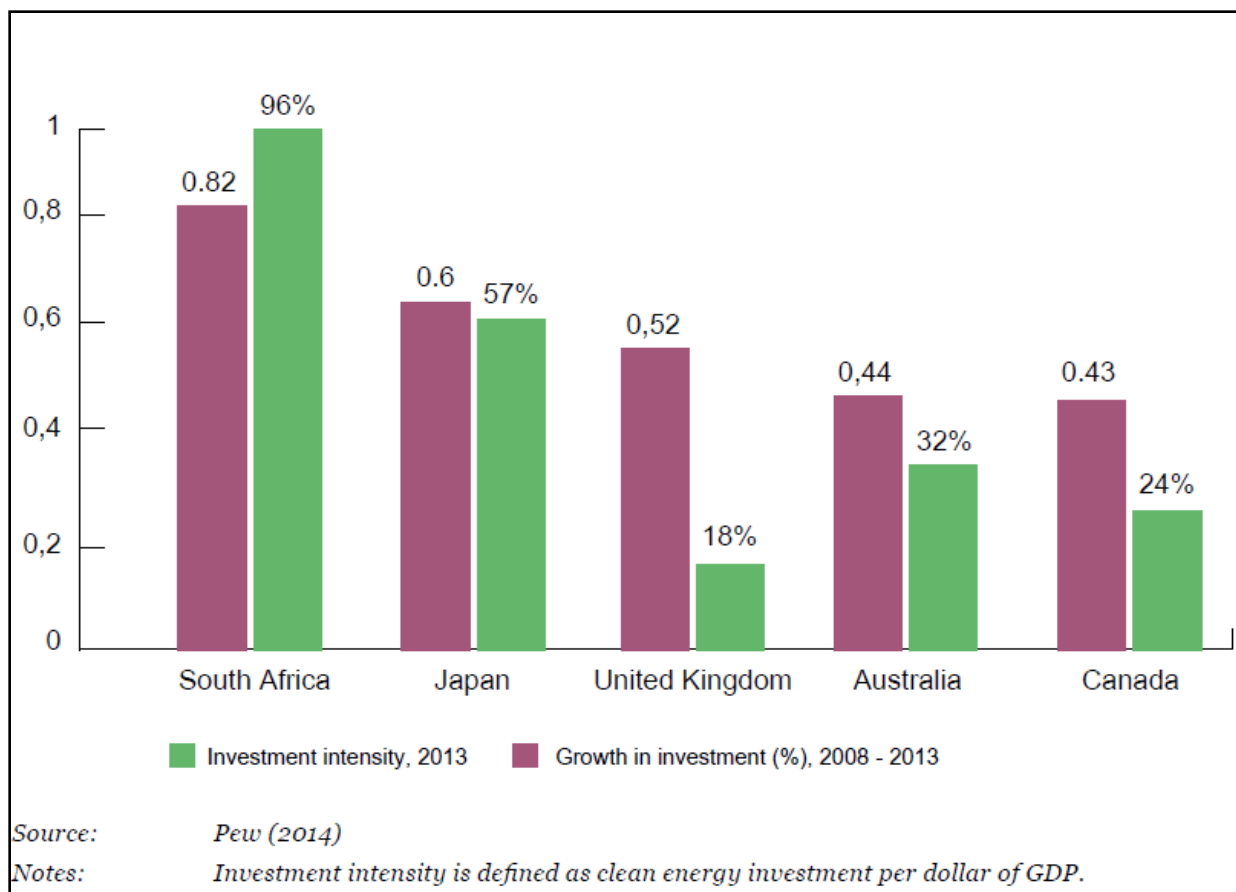


Figure 2.11: South Africa leads as a clean energy investment destination

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2.4.6 The potential for local community benefits

In her thesis, Tait¹² 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.

¹² 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.
- Overview of local municipalities.

3.2 ADMINISTRATIVE CONTEXT

The study area is located within the Langeberg Municipality (LM) within the Western Cape Province (Figure 3.1). The LM is one of five Local Municipalities that make up the Cape Winelands District Municipality. The town of Montagu is the administrative seat of the LM.

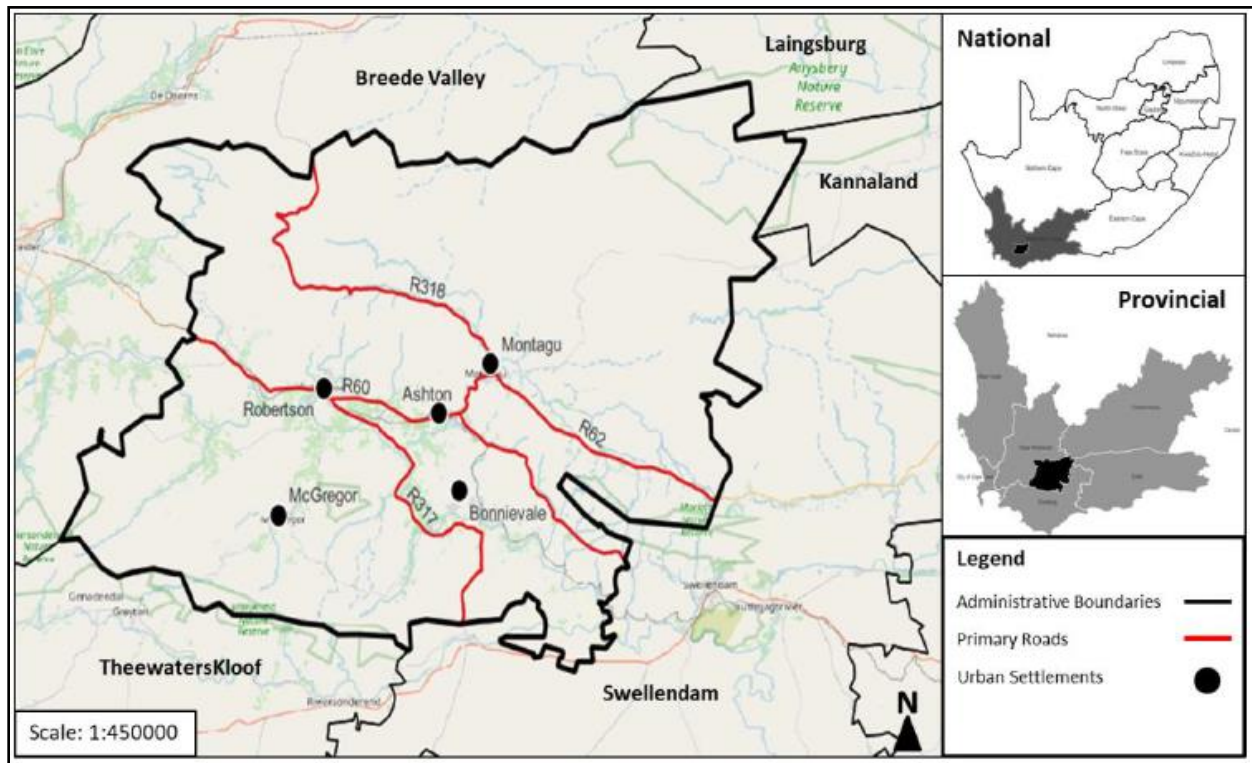


Figure 3.1: Location of Langeberg Municipality within the Western Cape Province

3.3 DEMOGRAPHIC OVERVIEW

Population

The 2020 Socio-Economic Profile (SEP) for the Langeberg Municipality (LM) prepared by the Western Cape Department of Social Development, indicates that the population of the LM in 2020 was 118 434 making it the second most populated municipality in the Winelands district Municipality. The population is projected to be 126 640 by 2024 which equates to a 1.7% annual average growth rate. Based on the 2022 Census data the population of the LM was 94 045, which is lower than the SEP figure and raises concerns about the accuracy of the

2022 Census data. The total number of households was 25 370, with an average household size of 3.7, slightly lower than the 3.9 figure for 2011.

Based on the SEP, young children under the age of 15 made up 29% of the population, the working age cohort (15-64) made up 65% and people 65 years and older made up 6%. Based on these figures the dependency ratio was 54%. Based in the data from Census 2022, children under the age of 15 made up 22.6%, the working age cohort (15-64) made up 69.7% and people 65 years and older made up 7.6%. Based on these figures the dependency ratio was 43.4%. The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates reduced revenue for local authorities to meet the growing demand for services. The difference between the 2020 SEP and 2022 Census data is therefore a concern.

The available 2022 Census data does not provide information on race groups or language. Based on the 2016 Community Household Survey Coloureds made up 75%, followed by Black Africans (17%) and Whites (12%). The main first language spoken was Afrikaans (80%), followed IsiXhosa (13%) by English (3%) (Community Household Survey 2016).

Household types

The 2022 Census data indicates that 91.7% of the households resided in formal dwellings, compared to 90.7% in 2011. This information is similar to the 2016 Household Community Survey which found that 88% of households lived in formal dwellings, while 9.3% resided in informal dwellings. The figure in the SEP is 90.4% lived in formal dwellings.

Household income

At the time of preparing the report no data on household income was available from the 2022 Census. The data is therefore still based on 2011 Census. Based on this data, 10% of the population of the LM had no formal income, 2% earned less than R 4 800, 4% earned between R 5 000 and R 10 000 per annum, 16% between R 10 000 and R 20 000 per annum and 25% between R 20 000 and R 40 000 per annum (2011).

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 57% of the households in the LM live close to or below the poverty line. The figures for the CWDM and Western Cape were 53.7% and 50.1% respectively. The low-income levels reflect the limited employment opportunities and dependence on the agricultural sector. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the LM. This in turn impacts on the ability of the LM to maintain and provide services.

Employment

The 2020 Socio-Economic Profile for the LM Municipality notes that the unemployment rate in the LM has been between 4.1 and 7.2% over the last 10 years and was 7.2% in 2019 (Figure 3.2). The figures are lower than WDM and provincial figures over the same period. The figure for the Western Cape in 2020 was 18.9%.

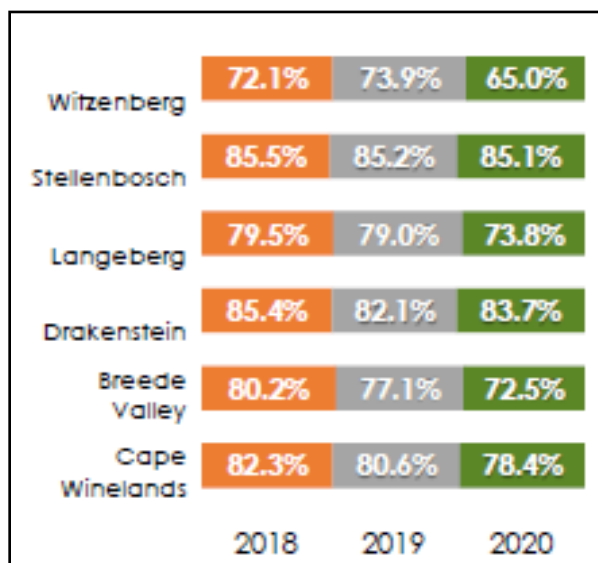
Unemployment rates	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Drakenstein	11.2	12.6	12.9	12.6	12.2	12.6	11.6	12.6	13.2	13.1	14.2
Langeberg	5.1	6.1	6.3	6.2	5.9	6.2	5.4	6.1	6.4	6.5	7.2
Stellenbosch	8.2	9.4	9.7	9.6	9.3	9.6	8.9	9.9	10.3	10.3	11.3
Witzenberg	5.8	6.8	6.9	6.6	6.1	6.4	5.4	5.9	6.2	6.2	6.7
Breede Valley	8.6	9.9	10.1	9.8	9.4	9.7	8.6	9.5	9.9	9.9	10.7
Cape Winelands	8.4	9.7	9.9	9.7	9.2	9.6	8.6	9.5	9.9	9.9	10.7
Western Cape	14.2	15.5	15.7	15.8	15.7	16.0	16.1	17.3	18.1	18.0	19.4

Source: SEP LM 2020

Figure 3.2: Unemployment rates for Langeberg Municipality

Education

Based on the information contained in the SEP, the matric pass rate in the LM was 73.8% in 2020, down from 79% in 2019 and 79.5% in 2018. After the Witzenberg and Breede Valley Municipality, the LM had the lowest matric pass rate in the WDM in 2020 (Figure 3.3)



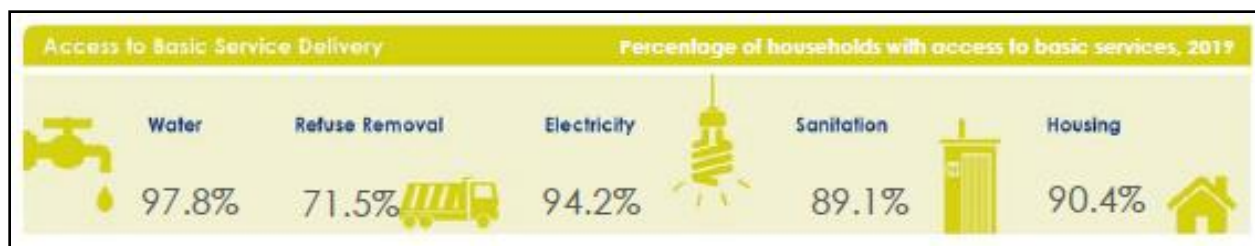
Source: SEP LM 2020

Figure 3.3: Matric pass rates for LM and CWDM

3.4 MUNICIPAL SERVICES

Based on the information from the 2020 SEP 94.2% of households in the LM had access to electricity, 97.8% had access to water, 89.1% had access to sanitation services, and 71.5% had their refuse removed on a regular basis (Figure 3.4). In summary, service levels in the LM can be described as good.

The figures from the 2022 Census indicate that 96.8% have access to electricity, 91.7% access to piped water, 96.3% are connected to sewage, and 85.7% have access to weekly refuse collection services. Some of the figures are similar to the SEP figures, while others are higher and or lower.



Source: SEP LM 2020

Figure 3.4: Summary of municipal services

3.5 HEALTH AND EDUCATION FACILITIES

Education facilities

Based on the 2021 SEP there are 52 schools in the LM, of which 45 (88%) are no-fee schools. This reflects the low income levels in the area. Less than 50% of the schools, (48%) are equipped with libraries.

Health care facilities

Access to healthcare services is a basic human right and one that is directly affected by the number and spread of facilities within their geographical area. In terms of healthcare facilities, there are 2 district hospitals in the LM, 7 health care facilities (fixed clinics, Community Health Care Centres, and Community Day Centres, 6 PHC Clinics (Satellite and Mobile) and 7 fixed PHC Clinics.

Child health is a key indicator of well-being and potential needs. The United Nations Sustainable Development Goals (SDGs) aim to end preventable deaths of new-borns and children under 5 years of age by 2030, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1 000 live births and under-5 mortalities to at least as low as 25 per 1 000 live births (Source: UN SDG's). Key criteria used to measure child health include immunisation rates¹³, percentage of malnourished children¹⁴, neonatal mortality rate¹⁵ and birth weight¹⁶.

The immunisation coverage rate for children under the age of one in the LM was 71% compared to 60.6% for the CWDM. The number of malnourished children under five years (per 100 000) in 2020 was 3.2, while the neonatal mortality rate (NMR) (deaths per 1 000 live births before 28 days of life) was 9.9 and the low birth weight was 14.9, compared to 3.3, 7.9 and 15.1 for the CWDM. The child health care conditions in the LM are therefore similar to the district.

¹³ **Immunisation:** The immunisation rate is calculated as the number of children immunised as a percentage of the total number of children less than one year of age. Immunisation protects both adults and children against preventable infectious diseases. Low immunisation rates speak to the need for parents to understand the critical importance of immunisation, as well as the need to encourage parents to have their young children immunised.

¹⁴ **Malnutrition:** Expressed as the number of malnourished children under five years per 100 000 people. Malnutrition (either under- or over-nutrition) refers to the condition whereby an individual does not receive adequate amounts or receives excessive amounts of nutrients.

¹⁵ **Neonatal mortality rate:** Measured as the number of neonates dying before reaching 28 days of age, per 1 000 live births in a given year. The first 28 days of life (neonatal period) represent the most vulnerable time for a child's survival. The Province's target for 2019 is 6.0 per 1 000 live births.

¹⁶ **Low birth weight:** Percentage of all babies born in facility that weighed less than 2 500 g. Low birth weight is associated with a range of both short- and long-term consequences.

3.6 ECONOMIC OVERVIEW

The Economic activity in the LM plays a key role in terms of creating employment opportunities and addressing poverty and human development. The ability of households to pay for services such as water, electricity, sanitation, and refuse removal is dependent upon the ability to generate income from economic activities. A slowdown or deterioration in economic activities typically results in job losses and the inability of households to pay for services, which in turn impacts on municipal revenues and the ability to provide and maintain services and municipal infrastructure.

Economic sectors

In terms of key sectors, the local economy in the LM was dominated by the tertiary sector which contributed 62% towards the Gross Domestic Product for the Region (GDPR)¹⁷ in 2018, followed by the Secondary Sector (25%) and the Primary Sector (13%) (Figure XX). Within Tertiary Sector, the most important subsectors were Finance, insurance, real estate and business services (19% towards GGDP) and Wholesale and retail trade, catering and accommodation (17% towards GGDP), each contributing more than the entire Primary Sector. The Agriculture, forestry and fishing subsector within the Primary Sector contributed 13% towards GGDP.

Employment

In terms of employment, the Tertiary Sector was made up 60% of all jobs in 2019, followed by the Primary Sector (26%) and the Secondary Sector (14%) (Figure 3.5). However, in terms of subsectors the Agriculture, forestry and fishing sector was the most important sector in 2019, making up 26% of all jobs, followed by Wholesale and retail trade, catering and accommodation (24%), and Finance, insurance, real estate and business services (13%). The COVID-19 pandemic is likely to have resulted in job losses during 2020, extending into 2022/23.

In terms of skills levels, the labour forces in the BVM in 2020 consisted mainly of low-skilled (45.7%), followed by semi-skilled (37.9%) and skilled (16.4%) workers. The high percentage of low and semi-skilled workers is linked to the agricultural sector.

¹⁷ Gross domestic product of a region (GDPR) is the standard measure of the value added created through the production of goods and services in a region (the LM) during a certain period.

SECTOR	GDPR			Employment		
	R Million value 2018	Trend 2014 - 2018	Real GDPR growth 2019e	Number of jobs 2018	Average annual change 2014 - 2018	Net change 2019e
PS Primary Sector	908.8	-0.9	-10.0	14 016	44	-184
Agriculture, forestry & fishing	898.1	-0.9	-10.1	13 998	45	-183
Mining & quarrying	10.7	1.2	-2.9	18	0	-1
SS Secondary sector	1 762.6	0.1	-2.2	7 402	88	-355
Manufacturing	1 238.9	-0.6	-2.2	4 650	0	-140
Electricity, gas & water	149.9	2.6	-2.0	106	2	0
Construction	373.8	2.3	-2.5	2 646	85	-215
TS Tertiary sector	4 324.2	3.4	2.5	32 623	980	316
Wholesale & retail trade, catering & accommodation	1 354.7	2.8	1.2	12 981	401	282
Transport, storage & communication	743.6	4.0	1.8	2 119	63	129
Finance, insurance, real estate & business services	1 187.3	5.1	4.7	7 202	328	27
General government	573.0	0.6	1.2	3 425	51	71
Community, social & personal services	465.6	2.5	1.6	6 896	137	-193
Langeberg	6 995.6	1.9	-0.3	54 041	1 112	-223

Source: SEP LM 2020

Figure 3.5: Summary of GDPR and Employment for LM

3.7 OVERVIEW OF STUDY AREA

3.7.1 Introduction

As indicated above, the study area is located ~ 30km northwest of Montagu within the Langeberg Municipality (LM). As indicated in Figure 3.6, the site straddles the R 318 which is a designated tourist route (LM SDF, 2023). The R318 links Montagu to the south to the N1 to the north. The proposed Hugo WEF is located ~ 8-10 km north of the Khoe WEF, and also straddles the R318. An initial review of available information indicates that there are a number of provincial and private nature reserves and tourist facilities located in the area. The attraction to the area is linked to the natural landscape and rural character, including the areas vitas and views. The proposed Khoe WEF is therefore located in an area that is visually sensitive. Figure 3.7 illustrates the location of private and provincial nature reserves in the area. The Koo Valley is located to the south of the site, and it an important fruit growing area.

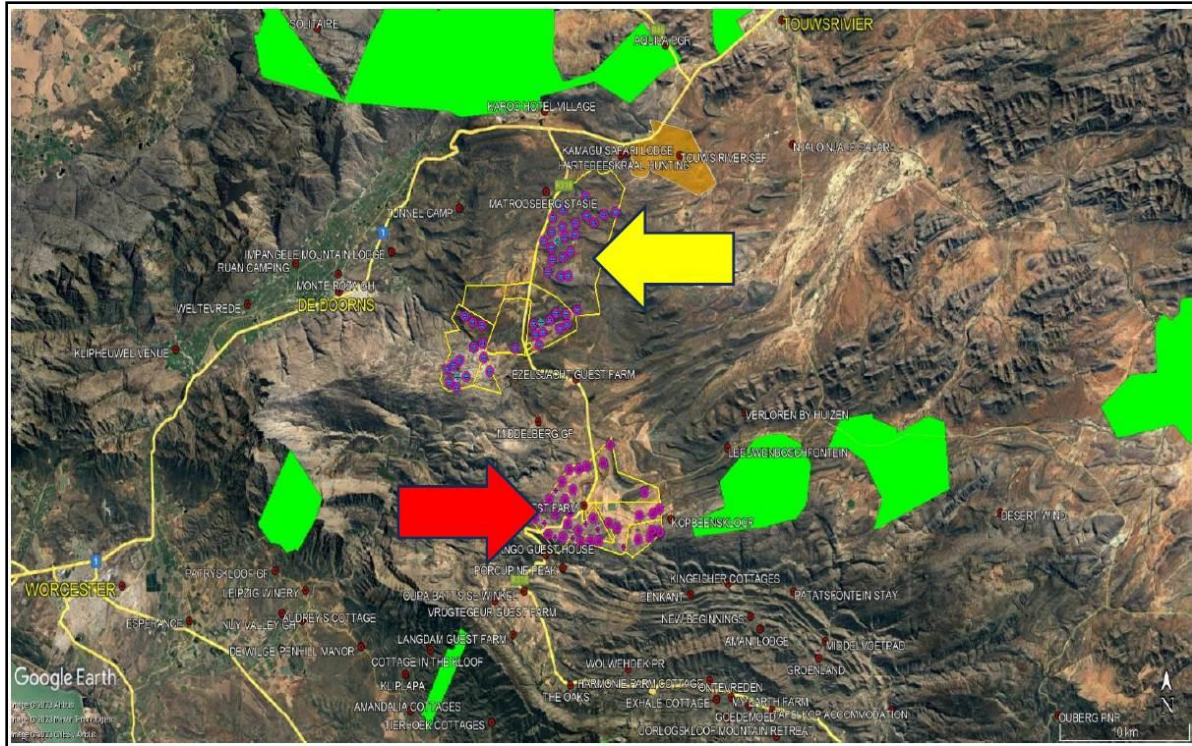


Figure 3.6: Location of Khoe WEF (red) in relation to Hugo WEF (yellow) and nature reserves

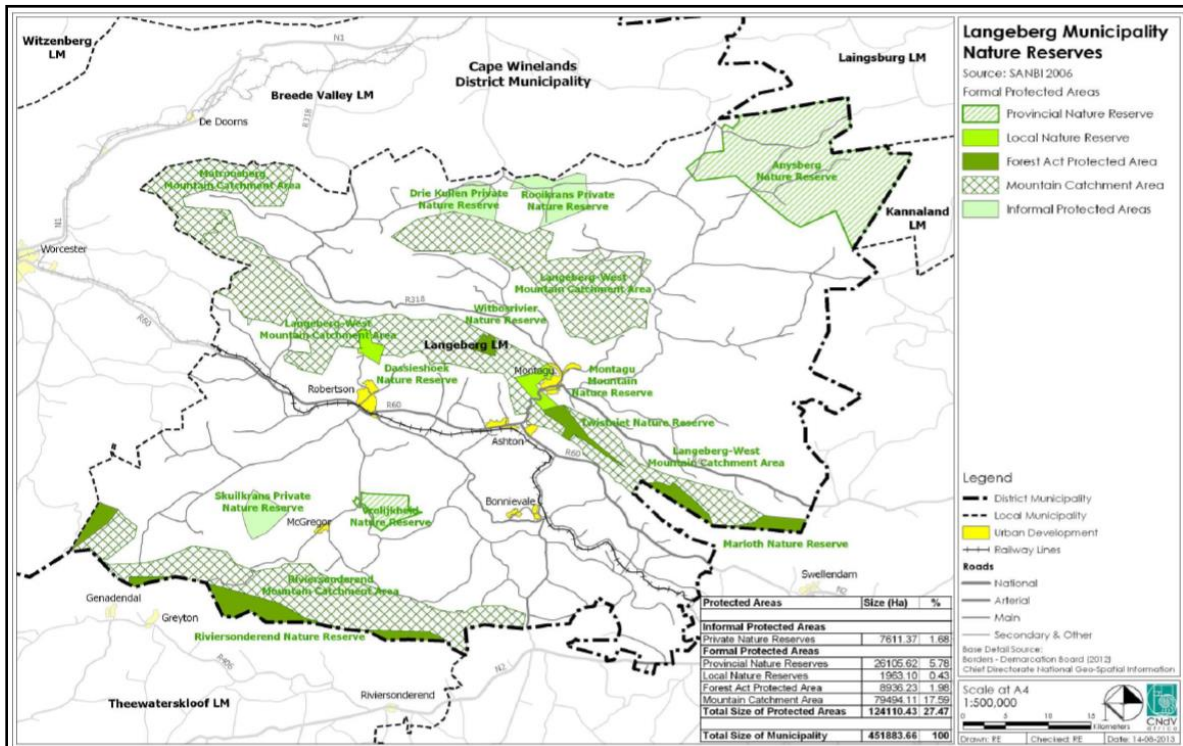


Figure 3.7: Reserves and protected areas

3.7.2 Introduction

The Khoe WEF site is located in the north-western part of LM in the Cape Winelands District Municipality (CWD) (Figure 3.8). The study area is rural. The town of Montagu located approximately 25 km (linear) southeast of the site, is the nearest town (by road). The other key towns in the LM, Ashton (Langeberg LM seat, 26 km south-east) and Robertson (17 km south) are only accessible via Montagu. The site is located just to the south of the boundary with the Breede Valley MLM. Worcester, located approximately 30 km west of the site, is the seat of the Breede Valley Municipality (BVM) and the nearest large town in the broader region. Other settlements in the BVM include the small towns of De Doorns in the Hex River Valley, and Touwsrivier. The site is located approximately 25 km south-east of De Doorns, and approximately 28 km south-west of Touwsrivier.

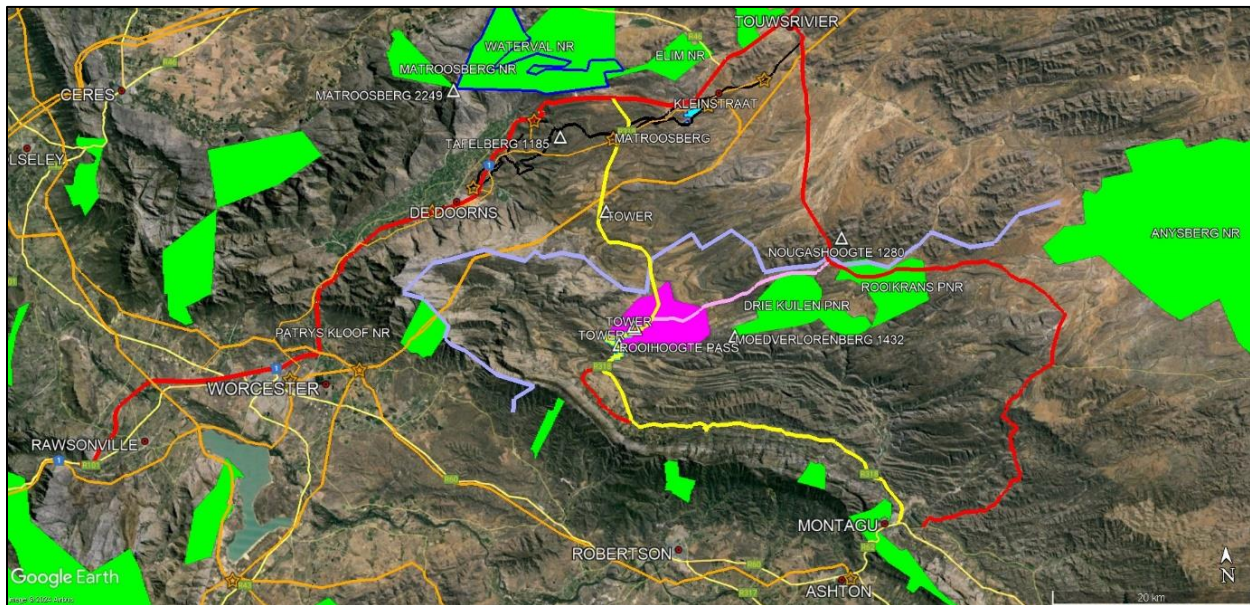


Figure 3.8: Khoe WEF site (pink fill) in relation to Langeberg LM boundary (grey), settlements, the R318 (yellow), Nougaspoot road (light pink) and other key roads (red), protected areas (green fill; world heritage site dark blue outline¹⁸), railway lines (black), Eskom lines (orange), and operational Touws River PV (light blue fill)

Primary access to the study area is via the R318 ('Koo Road') and the Nougaspoot gravel road. The R318 links the N1 to the north of the site to Montagu via the Rooihoogte Pass and the Koo region to its south. The R318 intersection with the N1 is located approximately 7 km east of the top of the Hex River Pass on the N1 (Photograph 3.1). The site is located approximately 20 km south of N1 and straddles the R318. A portion of the scenic Rooihoogte Pass is located on the site. Due to the topography (Langeberg range), there are no public road links to the west. The R318 intersects with the R62 in Montagu. The R62 forms part of the well-established Route 62 tourism route. The R318 functions as a link between the N1 and the R62 corridors.

¹⁸ Based on DFF&E's Register of Protected Areas, Western Cape Department of Agriculture Cape Farm Mapper, and input from Drie Kuilen PNR. Mountain Catchment Areas not indicated.



Photograph 3.1: Intersection of N1 and R318

The Nougaspoot public gravel road intersects with the R318 at a T-junction on the site (Photograph 3.2). The road provides a link between the R318 to a public gravel road which links Touwsrivier to Montagu further to the east. Several study area tourism operations gain access off the Nougaspoot Road, e.g. Eximia, Leeuwenboschfontein, Drie Kuilen and Gecko Rock. Interviewees indicated that most of their traffic flows are off the R318 (and not the Touwsrivier-Montagu Road).



Photograph 3.2: Intersection of R318 and Nougaspoot gravel road, viewed from the south, farm yard on Eendragt 38/11 in the middle distance

Existing service-industrial infrastructure in the study area is limited. A cluster of telecoms towers are located at the crest of Rooihogte Pass on the site. The towers are visible from the northern approach to the pass on the R318 (Photograph 3.3). No Eskom transmission or distribution lines are located in the immediate study area. The nearest transmission line is a 132 kV corridor (2 lines) which crosses the R318 approximately 11 km north of the site. The nearest substation, a small one at Matroosberg rail siding, is located approximately 15 km north of the site. The nearest operational renewable energy facility (REF), the small Touws River Solar facility, is located just to the south of the N1, approximately 16 km to the north of the site. In summary, apart from the telecom towers and roads no major service-industrial infrastructure is located in the immediate study area.



Photograph 3.3: Telecoms towers on Eendragt 38/1 at the crest of the Rooihoogte Pass, seen from the R318.

The site is located in an area known as the Agterveld ('back veld') or Hoëveld ('high veld'). These names reflect the study area's elevated location relative to the Hex River Valley to the west and the Koo Valley to the south. The study area is enclosed by mountainous terrain associated with the Kwadouberg and Langeberg to the west and south-west, and the Waboomsberge - which is partially located on the site to - the south. The Waboomsberge demarcates the transition into the lower-lying Koo, an important stone fruit farming area. The study area terrain is mountainous to gently undulating, but also includes broad valley floors. The Hex River range and the prominent Matroosberg north of the Hex River Valley are visible in much of the immediate study area (Photograph 3.4).



Photograph 3.4: View looking west along the Nougaspoot gravel road from Leeuwenboschfontein estate, Matroosberg on the distant horizon.

The study area is arid, with a mean annual rainfall of 200-300 mm, most of which falls in winter. The Waboomsberge is well known for snowfalls in cold years. The study area is often referred to as 'Karoo' but actually sits at the interface of the Fynbos and Succulent Karoo biomes. Three vegetation types are represented: Sandstone Fynbos on mountainous terrain to the west (Kwadouwsberg) and south (Waboomsberge) of the site, broad bands of Shale Renosterveld flanking the R318 and Nougaspoot Road, and Little Karoo veld south of Touwsrivier (Photograph 3.5).



Photograph 3.5: Renosterveld on Helpmekaar 148/9

The study area economy and land use are based on agriculture. Primary agriculture is however on the decline and is being replaced by lifestyle- and weekend farming, conservation, and nature-based tourism. Current agricultural activities are largely based on raising livestock, but also includes limited cropping. Sheep, goats, and cattle are kept. Veld carrying capacities (grazing potential) are low to very low, ranging from 1 Large Animal Unit (LSU) per 54 ha on Little Karoo veld, to 1: 72 on shale renosterveld (site and surrounds) to 1: 108 on the sandstone fynbos¹⁹. While livestock is associated with most study area properties, stock theft is not currently considered problematic. This is linked to the relative isolation of the study area, low stocking concentrations, and limited public access roads. Security cameras are located at various points along the R318.

Dryland cereal cropping is confined to broad valley floors on renosterveld shale soils (Photograph 3.6). The study area is a marginal cereal cropping area, with average harvests around 1 ton/ ha. Dryland cropping has been abandoned or reduced on many properties. Irrigated cropping is confined to modest plantings of vegetable seed, fodder crops, vegetables and stone fruit near watercourses or fountains. Given the nature of operations, limited permanent employment opportunities are associated with agriculture in the area.

As indicated above, private conservation and tourism are becoming important land uses in the study area. In many instances, tourism and farming uses are combined to varying extents, while a few are primarily focused on eco-/ wilderness tourism in a conservation setting. Several protected areas, mainly privately owned, are located in the broader study area. In the immediate study area, formally protected areas and private conservation areas are located to the east of the site along the Nougaspoort (Drie Kuilen Private Nature Reserve, Rooikrans Private Nature Reserve (PNR) and Gecko Rock PNR) and south of the Langeberg in the Breede Valley (Patryskloof, Doornhoek, Dashoek).²⁰ The Eximia Private Game Reserve is currently in the process of being established to the east of the site.

¹⁹ <https://gis.elsenburg.com/apps/cfm/>

²⁰ Gecko Rock is not indicated on the DFF&E's Register of Protected Areas, and Drie Kuilen only partially.



Photograph 3.6: Dryland cereal cropping on Eendracht 37/RE (site)

The scenic fruit-farming Koo Valley to the south of the Waboomsberge is a well-established agri-tourism destination. Numerous farm stay accommodation facilities are offered and Langdam is popular wedding venue (Photograph 3.7). Protea Farm is well-known for its tractor rides on the northern slopes of the Langeberg. All the Koo receptors are directly or indirectly accessed off the R318.



Photograph 3.7: The Koo viewed from the Rooihoogte Pass with Langeberg in the background

As indicated above, the R318 links the N1 corridor to the important tourism town of Montagu, and from Montagu to Route 62. The R318 is as a scenic route in the 2022 Langeberg SDF. The R318 is also regarded as a scenic road by Breede Valley LM and Touwsrivier Tourism. The Rooihoogte Pass, constructed by Tomas Bain in 1877, is identified as of 'high historical, technological and scenic value', and a 'scenic/ linking route of secondary importance' in the Heritage and Scenic Resources Inventory and Policy Framework for the Western Cape (Terramare, 2023).

Agterveld tourism primarily caters to the 'breakaway' urban Cape Town and Boland-based market, supplemented by international visitors and overnight stays associated with travellers on the N1. The study area is generally marketed as the nearest/ most accessible part of the 'Karoo' relative to the Cape Metropolitan area. The key anchoring attractions are include the scenic setting, the rich natural environment, wilderness qualities, and the starry night skies.

Both the natural environment and 'Karoo farm' qualities are emphasized. Key activities include hiking, biking, rock climbing, snow viewing, fishing (in farm dams), and 4x4 routes. No commercial hunting is associated with the study area. Game viewing and safari tourism is limited to Aquila located to the north of the N1, and Njalo Njalo Safari south of Touwsrivier, neither in significant proximity to the site. Local operations however benefit from spillovers from Aquila. Some also offer safari excursions to Aquila for guests.

3.7.3 Site properties

The Khoe site is comprised of 5 properties, namely, Eendragt 37/RE, Eendragt 38/1, 38/2, 38/11, and Farm 193. Turbines are proposed on all 5 site properties but are concentrated in the southern and western site portions of the site. Wind turbines are located on either side (east and west) of the R318 (Figure 3.9). As indicated above, the R318 is identified as a scenic route in Langenberg Municipality Spatial Development Framework. The preferred substation, BESS, O&M and construction laydown terrains cluster site is located approximately 130 m west of the R318 on 38/1. The alternative site is proposed 110 m south of the Nougaspoot road on 37/RE. Site access is proposed off multiple access points directly off the R318 and Nougaspoot Road – 8 points (including substation complex) off the R318, and 3 off the Nougaspoot Road.

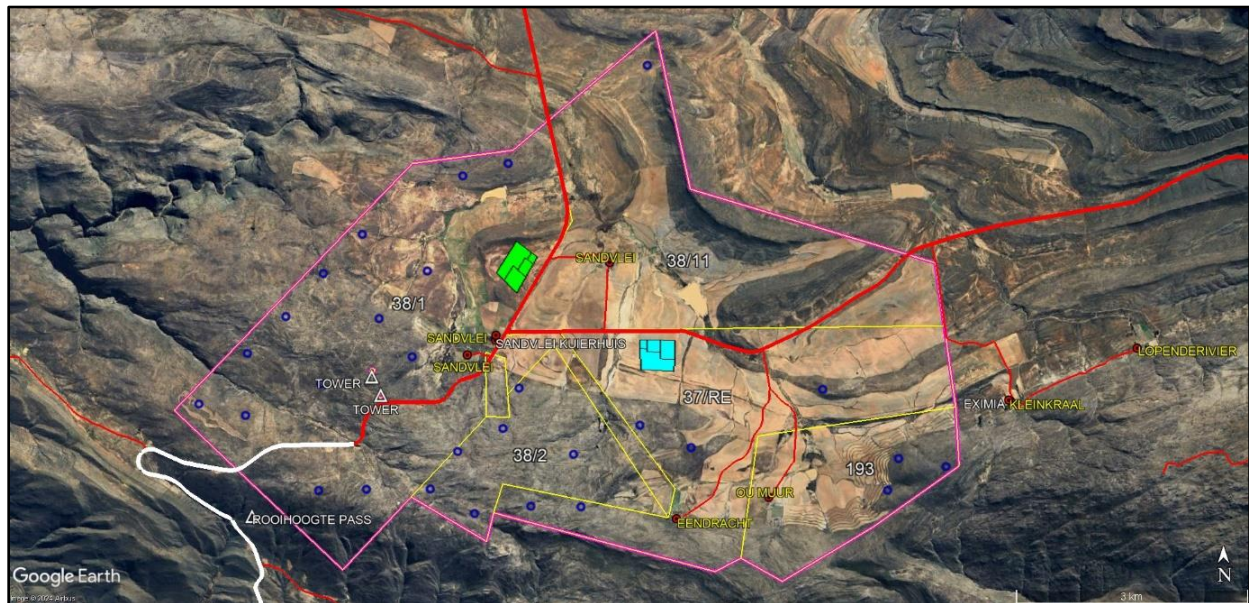


Figure 3.9: Khoe WEF site (pink) and constituent properties (yellow) in relation to proposed infrastructure: turbines (blue circles), and construction and operational cluster sites: Preferred (green fill) and Alternative (blue fill). Also indicated are key roads (red) and Rooihoogte Pass (white)

The 3 portions of Eendragt 38, as well as site-adjacent Kalkoenvlakte 6 (to the west) and Farm 626 (enclosed by site) are owned by Mr Hennie de Kock. Eendragt 37/RE and Farm 193 are owned by Mr Johan le Roux. Both owners reside on the properties. Both properties are primarily used for livestock farming and small-scale dryland cereal cropping (Photograph 3.8). Vegetable seed is also grown on a small scale on 33/1. The extreme southern and western site portions consist of mountainous terrain of low grazing value. Actively cropped land is concentrated on a portion east of the R318, along the Nougaspoot road.



Photograph 3.8: Sheep grazing on stubble near Sandvlei yard on Eendracht 38/1

Mr De Kock resides on 38/1. The farmyard (Sandvlei) is located along the R318, just to the south-west of the R318/ Nougaspoot intersection. His son resides on 38/11 (also Sandvlei) to the east of the R318 further to the north (Photograph 3.9). Both farmyards are accessed directly off the R318. Three worker households live on 38/1, near the werf. Two tourist accommodation facilities, Sandvlei Kuierhuis and Skuinshuisie cottage, are located on 38/1, close to the R318 on the periphery of the yard. The operation is supplementary to farming caters mainly to the 'Karoo breakaway' market and is not considered to be visually sensitive by the owner (Photograph 3.10). The northernmost portion of the Rooihogte Pass is located on 38/1.



Photograph 3.9: Looking north across Eendracht 38/1 from near communication towers at the crest on the Rooihogte Pass with Sandvlei yard in middle distance



Photograph 3.10: Sandvlei Kuierhuis guest accommodation on Eendracht 38/1

Mr le Roux resides on Eendracht (37/RE), and his son on Ou Muur (193). Both farmyards are located on the lower northern slopes of the Waboomsberge (Photograph 3.11 and 3.12). Access to both properties is via a single road off the Nougaspoot Road. Two worker households reside on 37/RE. No tourism is associated with the properties.



Photograph 3.11: Looking south across Eendracht 37/RE from Nougaspoot Road, Ou Muur and Eendracht farmsteads in the distance.



Photograph 3.12: Ou Muur yard on Farm 193

No layout issues were raised by the two relevant landowners. Neither of the access roads to the yards on the de Kock properties would be affected by project traffic. With regard to the le Roux properties, the initial common road portion and both forks would be affected by project traffic over short distances. Turbine footprints would affect veld used for grazing (32 turbines) and an abandoned cropping area on 38/1 (2). Most turbines are proposed on higher-lying broken terrain of low grazing potential. No land actively used for cropping would be affected. The proposed turbine layout is acceptable to both landowners. Both substation sites are acceptable to the relevant owners. The site on 38/1 is located on an abandoned field, while the site on 37/RE is on a low potential cropping area. Both locations are also considered sufficiently distant from residential/ tourism receptors. Both owners indicated that income from the project would significantly increase the sustainability of farming operations (De Kock, Alex and Johan le Roux, pers. comm).

3.7.4 Adjacent properties

The site borders onto 17 properties (Figure 3.10). Farmyards and residential receptors are only associated with Eendragt 38/RE (Porcupine Peak) and Eendracht 256 in the upper Koo to the south of the site, and Farm 34 (Kleinkraal) to the east of the site.

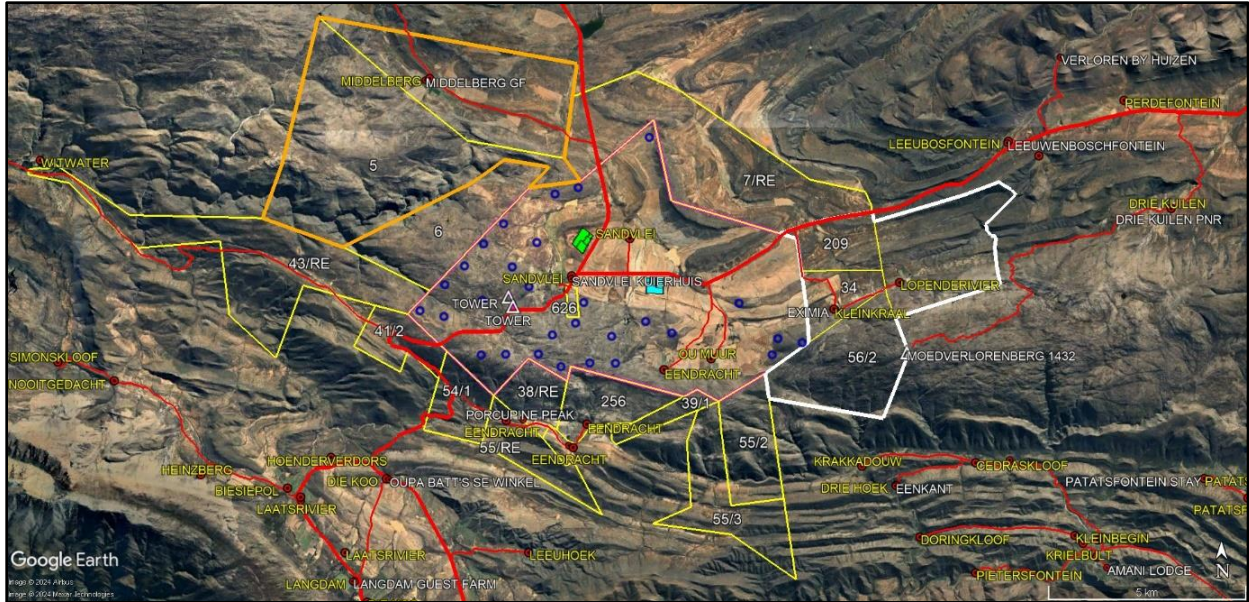


Figure 3.10: Khoe WEF site (pink) and proposed infrastructure in relation to adjacent properties (yellow) and farmsteads: turbines (blue circles), construction and operational cluster sites: Preferred (green fill) and Alternative (blue fill). Also indicated are public and access roads (red), Eximia estate (white outline) and Middelberg estate (orange)

The properties located to the west and south-west largely consist of mountainous veld used for limited grazing. Properties to the south-east of the site in the Koo are predominately involved in the cultivation of fruit (stone fruit and pecan nuts) (Photograph 3.12). Portions of properties to the north of the site were historically used for dryland cropping, but activities have been suspended. Fields on Farm 34 are being intentionally rewilded.



Photograph 3.12: Orchards on Leeuw Hoek 54/1 in the Koo south of the Khoe site

Existing and planned tourism is associated with three adjacent properties. Farm 34 forms part of the Eximia Private Game Reserve which is currently in the process of being established. The existing Kleinkraal farmstead and other buildings on the yard have been earmarked for redevelopment into tourist accommodation. In addition, new tourist accommodation is planned on Farm 34 and Krakadouw 56/2. Farm 5 forms part of Middelberg farm. The farmstead and guest accommodation facilities are located on non-site adjacent Ezelsjacht

171/2. Tourist accommodation is located on both portions of Porcupine Peak which border onto the site (namely Eendragt 38/RE and Koenies Kraal 55/RE).

These and other tourism operations in the immediate vicinity are discussed below. Key issues raised by adjacent owners all relate to potential impacts on tourism and are summarised below.

3.7.5 Tourism receptors

Key tourism receptors are located to the north, east and south of the site (Figure 3.11). Depending on location, some of the properties benefit from limited to variable screening by the natural topography. Receptors to the north consist of Middelberg- and Ezelsjacht guest farms. A continuous band of proposed and existing tourism-focused estates are located to the east of the site on both sides of the Nougaspoort Road, namely Eximia Private Game Reserve, Leeuwenboschfontein Guest Farm, Drie Kuilen Private Nature Reserve, and the Gecko Rock Private Nature Reserve further to the east. Smaller receptors include Verloren by Huizen guest accommodation east of Leeuwenboschfontein.

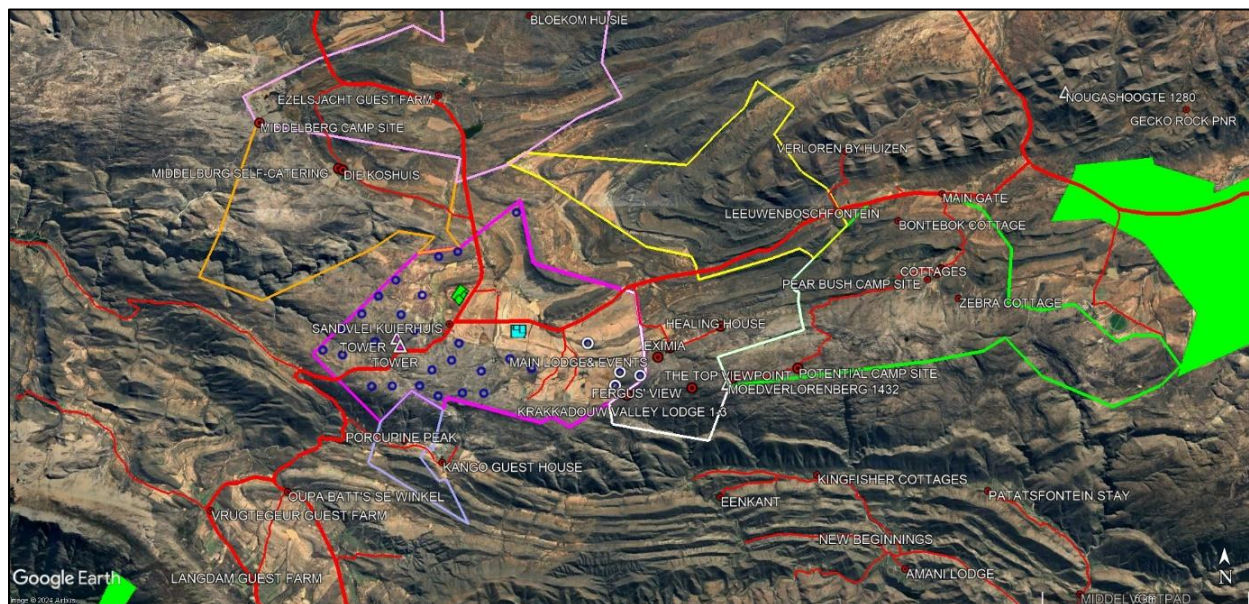


Figure 3.11: Khoe WEF site (pink) and proposed infrastructure in relation to nearby tourism receptors and estates, namely Middelberg (orange), Ezelsjacht (light pink), Leeuwenboschfontein (yellow), Drie Kuilen NPR (green), Eximia (white) and Porcupine Peak (grey). Also indicated are existing public and access roads (red), other protected areas (green fill), proposed turbines (blue circles) and construction and operational cluster sites: Preferred (green fill) and Alternative (blue fill). Turbine locations identified as problematic by Eximia and Drie Kuilen circled in white.

Receptors in the Koo to the south of the site are largely screened by the Waboomsberge, although turbines near the ridgeline may be visible. Given the steep terrain on the reverse (southern) slope of the Waboomsberge, more distant receptors on the facing (northern) slopes of the Langeberg are likely more visually exposed. The key Koo receptors are Porcupine Peak guest farm, and Langdam guest farm and wedding venue. Other nearby Koo receptors are essentially single guest cottages on primarily working farms. The natural topography

screens the site from the Hex River Valley and associated tourism receptors to the west and north-west. An overview of key tourism receptors is provided below. Discussion is clockwise from north.

Middelberg Guest Farm

The Middelberg Guest Farm borders onto the north-western boundary of the site and consists of Farm 5 (site-adjacent) and Ezelsjacht 171/2. The property is accessed off the R318 with the main entrance from the north. Middelberg is used for secondary (weekend) farming and tourist accommodation and the Middelberg farmstead (171/2) is occupied by the owner over weekends. Two tenured worker households live on the property. Farming activities focus on livestock and vegetable seed cultivation.

The tourism operation is targeted on the Cape Metropolitan market and school groups. The accommodation includes Die Koshuis, a facility with 40 bunk beds and other amenities, is located in the yard (171/2) (Photograph 3.13), a self-catering guest cottage (10 beds) located ~110 m to the west of the farmstead (Photograph 3.14) and small camp site (6 stands) is located in the northernmost corner of the property. Guest flows are mainly over weekends, year-round. Average occupation is 3 out of every 4 weekends throughout the year, but peaks over school holidays.



Photograph 3.13: Die Koshuis on Ezelsjacht 171/2 (Middelberg Guest Farm).



Photograph 3.14: Middelberg guest house on Ezelsjacht 171/2

Key attractions are linked to the 'Karoo farm' setting, natural veld, and the dark, starry night skies. The key viewshed from the yard and cottage is to the south-east, i.e. towards the Khoe site. The nearest turbines are located 4 km and 4.1 km from the Koshuis and cottage, respectively. The owner raised concerns about potential visual and sense of place impacts (Havinga, pers. comm).

Ezelsjacht Guest Farm

Limited information was available for Ezelsjacht Guest Farm. The property consists of three properties, Ratelbosch 149/6, Zout Rivier 170, and Ezelsjacht 171/RE. Two Mainstream renewable energy projects are proposed on the site, namely the 110 MW Ezelsjacht Solar PV and 140 MW Ezelsjacht WEF. The owner is not based in the study area. In as far as could be established, the properties are used for livestock farming and limited irrigated fodder crops and possibly vegetable seed. Tourist accommodation appears to be located on the yard adjacent to the R318. A cottage (Bloekom Huisie) is located 4 km to the north, approximately 650 m east of the proposed Mainstream PV development area.

Leeuwenboschfontein Guest Farm

Leeuwenboschfontein Guest Farm is located near-adjacent to the north-east portion of the site. The ~2 900 ha property straddles the Nougaspoort Road, with the bulk located to the north of the road. The owner resides on the property. Leeuwenboschfontein is a mixed farming/ tourism operation, with tourism focused on Karoo family breakaway tourism. The nature-based activities include fishing, mountain biking, hiking and 4x4 routes. Accommodation facilities are located near the Leeubosfontein farm werf on Leeuwenboschfontein 10/RE just to the north of the Nougaspoort road, approximately 6 km east of the site (Photograph 3.15).

Accommodation facilities consist of 6 separate cottage/ house units (70 guests) and camping sites (160 guests). Visitors are mainly from the Cape Metropolitan area, but also includes travellers on the N1. Visitor flows are year-round, but peaks (full occupancy) over school holidays and long weekends. Leeuwenboschfontein is popular with families and groups such as 4x4 and mountain biking enthusiasts. Day events can draw up to 500 visitors. A small private observatory, Leeuwenboschfontein Observatory, is located across the Nougaspoort road from the werf and is operated as an astronomy club. The facility is open to the public two weekends a month and hosts 2 large events ('star parties') a year. The observatory is

very popular and a major anchor of Leeuwenboschfontein's tourism operation. The astronomy club is currently canvassing adjacent landowners to establish a dark skies area.

The owner of Leeuwenboschfontein has expressed concerns about potential visual impacts on the accommodation cluster and the observatory (aviation lights). The accommodation facilities are considered sensitive to noise disturbance, such as may be generated by turbines. Linked to the activity-based nature of activities, the balance of the property is considered less sensitive to visual and noise disturbances (Roux, pers. comm)



Photograph 3.15: Entrance to Leeubosfontein yard and Leeuwenboschfontein Guest Farm off the Nougaspoort Road

Drie Kuilen Private Nature Reserve

The Drie Kuilen Private Nature Reserve is located to the south of the Nougaspoort Road, approximately 2.4 km east of the site.²¹ The main entrance is along the road (Photograph 3.16). The ~4 200 ha property is used exclusively for conservation and tourism. Game has been reintroduced and internal fencing has been removed. Drie Kuilen is a Cape Nature Stewardship Programme partner and supports research projects and internships on the property. The tourism operation is nature/ wilderness-based and focuses on destination tourism. The accessibly located scenic mountainous terrain, sense of isolation and night skies are considered the key anchoring attractions.

Accommodation facilities at Drie Kuilen include several cottages in different locations as well as a camp site and can accommodate around 70-80 guests. (Photograph 3.17) Activities are nature/ wilderness-based, and include picnic sites, hiking trails, and lookout points. The operation provides 8 full-time employment opportunities. Visitor flows are almost exclusively via the R318. Approximately 60-70% of visitors are from the Cape Metropolitan area. Drie Kuilen is also popular with university groups, photography clubs, and for snow tourism. Occupancy is year-round, but dips in winter, and reaches 80% over peak season. International visitors are mainly associated with spring and summer and include spill-overs from Aquila. The average visitor stay is 2.6 days, but Drie Kuilen also caters to day visitors.

²¹ The western portion of the property is a declared PNR. The property has recently been extended eastwards (Grube, pers. comm), but it is unclear whether the additional area has also been formally declared. Only the original declared area is currently reflected on the DFF&E's Register of Protected Areas.



Photograph 3.16: Main entrance to Drie Kuilen Private Nature Reserve of the Nougaspoort Road



Photograph 3.17: Guest cottages on original Drie Kuilen farm yard

Much of the Drie Kuilen property is screened from the Khoe site by the broken terrain. This includes the main entrance, reception centre, the cottages in various locations, and the camp site. Key exposed receptors are the 'The Top' viewpoint on Moedverlorenberg, approximately 2.8 km east of the nearest turbine, and a nearby planned camping site, 4.8 km to the east of the nearest turbine. The main internal road terminates at the lookout on Moedverlorenberg and the viewpoint provides visitors with spectacular panoramic views of the area. The view from the "The Top" is a key visitor attraction. A picnic site is planned near the lookout. The easternmost cluster of 4 turbines, all within 4.5 km of the viewpoint, have been identified as of specific concern with regard to potential visual, noise and sense of place impacts (Grube, pers. comm).

Eximia Private Game Reserve

The Eximia PGR is located adjacent to the east of the Khoe site. The ~2000 ha estate consists of five properties, of which Farm 34, Krakadouw 56/2, and Farm 209 border directly onto the site. The PGR is located adjacent to the south of the Nougaspoort gravel road and approximately 1.3 km of the access road off the road runs along the site's eastern boundary.

The property was acquired by the current owners in October 2023 for the purpose of establishing a nature/ wilderness-based tourism operation. Eximia PGR is in the process of being developed into a nature reserve and high-end accommodation destination aimed at the local (national) and international markets. The target market is urban-breakaway wilderness tourism, upmarket events/ functions, and nature/ wilderness-based spiritual healing.

Key attractions include the botanically rich veld, sense of quiet and tranquillity, scenic setting, panoramic views from the Waboomsberge, unblemished sunsets, and clear 'Karoo' night skies (Photographs 3.18 and 3.19). A scenic lookout (Fergus' View) is located near Moedverlorenberg (peak) on 56/2. The estate is being rewilded, with internal fences being removed and previously cultivated areas rehabilitated. A Game Management Plan has been drafted for submission to Cape Nature with the intention of introducing endemic and extra-liminal game. The estate is not currently a declared Private Nature Reserve.



Photograph 3.18: Looking north from slopes of Waboomsberge, Kleinkraal yard (Farm 34) in middle ground, and a snow-capped Matroosberg in the distance. Some of the buildings on the yard are planned for conversion into tourist accommodation (Source: Karen Kritzing)



Photograph 3.19: View looking south (towards Montagu) from the Waboonsberge on Krakadouw 56/2 (Source: Karen Kritzinger)

To date, the owners have invested R16 million in land acquisition, putting up game fencing, and on professional fees. Approximately R20.1 million has been budgeted for 2024, mainly on building projects. Project completion is anticipated in 2027, with a total capital investment of R55.9 million. The operation is anticipated to create 20 sustainable employment opportunities. The proposed tourism facilities include a luxury lodge, upmarket events facility and 2 restored historical houses on the periphery of the existing Kleinkraal farm yard (Farm 34), a cluster of 3 upmarket tourist units along the western boundary (Krakadouw 56/2), and the conversion of an existing farmstead on Loopende Rivier 33/RE into a Healing House. Plans for renovating and constructing the events facility and most of the accommodation facilities have been drawn up. New staff housing is also planned.

The entire Eximia property falls within 6.6 km of a turbine. Turbines are proposed ~100 m from the property's western boundary, ~1.7km from the access road, ~500m from the planned Krakadouw cottages, ~800 m from the planned lodge and events facility, ~1.2 km from the historic house, ~1.6 km from Furgus' View lookout, and ~2.9 km from Healing House. The owners have expressed major concerns about potential visual, noise and sense of place impacts. The easternmost cluster of 4 turbines, all within 1.7 km of the estate's western boundary, have been identified as of specific concern (Johan and Karen Kritzinger, pers. comm).

Porcupine Peak Guest Farm

Porcupine Peak Guest Farm is located adjacent to the southern boundary of the site. Both properties, Eendragt 38/RE and Koenies Kraal 55/RE border onto the site. The property is accessed off the R318 on Rooihoogte Pass. Porcupine Peak is a 50: 50 pecan nut farming and tourist accommodation operation. Accommodation consists of 7 cottages and a camping site, all in the vicinity of the Eendracht farm werf on 55/RE and a total of 40 guests can be accommodated (Photograph 3.20).

Porcupine Ridge attracts weekend visitors from the Cape and caters for small events and functions. Guest flows are throughout the year, with dips in winter, and peaks over long weekends and school holidays. Key attractions are considered accessibility, scenic setting, and starry night skies. The estate is located on the upper and mid southern slopes of the Waboonsberge, and it therefore likely largely screened from visual impacts. Nevertheless,

potential visual impacts associated with the band of turbines on the ridge of the Waboomsberge are of concern (McKinnon, pers. comm).



Photograph 3.20: Guest cottages on Porcupine Peak (Eendracht 38/RE)

Langdam Guest Farm

Langdam Guest Farm is located in the Koo south-west of the site. Langdam is a working fruit farm and also provides accommodation in 8 self-catering cottages (up to 35 guests) and safari tents in summer (up to 20 guest). Langdam also caters for events and functions and is a well know wedding venue. The indoor reception venue can accommodate 100 people. Key attractions are considered the scenic setting, starry night skies and snowfalls in winter. Activities offered include hiking, mountain biking and fishing. Other tourist facilities in the Koo often benefit from accommodation spillovers from functions on Langdam (McKinnon, pers. comm). The property is located on the northern slopes of the Langeberg, facing the Waboomsberge ridgeline, and is therefore visually exposed to development near the ridgeline. The nearest turbines are proposed 6.5 km from the Langdam yard. Six turbines are located within 7.5 km of the yard. The owner has objected to the proposed development (Truter, pers. comm).

3.7.6 Other renewable energy facilities

The Khoe WEF site is not located within a renewable energy development zone (REDZ). The DFF&E's Renewable Energy Applications website²² only indicates historic applications (effectively 4 projects) for solar PV REFs are located within a 30 km radius of the centre of the site (Figure 3.12). Historic applications for more SEFs are located >13 km north and north-east of the site, namely for the Touwsrivier CPV and Montague Road PV (>17 km) SEFs.

The only operational REF within a 30 km range of the site, is the Touws River CPV SEF located 15.5 km north of the site. The 36 MW facility became operational in 2014. Not yet reflected on the DFF&E's website, are concurrent applications for the Hugo WEF ~7 km to the north of the Khoe site, and Mainstream's overlapping 110 MW Ezelsjacht PV SEF and 140 MW Ezelsjacht WEF between the Khoe and Hugo sites. In total, 4 REFs, of which 3 WEFs, are proposed along the R318. The WEF proposals straddle the R318, and cover much of the stretch between the old De Doorns-Touwsrivier railway line and Rooihoogte Pass.

²² https://egis.environment.gov.za/renewable_energy

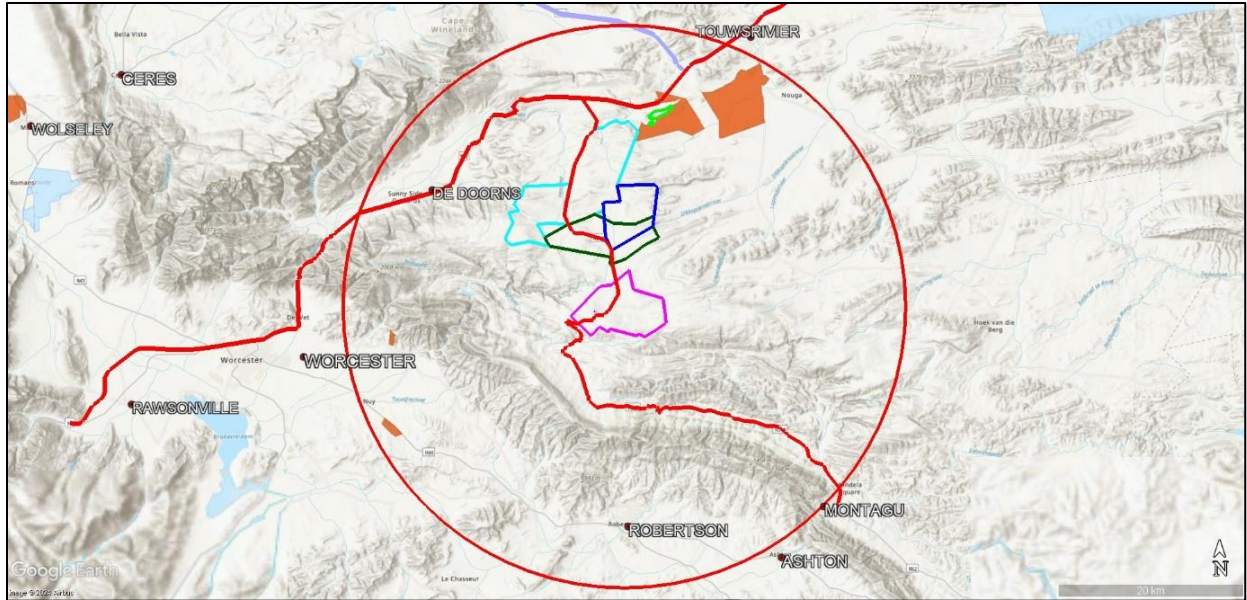


Figure 3.12: Khoe WEF site (pink outline) in relation to historic Solar PV applications (orange fill) and WEF applications (blue fill) within a 30 km radius of the centre of the Khoe site (red circle). Also indicated are the operational Touws River CPV SEF footprint (light green outlines), concurrently proposed Hugo WEF (light blue), and overlapping Mainstream Ezelsjacht WEF and Ezelsjacht PV (dark blue), key roads (red lines) and the Komsberg REDZ boundary (grey line).

SECTION 4: ASSESSMENT OF KEY SOCIAL ISSUES

4.1 INTRODUCTION

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

- Review of project related information.
- Site visit and interviews with key stakeholders.
- Experience of the author with the area and local conditions.
- Experience with similar projects.

The section is divided into the following sections:

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

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.

However, the Western Cape Provincial Spatial Development Framework highlights the importance of the province's landscape and scenic assets and need to protect landscapes and scenic assets from inappropriate development and land use changes. The visual impact of the proposed development on the areas sense of place has been identified as a key issue.

4.3 CONSTRUCTION PHASE SOCIAL IMPACTS

Potential positive impacts

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

Potential negative impacts

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

4.3.1 Creation of local employment, training, and business opportunities

The construction phase will extend over a period of approximately 18-24 months and create in the region of 200-250 employment opportunities that will benefit members from the local communities in the area, including Montagu, De Doorns and Touws River. These opportunities will include opportunities for low, semi and highly workers. Most of the employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. Based on information from similar projects the total wage bill will be in the region of R 25 million (2024 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

The capital expenditure will be approximately R 6 billion (2024 Rand value) and will create opportunities for local businesses. However, given the technical nature of the development most benefits are likely to accrue to companies based in the Cape Metro. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site. The hospitality industry in the area will also benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

Two existing tourism operations in the broader study area, Matroosberg Karoohuisies and Karoo1 Village, have identified opportunities associated with the construction of WEFs in the study area (du Preez, Howard, pers. comm). Opportunities would also be available to Sandvlei and other accommodation providers in the broader study area.

The potential benefits for local communities are confirmed by the findings of the Overview of the IPPPP undertaken by the Department of Energy, National Treasury and DBSA (June 2020). The study found that to date, a total of 52 603 job years²³ have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. To date, 42 355 job years for SA citizens were achieved during construction, which is 26% above the planned 33 707 job years for active projects. These job years are expected to rise further since 23BW4 projects are still in or entering, construction.

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

Black South African citizens, youths and rural or local communities have been the major beneficiaries during the construction phases, as they respectively represent 81%, 43% and

²³ The equivalent of a full-time employment opportunity for one person for one year.

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

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

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 Enhancement	With Enhancement
Extent	Local – Regional (2)	Local – Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	Medium (30)	Medium (44)
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
<p>Enhancement Measures:</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 BWM to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase. • The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project. • Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase. 		

- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business

- The proponent should liaise with the local municipality 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.

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.

Residual impacts: Improved pool of skills and experience in the local area.

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.

Workers are likely to be accommodated in nearby towns of Touws River and De Doorns. As indicated above, 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. However, as indicated above, the availability of suitably qualified workers in the area is likely to be limited. There is therefore likely to be a need to use construction workers from outside the area. Accommodating these workers in Touws River and De Doorns will pose a potential risk to the local community.

While the risks associated with construction workers at a community level are likely to be low with mitigation, 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	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Low (21)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
<p>Recommended enhancement measures:</p> <ul style="list-style-type: none"> • The proponent, in consultation with the local municipality should investigate the option of establishing a Monitoring Committee (MC) to monitor and identify potential problems that may arise 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 SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report and 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 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 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP. • The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site. • The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end. • No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site. 		
<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</p>		

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.

4.3.3 Influx of job seekers

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

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

These issues are similar to the concerns associated with the presence of construction workers and are discussed in Section 4.3.2. However, given the location of the project and relatively short duration of the construction phase the potential for economically motivated in-migration and subsequent labour stranding is likely to be negligible. The risks associated with the influx of job seekers are therefore likely to be low.

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

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	Low (18)	Low (15)
Status	Negative	Negative
Reversibility	No in case of HIV and AIDS	No in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	

Recommended mitigation measures:

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

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

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, farm workers and visitors in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may 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. Based on feedback from interviews with local landowners, stock theft was not identified as a key concern. This is linked to relative isolation and low stock concentrations. Security cameras have also been fitted at various points along the R318 and monitored by a security company (Koo Karoo Farm Safety). However, the risk to stock will need to be considered. 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. Mitigation measures to address these risks are outlined below.

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 (3)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Medium (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Low (24)
Status	Negative	Negative

Reversibility	Yes, compensation paid for stock losses and damage to farm infrastructure etc.	Yes, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	Yes
<p>Recommended mitigation measures:</p> <ul style="list-style-type: none"> • The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. • The developer(s) and local farming community should co-ordinate (and if necessary, upgrade) security arrangements, such as establishment of security cameras at strategic locations. • 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 consider the option of establishing a MC (see above) that includes local farmers and develop a Code of Conduct for construction workers. The MC should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before construction activities commence. • 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 Environmental Management Programme (EMPr) 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 Code of Conduct. All dismissals must be in accordance with South African labour legislation. • It is recommended that no construction workers, except for security personnel, should be permitted to stay over-night on the site. 		
<p>Residual impacts: No, provided losses are compensated.</p>		

Assessment of No-Go option

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

4.3.5 Nuisance impacts associated with construction related activities

The 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. In terms of potential traffic related impacts associated with the construction phase, the transport of wind turbine components has the potential to impact on the N1 and R318. All the properties in the Agterveld and Koo Valley are primarily accessed off the R318. There is no alternative road to Worcester, the nearest large town. Tourism operations along the Nougaspoort Road indicated that guests almost exclusively make use of the R318 to access facilities in the area and not the Touwsrivier-Montagu gravel road. Key use periods are over weekends and public holidays. The R318 also serves as a key link to the N1 for fruit farming

operations in the Koo to transport their produce to markets. The timing of the transport of turbine components will therefore need to be timed to avoid / reduce impacts on the N1 and R318.

The potential noise, dust and safety impacts associated with on-site construction activities will be localised and can be effectively mitigated. The number of potentially sensitive social receptors, such as farmsteads, will also be low due to the sparse settlement patterns and small number of farmsteads in the area.

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

Nature: Potential noise, dust and safety impacts associated with construction related activities		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Short Term (2)	Short Term (2)
Magnitude	Medium (6)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	Medium (30)	Low (15)
Status	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
<p>Recommended mitigation measures</p> <ul style="list-style-type: none"> • Timing of transport of wind turbine components to the site along the N1 and R318 should be timed to avoid / reduce the impact on other road users. This includes avoiding weekends and holiday periods. • The movement of construction vehicles on the site should be confined to existing and agreed access road/s. • Establishment of 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. • Damage to the R318 and internal farm roads that is attributed to the WEF should be repaired before the commissioning of the WEF. • Dust suppression measures should be implemented, such as wetting on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • All vehicles must be road worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. 		
<p>Residual impacts If damage to the R318 and local farm roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.</p>		

Assessment of No-Go option

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

4.3.6 Increased risk of grass fires

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, wildlife, private conservation areas, and farm infrastructure. The risk of grass fires was identified as a key risk during the dry, windy summer months (October-May).

Table 4.6: Assessment of impact of increased risk of grass fires

Nature: Potential loss of livestock, crops, houses, natural veld, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires		
	Without Mitigation	With Mitigation
Extent	Local (4)	Local (2)
Duration	Short term (2)	short term (2)
Magnitude	Moderate due to reliance on agriculture for maintaining livelihoods (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status	Negative	Negative
Reversibility	Yes, compensation paid for stock and crop losses etc.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
<p>Recommended mitigation measures</p> <ul style="list-style-type: none"> • The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences. • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas. • Smoking on site should be confined to designated areas. • Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy 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. • No construction staff, except for security staff, to be accommodated on site overnight. • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors should compensate farmers for damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities. 		
Residual impacts: No, provided losses are compensated for.		

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 crops and grazing. However, experience from other WEFs is that impact on farming operations can be effectively minimised and mitigated by careful planning in the final layout of the proposed WEF and associated components. Based on the findings of the SIA no layout issues were raised by the affected two landowners. Turbine footprints would affect veld used for grazing (32 turbines) and an abandoned cropping area on 38/1 (2). Most turbines are proposed on higher-lying broken terrain of low grazing potential. No land actively used for cropping would be affected. The proposed turbine layout is acceptable to both landowners. Both substation sites are acceptable to the relevant owners. The site on 38/1 is located on an abandoned field, while the site on 37/RE is on a low potential cropping area. Both locations are also considered sufficiently distant from residential/ tourism receptors.

The impact on farmland associated with the construction phase can also be mitigated by minimising the footprint of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. Recommended mitigation measures are outlined below. The timing / phasing on construction activities should where possible also be planned to avoid and or minimise disruption to farming operations. Affected landowners should be involved in planning of timing of construction activities.

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, batching plants, laydown areas, construction camp and the movement of heavy vehicles etc. will damage farmlands and result in a loss of farmlands for grazing.		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Long term-permanent if disturbed areas are not effectively rehabilitated (5)	Short term if damaged areas are rehabilitated (2)
Magnitude	Medium (6)	Minor (2)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (36)	Low (20)
Status	Negative	Negative
Reversibility	Yes, disturbed areas can be rehabilitated	Yes, disturbed areas can be rehabilitated
Irreplaceable loss of resources?	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
Can impact be mitigated?	Yes, however, loss of farmland cannot be avoided	Yes, however, loss of farmland cannot be avoided
Recommended mitigation measures		
<ul style="list-style-type: none"> • An Environmental Control Officer (ECO) should be appointed to monitor the construction phase. • Existing internal roads should be used where possible. If new roads are required, these roads should be rehabilitated on completion of the construction phase. • The footprint associated with the construction related activities (access roads, construction camps, workshop etc.) should be minimised. 		

- All areas disturbed by construction related activities, such as access roads on the site, construction camps 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 included in the EMPr.
- The implementation of the Rehabilitation Programme should be monitored by the ECO.

Residual impacts: Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated.

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 sector.
- Creation of employment opportunities.
- Benefits to the affected landowners.
- Benefits associated with the socio-economic contributions to community development.

Potential negative impacts

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

4.4.1 Improve energy security and support the renewable energy sector

The primary goal of the proposed project is to improve energy security in South Africa by generating additional energy. The proposed WEF also reduces the carbon footprint associated with energy generation. The project should therefore be viewed within the context of the South Africa's current reliance on coal powered energy to meet most of its energy needs, and secondly, within the context of the success of the REIPPPP. However, it should be noted that these benefits are not site dependent and would also be associated with alternative sites.

Improved energy security

South Africa's energy crisis, which started in 2007 and is ongoing, has resulted in widespread rolling blackouts (referred to as load shedding) due to supply shortfalls. The load shedding has had a significant impact on all sectors of the economy and on investor confidence. The mining and manufacturing sector have been severely impacted and will continue to be impacted until such time as there is a reliable supply to energy. Load shedding in the first six months of 2015 was estimated to have cost South African businesses R13.72 billion in lost revenue with an additional R716 million was spent by businesses on backup generators²⁴.

Energy expert, Chris Yelland, has estimated the cost of Stage 1 load shedding resulting in 10 hours of blackouts per day for 20 days a month results in losses of R20 billion per month. Based on this Stage 2 load shedding costs the economy R40 billion per month and Stage 3 is

²⁴ Goldberg, Ariel (9 November 2015). "[The economic impact of load shedding: The case of South African retailers](#)" (PDF). Gordon Institute of Business Science. p. 109

estimated to cost the South African economy R80 billion per month²⁵. A survey of 3 984 small business owners found that 44% said that they had been severely affected by load shedding with 85% stating that it had reduced their revenue, with 40% of small businesses losing 20% or more of revenue during due to load shedding period²⁶.

Impact of a coal powered economy

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

The Greenpeace Report (powering the future: Renewable Energy Roll-out in South Africa, 2013), also notes that within a broader context of climate change, coal energy does not only have environmental impacts, it also has socio-economic impacts. These include acid mine drainage from abandoned mines in South Africa and the risk this poses on the country’s limited water resources.

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 improve energy security and support the renewable sector		
	Without Enhancement	With Enhancement
Extent	Local, Regional and National (4)	Local, Regional and National (5)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	High (8)
Probability	Highly Probable (4)	Definite (5)
Significance	High (64)	High (85)
Status	Positive	Positive
Reversibility	Yes	

²⁵ [The economic consequences of load shedding in South Africa and - Generator King \(genking.co.za\)](http://genking.co.za)

²⁶ "How does load shedding affect small business in SA?". *The Yoco Small Business Pulse (3: Q1 2019):*

Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	Reduced CO ₂ emissions and impact on climate change
Can impact be mitigated?	Yes	
Recommended mitigation measures		
<ul style="list-style-type: none"> • Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members. • Maximise opportunities for local content, procurement, and community shareholding. 		
Residual impacts: Overall reduction in CO ₂ emission, reduction in water consumption for energy generation, contribution to establishing an economically viable commercial renewables generation sector in the Northern Cape and South Africa.		

Assessment of No-Go option

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy.

4.4.2 Creation of employment and business opportunities

The proposed development will create ~ 20 full-time employment opportunities during the operational phase. Based on similar projects the annual operating budget will be in the region of R 24 million (2024 Rand values), including wages.

Table 4.9: Assessment of employment and business creation opportunities

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Enhancement	With Enhancement
Extent	Local and Regional (1)	Local and Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Low (4)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Low (28)	Medium (40)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement Measures:		
Employment		
<ul style="list-style-type: none"> • Where reasonable and practical, the proponent should implement a 'locals first' policy, especially for semi and low-skilled job categories. • Where feasible, 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. 		
Business		

- The proponent should liaise with the BWM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers for the operational phase.

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 operational phase.

Residual impacts: Creation of permanent employment and skills 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 be required to either purchase the land or enter into a rental agreement with the affected landowners for the use of the land for the establishment of the proposed WEF. Farming operations are impacted by droughts and market fluctuations. Any additional source of income therefore represents a benefit for the affected landowner(s). The additional income would assist to reduce the risks to their livelihoods posed by droughts and fluctuating market prices for outputs and farming inputs, such as fuel, feed etc. The additional income would improve economic security of farming operations, which in turn would improve job security of farm workers and benefit the local economy.

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

Nature: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc.		
	Without Enhancement	With Enhancement
Extent	Local (1)	Local (3)
Duration	Long term (4)	Long term (4)
Intensity	Low (4)	Moderate (6)
Likelihood	Probable (3)	Definite (5)
Significance	Low (27)	High (65)
Status	Positive	Positive
Reversibility	Yes	Yes
Can impact be enhanced?	Yes	
Recommended enhancement measures Implement agreements with affected landowners.		
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-year project operational life. For the current portfolio of projects, the average commitment level is 2.2%, which is 125% higher than the minimum threshold level. To date (across seven bid windows) a total contribution of R23.1 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R1.2 billion. Of the total commitment, R18.8 billion is specifically allocated for local communities where the IPPs operate. With every new IPP on the grid, revenues and the respective SED contributions will increase.

SED contributions do therefore create opportunities for local rural communities. However, SED contributions can also be mismanaged. This is an issue that will need to be addressed when managing SED investments.

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

Nature: Benefits associated with support for local community's form SED contributions		
	Without Enhancement	With Enhancement²⁷
Extent	Local and Regional (2)	Local and Regional (3)
Duration	Long term (4)	Long term (4)
Intensity	Low (4)	Moderate (6)
Likelihood	Probable (3)	Definite (5)
Significance	Medium (30)	High (65)
Status	Positive	Positive
Reversibility	Yes	Yes

²⁷ Enhancement assumes effective management of SED contributions.

Can impact be enhanced?	Yes
Recommended enhancement measures <ul style="list-style-type: none"> • The proponents should liaise with the LM 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. 	
Residual impacts: Promotion of social and economic development and improvement in the overall well-being of the community	

Assessment of No-Go option

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

4.4.5 Visual impact and impact on sense of place

The proposed WEF will impact on the areas existing rural sense of place. Based on the findings of the SIA and the Visual Impact Assessment (VIA) (MetroGIS, July 2024) there are several nature reserves and tourist facilities located in the area. The VIA notes that there are three formally protected areas within the study area, namely the Cape Floral Region Protected Area, Touw Local Nature Reserve and Drie Kuilen Private Nature Reserve. The Cape Floral Region is also a World Heritage Site as recognized by UNESCO. The Drie Kuilen PNR offers a variety of activities such as game drives, hikes and overnight accommodation. Numerous non-designated private natures reserves, and guest farms are also located within the study area, namely Aquila Private Nature Reserve to the north, Middelberg guest farm, Leeuwenboschfontein guest farm, Porcupine Peak guest farm and Eximia Private Game Reserve can be found near the centre of the study area. All the reserves and farms offer tourist accommodation facilities and activities. The attraction of these areas is linked to the rural character of the area, including the views and vistas. The greater environment with its wide open, undeveloped landscapes is considered to have a high visual quality.

It is expected that the wind turbine structures will be highly visible from homesteads within this zone, Middelberg Guest Farm, Ezelsjacht Guest farm Exemia Private Nature Reserve, portions of Drie Kuilen Private Nature Reserve, Leeuwenboschfontein Guest farm as well as, from the R318 arterial road that bisects the site. The Khoe WEF is therefore located in an area that can be described as visually sensitive.

The findings of the VIA (MetroGIS, July 2024) are summarized below.

Potential visual impact on sensitive visual receptors (residents and visitors) located within a 5km radius of the wind turbine structures

The operation of the Khoe Wind Energy Facility is expected to have a **very high** visual impact on observers/visitors residing at homesteads and tourist accommodation facilities within a 5km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on sensitive visual receptors (observers travelling along roads) located within a 5km radius of the wind turbine structures

During the entire operational lifespan of the Khoe Wind Energy Facility, it is expected that daily commuters and possible tourists travelling along the various roads within 5km of the wind turbine structures may be negatively impacted upon by the visual exposure to the proposed infrastructure, however brief. It is assumed that the observers travelling along these roads will view the visual intrusion of the turbines in a negative light when compared with the rural and scenic quality of the surrounding landscape. The operation of the Khoe Wind Energy Facility is expected to have a **high** visual impact on observers traveling along the roads within a 5km radius of the wind turbine structures. This includes observers travelling along the R318 and secondary road to the east. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on formally and informally protected areas within 5 km radius of the proposed wind turbines

The Khoe Wind Energy Facility could have a **very high** visual impact on visitors/ tourists to the Drie Kuilen Private Nature Reserve, a formally protected area as well as the following informal/conservation areas: Exemia PNR located within a 5 km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on sensitive visual receptors (residents of homesteads/ tourist accommodation) within a 5 – 10km radius of the proposed WEF

The Khoe Wind Energy Facility could have a **very high** visual impact on residents of (or visitors to) homesteads and tourist accommodation within a 5 - 10km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on sensitive visual receptors (observers travelling along roads) located within a 5-10 km radius of the wind turbine structures

The Khoe Wind Energy Facility could have a **high** visual impact on observers travelling along the R318 and N1 within a 5 - 10km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on sensitive visual receptors (residents of and visitors to homesteads) within 10 – 20km radius of the proposed wind turbine structures

The Khoe Wind Energy Facility could have a **moderate** visual impact on residents of (or visitors to) homesteads/tourist accommodation within a 10 - 20km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on sensitive visual receptors (observers travelling along roads) located within a 10-20 km radius of the wind turbine structures

The Khoe Wind Energy Facility could have a **moderate** visual impact on observers travelling along roads within a 10 - 20km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Potential visual impact on formally protected areas and private nature reserves within 10-20 km from the proposed wind turbines

The Khoe Wind Energy Facility could have a **moderate** visual impact on visitors/ tourists to the Cape Floral Protected area in the southeast (formally protected area) a), located within a 10 - 20km radius of the wind turbine structures. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Night-time impacts

The area immediately surrounding the proposed facility has a relatively low incidence of receptors and light sources, so light trespass and glare from the security and after-hours operational lighting for the facility will have some significance for visual receptors in the study area, especially those located in closer proximity to the wind turbine structures especially within 0-5km and potentially up to 20km. This anticipated lighting impact on residents of homesteads and visitors to tourist accommodation is likely to be of **very high** significance and may be mitigated to **high** especially within 0-5km and potentially up to 10km radius of the wind turbine structures. Similarly, lighting impacts on observers travelling along roads is anticipated to be of **high** significance which may be mitigated to **moderate**.

Ancillary infrastructure

On-site ancillary infrastructure associated with the WEF includes a 132kV substation and collector substation, Battery Energy Storage System (BESS), underground cabling between the wind turbines, internal access roads, gate house, Operation and Maintenance buildings. The anticipated visual impact resulting from this infrastructure is likely to be of **moderate** significance post mitigation. It should be noted that the alternative for the substation would have a lower significance rating owing to the greater distance from the R318 and the closest homestead.

The potential impact on the sense of place of the region

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria, specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.), play a significant role. The greater environment has a rural, undeveloped character and a natural appearance. These generally undeveloped landscapes are considered to have a high visual quality. The landscape sensitivity is considered to be high whereby it has limited to low capacity to accommodate/absorb any change, which in this case would be the proposed wind turbines. The significance of the visual impacts on the sense of place within the region (i.e. beyond a 20km radius of the development and within the greater region) is expected to be of **very high** significance. No mitigation of this impact is possible (i.e. the structures will be visible regardless), but general mitigation and management measures are recommended as best practice.

Conclusion and recommendations

The VIA notes that a risk averse approach has been adopted in so far as to assume that the perception of most (if not all) of the sensitive visual receptors (bar the landowners of the properties earmarked for the development), would be predominantly negative towards the development of a WEF in the region. However, the VIA also notes that that what constitutes a visual impact is subjective and there are also likely to be supporters of renewable energy facilities, such as the proposed Khoe WEF. The VIA indicates that several objections to the proposed Khoe WEF were received by both the EAP and author of the author of the VIA. These

concerns are largely associated with the potential visual impact of the proposed WEF on their places of residence, guest farms/reserves and the overall sense of place of the region.

In terms of overall findings, the VIA notes that overall, the significance of the visual impacts associated with the proposed **Khoe Wind Energy Facility is expected to be very high to high** because of the generally undeveloped character of the landscape and its inability to absorb changes of this magnitude. Additionally, the facility would be visible within an area that contains certain sensitive visual receptors who already consider visual exposure to this type of infrastructure to be intrusive. Such visual receptors include people travelling along the R318 and secondary roads, as well as residents of rural homesteads and tourists passing through or holidaying in the region. In terms of nighttime impacts, the VIA notes that the unblemished night skies are a key attribute to the study areas sense of place and nighttime visual character. Light sources in the area are limited to isolated farm and homesteads and fleeting light from passing cars travelling along the R318 and other secondary roads. Therefore, the introduction of new light sources into a relatively dark night sky, will have an impact on the visual quality of the study area at night. The VIA also notes that the cumulative visual impact of the proposed Khoe Wind Energy Facility, together with the proposed Hugo WEF is expected to be very high with no mitigation possible and therefore is not found to be within acceptable limits.

In conclusion the VIA notes that the greater environment with its wide open, undeveloped landscapes is considered to have a high visual quality. Similarly, the landscape character is rated as having a high sensitivity whereby it has limited to low capacity to accommodate change. Owing to this, the proposed Khoe WEF is expected to significantly alter the visual character of the study area and the turbines will contrast significantly with the typical land use (i.e. eco-tourism establishments). The VIA also notes that several concerns and objections to proposed Khoe WEF have been raised by stakeholders within the region, as communicated by the EAP and Social Impact Specialist. Based on the objections received and the overall lack of support for wind energy facilities in the region, the author of the VIA is of the opinion that the overall very high to high significance of the visual impacts anticipated for the proposed Khoe WEF are considered by most of the stakeholders and decision-makers to be unacceptable and that the statistical majority of objecting stakeholders has been exceeded. If evidence to the contrary surfaces during the progression of the development application, the specialist reserves the right to revise the statement below.

Based on this the author of the VIA is of the opinion that the visual impacts associated with the proposed Khoe Wind Energy Facility has exceeded acceptable limits and is considered fatally flawed from a visual perspective. The author therefore does not support the authorisation of this project owing to the following:

- The overall very high to high visual impacts.
- The very high cumulative impact.
- Majority of the turbines are located on mountain and tall hills rated as having a high sensitivity.
- Majority of the stakeholders are against the project.
- The proposed Khoe WEF is located in significant proximity to sizeable established and planned tourism operations.
- Turbines are located within the buffer zones of protected areas and private nature reserves.
- The proposed Khoe WEF will result in significant loss of sense of place and uniqueness of landscape character.

Table 4.12: Visual impact and impact on sense of place (VIA, Logis 2024)

Nature of Impact: The potential impact on the sense of place of the region.		
	Without mitigation	With Mitigation
Extent	Long distance (1)	Long distance (1)
Duration	Long term (4)	Long term (4)
Magnitude	Very High (10)	Very High (10)
Receptor sensitivity	Very high (10)	Very high (10)
Landscape Character	High (8)	High (8)
Probability	Definite (5)	Definite (5)
Significance	Very High (82)	Very High (82)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No, only best practise measures can be implemented	
Generic best practise mitigation/management measures:		
<u>Planning:</u>		
➤ Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site.		
<u>Operations:</u>		
➤ Maintain the general appearance of the facility as a whole.		
<u>Decommissioning:</u>		
➤ Remove infrastructure not required for the post-decommissioning use.		
➤ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.		
Residual impacts:		
The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.		

Concerns regarding the visual impact of the Khoe WEF on the areas sense of place were raised during interviews conducted as part of the SIA. A summary of the concerns raised by different landowners is provided below.

Based on the findings of the SIA tourism receptors are located to the north, east and south of the site. Depending on location, some of the properties benefit from limited to variable screening by the natural topography. Receptors to the north consist of Middelberg- and Ezelsjacht guest farms. A continuous band of proposed and existing tourism-focused estates are located to the east of the site on both sides of the Nougaspoort Road, namely Eximia Private Game Reserve, Leeuwenboschfontein Guest Farm, Drie Kuilen Private Nature Reserve, and the Gecko Rock Private Nature Reserve further to the east. Smaller receptors include Verloren by Huizen guest accommodation east of Leeuwenboschfontein. The Koo receptors include Porcupine Peak guest farm, and Langdam guest farm and wedding venue. The facilities in the Koo to the south of the site are largely screened by the Waboomsberge, although turbines near the ridgeline may be visible.

Middelberg Guest Farm

Key attractions are linked to the ‘Karoo farm’ setting, natural veld, and the dark, starry night skies. The key viewshed from the yard and cottage is to the south-east, i.e. towards the Khoe site. The nearest turbines are located 4 km and 4.1 km from the Koshuis and cottage, respectively. The owner raised concerns about potential visual and sense of place impacts (Havinga, pers. comm).

Ezelsjacht Guest Farm

Limited information was available for Ezelsjacht Guest Farm. Two Mainstream renewable energy projects are proposed on the site, namely the 110 MW Ezelsjacht Solar PV and 140 MW Ezelsjacht WEF. Tourist accommodation appears to be located on the yard adjacent to the R318. A cottage (Bloekom Huisie) is located 4 km to the north, approximately 650 m east of the proposed Mainstream PV development area.

Leeuwenboschfontein Guest Farm

Leeuwenboschfontein Guest Farm is located near-adjacent to the north-east portion of the site. The owner resides on the property. Leeuwenboschfontein is a mixed farming/ tourism operation, with tourism focused on Karoo family breakaway tourism. The nature-based activities include fishing, mountain biking, hiking and 4x4 routes. Accommodation facilities are located near the Leeubosfontein farm werf on Leeuwenboschfontein 10/RE just to the north of the Nougaspoort road, approximately 6 km east of the site.

Leeuwenboschfontein

Accommodation facilities consist of 6 separate cottage/ house units (70 guests) and camping sites (160 guests). Leeuwenboschfontein is popular with families and groups such as 4x4 and mountain biking enthusiasts. Day events can draw up to 500 visitors. A small private observatory, Leeuwenboschfontein Observatory, is located across the Nougaspoort road from the werf and is operated as an astronomy club. The facility is open to the public two weekends a month and hosts 2 large events ('star parties') a year. The observatory is a major anchor of Leeuwenboschfontein's tourism operation. The owner of Leeuwenboschfontein has expressed concerns about potential visual impacts on the accommodation cluster and the observatory (aviation lights). Linked to the activity-based nature of activities, the balance of the property is considered less sensitive to visual and noise disturbances (Roux, pers. comm)

Drie Kuilen Private Nature Reserve

The ~4 200 ha property is used exclusively for conservation and tourism. Game has been reintroduced and internal fencing has been removed. Drie Kuilen is a Cape Nature Stewardship Programme partner and supports research projects and internships on the property. The tourism operation is nature/ wilderness-based and focuses on destination tourism. The accessibly located scenic mountainous terrain, sense of isolation and night skies are considered the key anchoring attractions. Accommodation facilities at Drie Kuilen include several cottages in different locations as well as a camp site and can accommodate around 70-80 guests. Activities are nature/ wilderness-based, and include picnic sites, hiking trails, and lookout points.

Much of the Drie Kuilen property is screened from the Khoe site by the broken terrain. This includes the main entrance, reception centre, the cottages in various locations, and the camp site. However, the 'The Top' viewpoint on Moedverlorenberg is located approximately 2.8 km east of the nearest turbine, and a nearby planned camping site, 4.8 km to the east of the nearest turbine. The view from the "The Top" is a key visitor attraction. A picnic site is planned near the lookout. The visual impacts associated with the easternmost cluster of 4 turbines that are located within 4.5 km of the viewpoint have been identified as a key concern by the landowner (Grube, pers. comm).

Eximia Private Game Reserve

The 2000 ha Eximia PGR is located adjacent to the east of the Khoe site. The property was acquired by the current owners in October 2023 for the purpose of establishing a nature/ wilderness-based tourism operation and is in the process of being developed into a nature reserve and high-end accommodation destination aimed at the local and international markets. The target market is urban-breakaway wilderness tourism, upmarket events/

functions, and nature/ wilderness-based spiritual healing. Key attractions include the undisturbed scenic views from the Waboomsberge, sense of quiet, clear “Karoo” night skies and botanically rich veld. A scenic lookout (Fergus’ View) is located near Moedverlorenberg on 56/2. To date, the owners have invested R16 million in land acquisition, putting up game fencing, and on professional fees. Approximately R20.1 million has been budgeted for 2024, mainly on building projects. Project completion is anticipated in 2027, with a total capital investment of R55.9 million. The operation is anticipated to create 20 sustainable employment opportunities. The proposed tourism facilities include a luxury lodge, upmarket events facility and 2 restored historical houses on the periphery of the existing Kleinkraal farmyard (Farm 34), a cluster of 3 upmarket tourist units along the western boundary (Krakadouw 56/2), and the conversion of an existing farmstead on Loopende Rivier 33/RE into a Healing House. Plans for renovating and constructing the events facility and most of the accommodation facilities have been drawn up. New staff housing will also be provided.

Turbines are proposed ~100 m from the property’s western boundary, ~1.7km from the access road, ~500m from the planned Krakadouw cottages, ~800 m from the planned lodge and events facility, ~1.2 km from the historic house, ~1.6 km from Fergus’ View lookout, and ~2.9 km from Healing House. The owners have expressed major concerns about potential visual, noise and sense of place impacts. The easternmost cluster of 4 turbines, all within 1.7 km of the estate’s western boundary, have been identified as a key concern (Johan and Karen Kritzinger, pers. comm).

Porcupine Peak Guest Farm

Porcupine Peak Guest Farm is located adjacent to the southern boundary of the site. Accommodation consists of 7 cottages and a camping site, all in the vicinity of the Eendracht farm werf on 55/RE. A total of 40 guests can be accommodated. Porcupine Ridge attracts weekend visitors from the Cape and caters for small events and functions. Key attractions are considered accessibility, scenic setting, and clear night skies. The estate is located on the upper and mid southern slopes of the Waboomsberge and may be screened from visual impacts. Nevertheless, potential visual impacts associated with the band of turbines on the ridge of the Waboomsberge are of concern (McKinnon, pers. comm).

Langdam Guest Farm

Langdam Guest Farm is located in the Koo south-west of the site. Langdam is a working fruit farm and provides accommodation in 8 self-catering cottages (up to 35 guests) and safari tents in summer (up to 20 guest). Langdam also caters for events and functions and is a well know wedding venue. Key attractions are considered the scenic setting, starry night skies and snowfalls in winter. The property is located on the northern slopes of the Langeberg, facing the Waboomsberge ridgeline, and is therefore visually exposed to development near the ridgeline. The nearest turbines are proposed 6.5 km from the Langdam yard. Six turbines are located within 7.5 km of the yard. The owner has objected to the proposed development (Truter, pers. comm).

As indicated above, that while the VIA assumes in its approach that most observers would be predominantly negative towards the development of a WEF in the region, based on the findings of this and other SIAs for wind farms, this not necessarily always the case. While some landowners and travellers may view the turbines in a negative light, for others, wind turbines are not regarded as visually intrusive. The perception of what constitutes a negative visual impact is therefore personal and subjective. However, based on the findings of the SIA, the visual impacts associated with the Khoe WEF were identified as a key concern by several local landowners and a number are strongly opposed to the proposed WEF. These findings support the findings of the VIA and raise concerns about the suitability of the site for the establishment of the a WEF.

The table below assess the significance based on the feedback from stakeholders interviewed as part of the SIA. In addition, the R318 is identified as scenic route in the Langeberg Spatial Development Framework (SDF). In terms of landscapes, the SDF also highlights the importance of:

- Preserving the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promoting and protecting the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promoting tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

While the SDF notes that opportunities for alternative energy sources, including solar and wind energy, should be identified, it states that they should only be promoted in viable zones.

Table 4.13: Assessment of potential visual impact based on comments from local landowners

Nature: Visual impact associated with the proposed facility and associated infrastructure and the potential impact on the area’s rural sense of place.		
	Without Mitigation	With Mitigation
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	High (8)	High (8)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	High (60)	High (60)
Status	Negative	Negative
Reversibility	Yes, WEF components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation		
<ul style="list-style-type: none"> • The recommendations contained in the VIA should also be implemented. • Install radar activated civil aviation light system. 		
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

A literature review was undertaken as part of the SIA. It should be noted that the review does not constitute a property evaluation study and merely seeks to comment on the potential impact of wind farms on property values based on the findings of studies undertaken

overseas. The assessment rating is based on the findings of the review. In total five articles were identified and reviewed namely:

- Stephen Gibbons (April 2014): Gone with the wind: Valuing the Visual Impacts of Wind turbines through house prices. London School of Economics and Political Sciences & Spatial Economics Research Centre, SERC Discussion Paper 159.
- Review of the Impact of Wind Farms on Property Values, Urbis Pty Ltd (2016): Commissioned by the Office of Environment and Heritage, NSW, Australia.
- Yasin Sunak and Reinhard Madlener (May 2012): The Impact of Wind Farms on Property Values: A Geographically Weighted Hedonic Pricing. School of Business and Economics / E.ON Energy Research Center, RWTH Aachen University. Model Working Paper No. 3/2012.
- Martin D. Heintzelman and Carrie M. Tuttle (March 3, 2011): Values in the Wind: A Hedonic Analysis of Wind Power Facilities. Economics and Financial Studies School of Business, Clarkson University.
- Ben Hoen, Jason P. Brown, Thomas Jackson, Ryan Wiser, Mark Thayer and Peter Cappers (August 2013): A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States. Ernest Orlando Lawrence Berkeley National Laboratory.

Based on the findings of the literature review the potential impact of WEFs on rural property values is likely to be low, specifically for farms that are farmed as productive farms. However, there are several nature reserves and tourist facilities in the area. The attraction of these areas is linked to the rural character of the area, including the views and vistas. The potential for the proposed WEF to visually impact on a number of these facilities and their associated property values therefore exists. As indicated above, the findings of the VIA (Logis, May 2024) indicate that the visual impact of the Khoe WEF on the areas sense of place will be **Very High**.

A Tourism Impact Assessment was undertaken by Urban Econ as part of the EIA (Urban Econ, 2024). The study also assessed the potential impact on property and land values in the affected area, including the impact on game farming operations. A detailed literature (international and local) was undertaken as part of the study. The study notes that the review of international literature corroborates the absence of direct linkages between wind farm developments and property prices with various studies confirming that there is no long-term impact of wind farms on property values. Based on the local review, the Urban Econ study notes that in summary, the introduction of wind farm developments did not negatively impact property sales in the specified areas. While farm sales remained stable, there was a noticeable increase in the average sale price. The presence of wind farms did not deter buyers, instead, it may have motivated them, as evidenced by the upward trend in both sales and prices. Overall, there is no clear indication of a negative correlation between wind farm development timing and property sales in this section. Based on the findings of the study the impact of wind farms on local property values during the operational phase was rated as **Low Positive** (with and without enhancement). Property agents interviewed as part of the study noted that there was an increase in the price of agricultural property linked to the potential to rent out portions to the IPP companies. The same trends continued where wind farms are installed.

However, given the location of the proposed Khoe WEF and proximity of established nature-based tourism activities, the potential impact on property values of the directly affected properties is likely to be **Medium Negative**. This represents a negative externality for which the owners of these facilities may potentially suffer a financial loss. Effective mitigation would require the developer to compensate the affected landowners for the impact. In the event the Khoe WEF is approved, the developer should liaise with the owners of the directly affected facilities to assess the potential impact of the Khoe WEF on property values and considered the option of compensation. Based on the findings of the SIA the potentially affected

properties / establishments include Middelberg Guest Farm, Leeuwenboschfontein Guest Farm, Leeuwenboschfontein, Drie Kuilen Private Nature Reserve, Eximia Private Game Reserve, Langdam Guest Farm, and Porcupine Peak Guest Farm (see above).

Table 4.14: Assessment of potential impact on value of visually affected properties

Nature: Potential impact of the WEF on property values		
	Without Mitigation	With Enhancement / Mitigation
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (27) ²⁸
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Mitigation		
<ul style="list-style-type: none"> • The recommendations contained in the VIA should also be implemented. • The developer of the Khoe WEF should liaise with the owners of the affected operations to assess the potential impact of the WEF on property values and the option of compensation. An independent property valuator should be appointed at the cost of the developer to undertake the assessment. • Install radar activated civil aviation light system. 		
Residual impacts: Linked to visual impact on sense of place.		

Assessment of No-Go option

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

4.4.7 Potential impact on tourism

A review of international literature in the impact of wind farms was undertaken as part of the SIA. Three articles were reviewed, namely:

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

Based on the findings of the literature review the potential impact of WEFs on rural property values is likely to be low, specifically for farms that are farmed as productive farms. However,

²⁸ Assumes affected property owners are fully compensated to their satisfaction for impact on property values.

there are several nature reserves and tourist facilities in the area. The attraction of these areas is linked to the rural character of the area, including the views and vistas. The findings of an international literature review undertaken by Urban Econ (2024) found that there is a difference between public attitude towards clean energy in general, and opposition for development of wind energy facilities in localities that are endowed with scenic landscapes used to attract visitors to the area. The potential for the proposed Khoe WEF to visually impact tourism related activities in the study area therefore exists. The attraction of these areas is likely to be linked to the rural character of the area, including the views and vistas. As indicated above, the findings of the VIA (Logis, May 2024) indicate that the visual impact of the Khoe WEF on the areas sense of place will be **Very High**.

A Tourism Impact Assessment was undertaken by Urban Econ as part of an EIA for the Angora WEF located to the southwest of Richmond in the Northern Cape. Based on the findings of the study the impact on a tourism facility that was visually exposed to the Angora WEF was rated as **Medium Negative** with and without mitigation. Based on the findings of the SIA it is reasonable to assume that this rating would also apply to the properties affected by the Khoe WEF. The Khoe WEF therefore has the potential to impact negatively on existing tourism operations in the study area that are visually exposed to the wind turbines. This represents a negative externality for which the owners of these facilities may potentially suffer a financial loss.

In addition, the R318 is identified as scenic route in the Langeberg Spatial Development Framework (SDF). In terms of landscapes, the SDF also highlights the importance of:

- Preserving the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promoting and protecting the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promoting tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

While the SDF notes that opportunities for alternative energy sources, including solar and wind energy, should be identified, it states that they should only be promoted in viable zones.

In the event the Khoe WEF is approved, the developer should liaise with the owners of the directly affected facilities to assess the potential impact of the Khoe WEF on future tourism operations and considered the option of compensation if a direct impact can be established. This would include monitoring occupancy levels pre and post the establishment of the Khoe WEF to assess if there are any marked changes that could be attributed to the establishment of the Khoe WEF and associated visual impacts. The impact on tourism should also assess the impact on proposed tourism developments that would be impacted by the proposed WEF. Based on the findings of the SIA these include Middelberg Guest Farm, Leeuwenboschfontein Guest Farm, Leeuwenboschfontein, Drie Kuilen Private Nature Reserve, Eximia Private Game Reserve, Langdam Guest Farm, and Porcupine Peak Guest Farm (see above).

Two assessment ratings have been prepared, namely one for the potential impact of the WEF on local tourism operations that are visually impacted by the Khoe WEF and one for the impact of the WEF on general tourism in the study area.

Table 4.15: Impact on local tourism operations visually impacted by WEF

Nature: Potential impact of the WEF on tourism operations that are visually impacted		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (27) ²⁹
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> The recommendations contained in the VIA should be implemented. The developer of the Khoe WEF should liaise with the owners of the affected operations to assess the potential impact of the Khoe WEF on future tourism operations and option of some form of compensation if a direct impact can be established. 		
Residual impacts: Linked to visual impact on sense of place.		

Table 4.16: Impact on tourism in the region

Nature: Potential impact of the WEF on local tourism in the area		
	Without Mitigation	With Mitigation
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (16)	Low (16)
Status	Negative	Negative
Reversibility	Yes	Yes
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> The recommendations contained in the VIA should be implemented. 		
Residual impacts: Linked to visual impact on sense of place.		

²⁹ Assumes affected property owners are fully compensated to their satisfaction for impact on tourism operations (current and proposed).

Assessment of No-Go option

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

4.5 CUMULATIVE IMPACT ON SENSE OF PLACE

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

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

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

The establishment of the WEF and other WEFs in the area will create the potential for combined and sequential visibility impacts. The findings of the VIA (Logis, 2024) note that the study area is not located within a REDZ, and as such very limited renewable energy facilities can be found within a 35 km radius. No other wind energy facilities have been authorized within a 35 km radius; however, three (3) solar PV energy facilities have been approved, namely Sanral PV SEF to the northwest and Touwsrivier and Montague Road Solar PV SEFs to the northeast.

The proposed Khoe WEF is also one half of a larger wind energy cluster consisting of another proposed WEF to the south, namely the Hugo WEF. The cumulative visual impact of the proposed Khoe WEF, together with the proposed Hugo WEF is expected to be **Very High**, depending on the observer's sensitivity to wind turbine structures. The VIA notes that owing to the sensitivity of the landscape, the high visual quality and the potential visual impacts on sensitive visual receptors, the cumulative visual impact is not considered to be within acceptable limits.

Table 4.17 reflects the findings of the VIA (Logis, 2024). These findings are supported by the SIA. In this regard the authorities will need to consider the overall suitability of establishing large wind farms to the south of the N1 in an area that is visually sensitive and has a number of established nature reserves and associated eco-tourism facilities. The location and operation of these facilities are linked to the areas largely undisturbed scenic landscape and views. The development of renewable energy facilities in the area to the south of the N1 also represents and spill over from the Komsberg REDZ which is located to the north of the N1. From a long-term planning perspective this may not be ideal, specifically given the environmental qualities of the area to the south of the N1. In this regard the Western Cape

Provincial Spatial Development Framework (WCSDf) highlights the importance of the provinces landscape and scenic assets, noting that they underpin the tourism economy. The WCPSDF identifies the mountain ranges belonging to the Cape Fold Belt together with the coastline as the most significant in scenic terms and underpin the WCP’s tourism economy and notes that several scenic landscapes of high significance are under threat, including landscapes under pressure for large scale infrastructural developments such as **wind farms**.

Table 4.17: Cumulative impacts on sense of place and the landscape (VIA, Logis 2024)

Nature of Impact: The potential cumulative visual impact of wind farms on the visual quality of the landscape.		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the Hugo and Khoe WEFs
Extent	Medium distance (2)	Medium distance (2)
Duration	Long term (4)	Long term (4)
Magnitude	Very High (10)	Very high (10)
Receptor sensitivity	Very high (10)	Very high (10)
Landscape Character	High (8)	High (8)
Probability	Definite (5)	Definite (5)
Significance	Very High (85)	Very High (85)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Reversible (1)	Reversible (1)
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	
Mitigation measures: N.A.		
Residual impacts: The visual impact will be removed after decommissioning, provided the WEF infrastructure is removed, and the area rehabilitated. Failing this, the visual impact will remain.		

Assessment of No-Go option

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

4.6 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The objective will be to source as many low and semi-skilled workers for the construction phase from the LM and BVM. This will reduce the pressure on local services and accommodation in the area. For a single WEF project ~ 200-250 workers may require accommodation. In the event of the construction phase for 2 projects overlapping, the total number of workers requiring accommodation would be between 400 and 500. The potential pressure on local services will depend on the number of locally based contractors and workers that are employed during the construction phase.

The potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and associated renewable energy projects in the area. These benefits will create opportunities for investment in the area, including the opportunity to up-grade and expand existing services and the construction of new houses. Socio-economic development (SED) contributions also represent an important focus of the REIPPPP and is aimed at ensuring that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. The proposed WEF is also

required to contribute a percentage of projected revenues accrued over the 20-year period to SED. This will provide revenue that can be used by the LM to invest in up-grading local services where required. It should also be noted that it is the function of national, provincial, and local government to address the needs created by development and provide the required services. The additional demand for services and accommodation created by the establishment of development renewable energy projects should therefore be addressed in the Integrated Development Planning process undertaken by the LM.

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 LM and BVM 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 (1)	Local and regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Low (27)	Medium (30) ³⁰
Status (positive/negative)	Negative	Negative
Reversibility	Yes. WEF components and other infrastructure can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation: The proponent should liaise with the LM to address potential impacts on accommodation and local services.		

Assessment on No-Go option

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

4.7 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of renewable energy facilities and associated infrastructure, including the proposed WEF, will also create several socio-economic opportunities for the LM and BVM. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities. The potential cumulative benefits are associated with both the construction and operational phase of renewable energy projects and associated infrastructure and extend over a period of 20-25 years. Steps must however be taken to maximise employment opportunities for members from the local communities in the area and support skills development and training programmes.

³⁰ With effective mitigation and planning, the significance will be Low Negative.

However, as indicated above, the authorities will need to consider the overall suitability of establishing large wind to the south of the N1 in an area that is visually sensitive and has several established nature reserves and associated eco-tourism facilities.

Table 4.19: Cumulative impacts on local economy

Nature: The establishment of renewable energy facilities and associated projects, such as the WEF, in the BWM 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 (1)	Local and regional (3)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	High (8)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Medium (36)	High (60)
Status (positive/negative)	Positive	Positive
Reversibility	Yes. WEF components and other infrastructure can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation: The proposed establishment of suitably sited renewable energy facilities and associated projects, such as the proposed WEF, within the BWM should be supported.		

Assessment of No-Go option

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

4.8 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 commissioning³¹. The decommissioning phase is therefore likely to create additional construction type jobs, as opposed to the jobs losses typically associated with decommissioning. The number of people employed during the operational phase will be in the region of 20. Given the low number of people employed during the operational phase the decommissioning of the facility will not have a significant negative social impact on the local community. The potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme.

³¹ There is also a possibility that the existing wind turbines may be replaced with new, more efficient turbines at the end of the first 20-year contract period. This would create additional employment opportunities and ensure that the existing operational phase jobs are maintained.

The decommissioning phase will also create employment opportunities. This will represent a positive impact. These jobs will, however, be temporary.

Table 4.20: 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 (4)	Local (2)
Duration	Short term (2)	short term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	Medium (36)	Low (24)
Status	Negative	Negative
Reversibility	N/A	
Irreplaceable loss of resources?	No	No
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. 		
Residual impacts No, provided effective retrenchment package.		

Assessment on 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 generate additional energy and improve energy security. 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. However, the benefits associated with the proposed development are not site dependent.

Table 4.21: Assessment of no-development option

Nature: The no-development option would result in the lost opportunity for South Africa to improve energy security and assist to support with the development of clean, renewable energy		
	Without Mitigation ³²	With Mitigation ³³
Extent	Local-International (4)	Local-International (4)
Duration	Long term (4)	Long term (4)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	Moderate (56)	Moderate (56)
Status	Negative	Positive
Reversibility	Yes	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	
Can impact be mitigated?	Yes	
Enhancement: The proposed WEF should be developed, and the 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.		

³² Assumes project is not developed.

³³ Assumes project is developed.

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

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

- A review of key planning and policy documents pertaining to the area.
- A review of social and economic issues associated with similar developments.
- Site visit and interviews with key stakeholders
- A review of relevant literature on social and economic impacts.
- 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 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.

However, the Western Cape Provincial Spatial Development Framework (WCPSDF) highlights the importance of the Province's landscape and scenic assets, noting that they underpin the tourism economy. The WCPSDF identifies the mountain ranges belonging to the Cape Fold Belt together with the coastline as the most significant in scenic terms and underpin the WCP's tourism economy and notes that several scenic landscapes of high significance are under threat, including landscapes under pressure for large scale infrastructural developments such as **wind farms**. The Langeberg Spatial Development Framework also identifies the R318 as scenic route highlights the importance of:

- Preserving the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promoting and protecting the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promoting tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

The development of large-scale wind farms in the area to the south of the N1 may therefore not be ideal, specifically given the scenic and environmental qualities of the area.

5.2.2 Construction phase impacts

The key social issues associated with the construction phase include:

Potential positive impacts

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

The construction phase will extend over a period of approximately 18-24 months and create in the region of 200-250 employment opportunities. Members from the local communities in Ermelo and the LM would qualify for some of the low skilled and semi-skilled employment opportunities and a number of skilled opportunities. The Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members from the local community. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a social benefit. The total wage bill will be in the region of R 25 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 LM and BVM. The capital expenditure associated with the construction phase will be approximately R 8 billion (2023 Rand value). However, given the technical nature of the project most benefits will accrue to companies based in the Cape Metro. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers.

Potential negative impacts

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

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

Table 5.1: Summary of social impacts during construction phase

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

5.2.3 Operational phase impacts

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

Potential positive impacts

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

The proposed project will supplement South Africa’s energy and assist to improve energy security. In addition, it will also reduce the country’s reliance on coal as an energy source. This represents a positive social benefit. However, it should be noted that the benefits are not site dependent.

Potential negative impacts

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

Concerns relating the potential visual impact of the proposed Khoe WEF on local properties and tourist related activities were raised by several affected property owners. The overall finding of the VIA (Logis July 2024) indicate that the proposed Khoe WEF will have a **Very High** visual impact on areas sense of place. Based on this finding the author of the VIA is of the opinion that the visual impacts associated with the proposed Khoe WEF exceeded acceptable limits and is considered fatally flawed from a visual perspective. The development of the Khoe WEF is therefore not supported by the VIA.

The findings of the SIA support the findings of the VIA. Based on the findings of the SIA the significance of the visual impact associated with the Khoe WEF was rated as **High Negative** with and without mitigation.

The significance of the impacts associated with the operational phase are summarised in Table 5.2.

Table 5.2: Summary of social impacts during operational phase

Impact	Significance No Mitigation/ Enhancement	Significance With Mitigation/ Enhancement
Establishment of infrastructure to improve energy security and support renewable sector	Medium (Positive)	High (Positive)
Creation of employment and business opportunities	Low (Positive)	Medium (Positive)
Generate income for local landowners	Low (Positive)	Medium (Positive)
Benefits associated with socio-economic contributions to community development	Medium (Positive)	High (Positive)
Visual impact on sense of place (VIA)	Very High (Negative)	Very High (Negative)
Visual impact and impact on sense of place (SIA)	High (Negative)	High (Negative)
Impact on property values of visually affected properties	Medium (Negative)	Low (Negative) ³⁴
Impact on tourism (affected properties)	Medium (Negative)	Low (Negative) ³⁵
Impact on tourism: Region	Low (Negative)	Low (Negative)

5.2.4 Assessment of cumulative impacts

Cumulative impact on sense of place

The potential visual impact of the proposed WEF and associated infrastructure on the areas sense of place is likely to **Very High Negative**.

Cumulative impact on local services and accommodation

The significance of this impact with mitigation was rated as **Low Negative**.

Cumulative impact on local economy

The significance of this impact with enhancement was rated as **Medium-High Positive**.

5.2.5 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 was assessed to be Low (positive).

³⁴ Assumes affected property owners are fully compensated to their satisfaction for impact on property values.

³⁵ Assumes affected property owners are fully compensated to their satisfaction for impact on tourism activities.

5.2.6 Assessment of no-development option

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement its current energy needs with clean, renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a negative social cost. However, the benefits associated with the WEF are not site dependent and would also be associated with an alternative site.

5.3 CONCLUSION

The findings of the SIA indicate that proposed Khoe WEF project will create several social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy that will improve energy security in South Africa and contribute towards reducing the country's carbon footprint. However, the benefits associated with the WEF are not site dependent and would also be associated with an alternative site.

Based on the findings of the VIA (MetroGIS) the Khoe WEF will have a **Very High Negative** Impact on the area's sense of place. The cumulative impacts on the area's sense of place will also be **Very High Negative**. Effective mitigation is not possible. Based on this finding the visual impacts associated with the proposed Khoe WEF exceed acceptable limits and are considered as a fatal flaw from a visual perspective. The development of the Khoe WEF is therefore not supported by the VIA. The findings of the SIA support the findings of the VIA. Given the area's visual sensitivity and number of established nature reserves and associated eco-tourism facilities, the Khoe WEF is located in an area that is not regarded as suitable for the establishment of a large-scale wind energy facility.

Statement and reasoned opinion

Based on the findings of the SIA the development of the proposed Khoe WEF is not supported. The suitability of establishing large WEFs, including the proposed Khoe WEF, in the area to the south of the N1 is questioned. The development of renewable energy facilities in the area to the south of the N1 represents a spillover from the Komsberg REDZ located to the north of the N1. From a long-term planning perspective this is not ideal, specifically given the environmental and scenic qualities of the area. In this regard the Western Cape Provincial Spatial Development Framework highlights the importance to the Province's landscape and scenic assets and threat posed by large scale infrastructural developments such as wind farms. The Langeberg Spatial Development Framework also identifies the R318 as scenic route highlights the importance of:

- Preserving the character of the Langeberg, inclusive of the unique landscape of winelands, mountains, and agriculture.
- Promoting and protecting the landscape (natural and heritage) features of the Langeberg as part of the tourism attraction.
- Promoting tourism to develop sensitively and contribute to the protection of the landscape and heritage landscape.

It is also important to note that the benefits associated with the WEF are not site dependent and would also be associated with an alternative site. This point is relevant given the environmental and social sensitivity of the study area.

ANNEXURE A

INTERVIEWS

- Bester, Mr Reon (telephonic 2024-04-16). Ratelbosch 149/1.
- Brunings, Ms. Tracey (e-mail 2024-04-19). Manager Town Planning, Langeberg Local Municipality.
- De Kock, Mr Hennie (2024-03-28). Kalkoenvlakte 6, Eendragt 38/1, Eendragt 38/2, Eendragt 38/11.
- Deale, Mr Jonathan (telephonic 2024-04-10). Gecko Rock Private Nature Reserve.
- Du Plessis, Mr Christiaan (2024-03-28). Touwsrivier Heritage Conservation Society.
- Du Preez, Mr Dawie (telephonic 2024-04-17). Helpmekaar 148/RE; Matroosberg siding.
- Esterhuyse, Ms. Melanie (telephonic 2024-04-16). Hex River Valley Tourism.
- Falck, Mr Greame (e-mail 2024-04-11). Ratelbosch 149/6, Zout Rivier 170, Ezelsjacht 171/2.
- Grube, Ms Lina (2024-03-28). Drie Kuilen Private Nature Reserve.
- Havinga, Mr Heinn (2024-03-27; e-mail 2024-03-27). Middelberg 5, Ezelsjacht 171/2 (Middelberg Guest Farm).
- Hugo, Mr Marius (e-mail 2024-04-11). Oudekraal 145, Stinkfonteins Berg 147, Stinkfontein 172/RE, Farm 173, Farm 174/2.
- Kritzinger, Mr Johan (2024-03-27; e-mail 2024-04-03). Krakadouw 56/2, Farm 34, Loopende Rivier 33/RE, Loopende Rivier 33/2(Eximia Private Game Reserve).
- Kritzinger, Ms Karen (2024-03-27). Krakadouw 56/2, Farm 34. Loopende Rivier 33/1 (Eximia Private Game Reserve).
- Le Roux, Mr Alex (2024-03-26). Eendragt 37/RE, Farm 193.
- Le Roux, Mr Johan (2024-03-26). Eendragt 37/RE, Farm 193.
- Le Roux, Ms Engela (telephonic 2024-04-10). Eendragt 256 (Kango Guest House).
- McKinnon, Ms Tatiana (2024-03-27). Eendragt 38/RE, Farm 55 (Porcupine Peak Guest Farm).
- Pieters, Ms Carisa (telephonic 2024-04-17). Spatial Planning: Breede Valley Local Municipality.
- Reitz, Mr Marius (comment on EIA Registration and Comment sheet,2024-04-14). Leeuwenboschfontein Observatory.
- Roux, Mr Johan (telephonic 2024-04-10; 2024-04-17). Leeuwenboschfontein Guest Farm.
- Rubinstein, Mr Howard (e-mail 2024-04-15; telephonic 2024-04-16). Karoo1 Village.
- Short, Ms Lena (2024-03-28). Drie Kuilen Private Nature Reserve.
- Short, Mr Stefan (2024-03-28). Drie Kuilen Private Nature Reserve.
- Truter, Mr Garth (telephonic 2024-04-10; comment on EIA Registration and Comment sheet, 2024-04-22). Langdam Guest Farm.
- Uys, Mr Dirk (2024-03-27). Helpmekaar 148/9.
- Van der Westhuizen, Ms Christelle (2024-03-28). Touwsrivier Tourism.
- Van Eeden, Mr Andre (telephonic 2024-04-16; 2024-04-17). Helpmekaar 148/1.
- X, Mr Lynton (telephonic 2024-03-25). Farm 804/RE (former Hartebeeskraal Hunting).

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- White Paper on Renewable Energy (November 2003).
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- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- National Development Plan (2011).

- MetroGIS, VIA Khoe WEF (2024).
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- National Infrastructure Plan.
- Western Cape Provincial Spatial Development Framework (2014).
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- Langeberg Municipality Spatial Development Framework (2023).
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- https://egis.environment.gov.za/protected_and_conservation_areas_database
- <https://geckorock.co.za/>
- <https://gis.elsenburg.com/apps/cfm/#>
- <https://kamagusafarilodge.com/>
- <https://porcupinepeak.co.za/>
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- <https://www.middelbergfarm.com/>
- <https://www.montagu-ashton.info/listing/sandvlei-kuier-huis/>
- <https://www.njalosafari.com/>
- <https://www.route-62-info.co.za/routes>

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

Direct, indirect and cumulative impacts associated with the projects must be assessed in terms of the following criteria:

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

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

$$S=(E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

- < 30 points: Low (i.e. where this impact would not have a direct influence on the acceptability of the development footprint, or the decision process to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the acceptability of the development footprint, or the decision process to develop in the area unless it is effectively mitigated),
- 60-90 points: High (i.e. where the impact must have an influence on the acceptability of the development footprint, or the decision process to develop in the area).
- 90 points: Very High (i.e. where the impact must have an influence on the acceptability of the development footprint, or the decision process to develop in the area, and may constitute a fatal flaw where motivated by a specialist consultant)

ANNEXURE C

Tony Barbour

ENVIRONMENTAL CONSULTING

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

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

EDUCATION

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

EMPLOYMENT RECORD

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

LECTURING

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

RELEVANT EXPERIENCE AND EXPERTISE

Tony Barbour has undertaken in the region of 260 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition, he is the author of the Guidelines for undertaking SIA's as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

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

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

ANNEXURE D

The specialist declaration of independence in terms of the Regulations_

I, Tony Barbour _____, declare that -- General

declaration:

I act as the independent specialist in this application;

I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

I declare that there are no circumstances that may compromise my objectivity in performing such work;

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

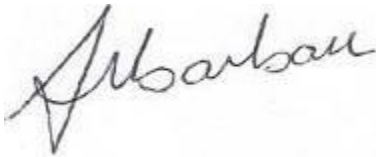
I will comply with the Act, Regulations and all other applicable legislation;

I have no, and will not engage in, conflicting interests in the undertaking of the activity;

I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;

all the particulars furnished by me in this form are true and correct; and

I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the specialist:

Tony Barbour Environmental Consulting and Research

Name of company (if applicable):

23 July 2024

Date: