SOCIAL ASSESSMENT

BASELINE SCOPING REPORT

HUGO WIND ENERGY FACILITY

WESTERN CAPE PROVINCE

NOVEMBER 2023

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 360 MW Hugo Wind Energy Facility (WEF) located ~ 14km east of De Doorns in the Breede Valley Municipality (BVM) 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. This report contains the findings of the Scoping Level SIA for the proposed project.

SUMMARY OF KEY FINDINGS

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

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

The findings of the Social Baseline Scoping Report are based on a review of relevant documents and the author's experience with undertaking SIAs for other renewable energy projects in the study area. The issues will be confirmed and assessed during the Assessment Phase of the EIA process.

POLICY AND PLANNING ISSUES

The development of renewable energy is strongly supported at a national, provincial, and local level. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to and support renewable energy. The development of renewable energy is also supported by key provincial policies.

CONSTRUCTION PHASE

The key social issues associated with the construction phase include:

Potential positive impacts

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

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 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 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.

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

There are several nature reserves and tourist facilities in the area. The attraction of these areas is likely to be 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 therefore exists. The potential impact on these operations will need to be assessed during the Assessment Phase. The significance of the impacts associated with the operational phase are summarised in Table 2.

Table 2: Summary of social impacts during operational phase

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

CUMULATIVE IMPACTS

Cumulative impact on sense of place
The establishment of the proposed WEF and other renewable energy facilities in the area will create the potential for combined and sequential visibility impacts. The significance will be informed by the findings of the VIA.

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

Cumulative impact on local economy
The significance of this impact with enhancement was rated as **Moderate Positive**.

The significance ratings will be confirmed during the assessment phase.

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 likely to be Low (negative).

NO-DEVELOPMENT OPTION

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

CONCLUSION

The findings of the Social Scoping study indicate that the proposed Hugo WEF project will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy that will improve energy security in South Africa and contribute towards reducing the countries carbon footprint.

The potential negative impacts associated with the construction are likely to be **Low Negative** with mitigation. However, the proposed WEF is located in an area that is likely to be visually sensitive and has the potential to impact negatively on a number of nature reserves and tourist facilities in the area. The attraction of these areas is likely to be linked to the rural character of the area, including the views and vistas. The potential impact on these operations will need to be assessed during the Assessment Phase.

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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 *curriculum vitae*;	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 D
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1, Section 1.2
(cA) an indication of the quality and age of base data used for the specialist report;	Section 1.2, Section 3
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Interviews will be undertaken during Assessment Phase
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.2, Annexure B
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4
(g) an identification of any areas to be avoided, including buffers;	Section 4
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 3
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.4,
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment, or activities;	Section 4
(k) any mitigation measures for inclusion in the EMPr;	Mitigation measures will be identified during the Assessment Phase
(l) any conditions for inclusion in the environmental authorisation;	N/A Scoping Report
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A Scoping Report
(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;	N/A Scoping Report
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report	Interviews will be undertaken during Assessment Phase
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Interviews will be undertaken during Assessment Phase

(q) any other information requested by the competent authority	N/A
Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	Comply with the Assessment Protocols that were published on 20 March 2020, in Government 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.

ACRONYMS

BESS	Battery Energy Storage System
BVM	Breede Valley Municipality
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
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 360 MW Hugo Wind Energy Facility (WEF) located ~ 14km east of De Doorns in the Breede Valley Municipality (BVM) in the Western Cape Province (Figure 1.1).

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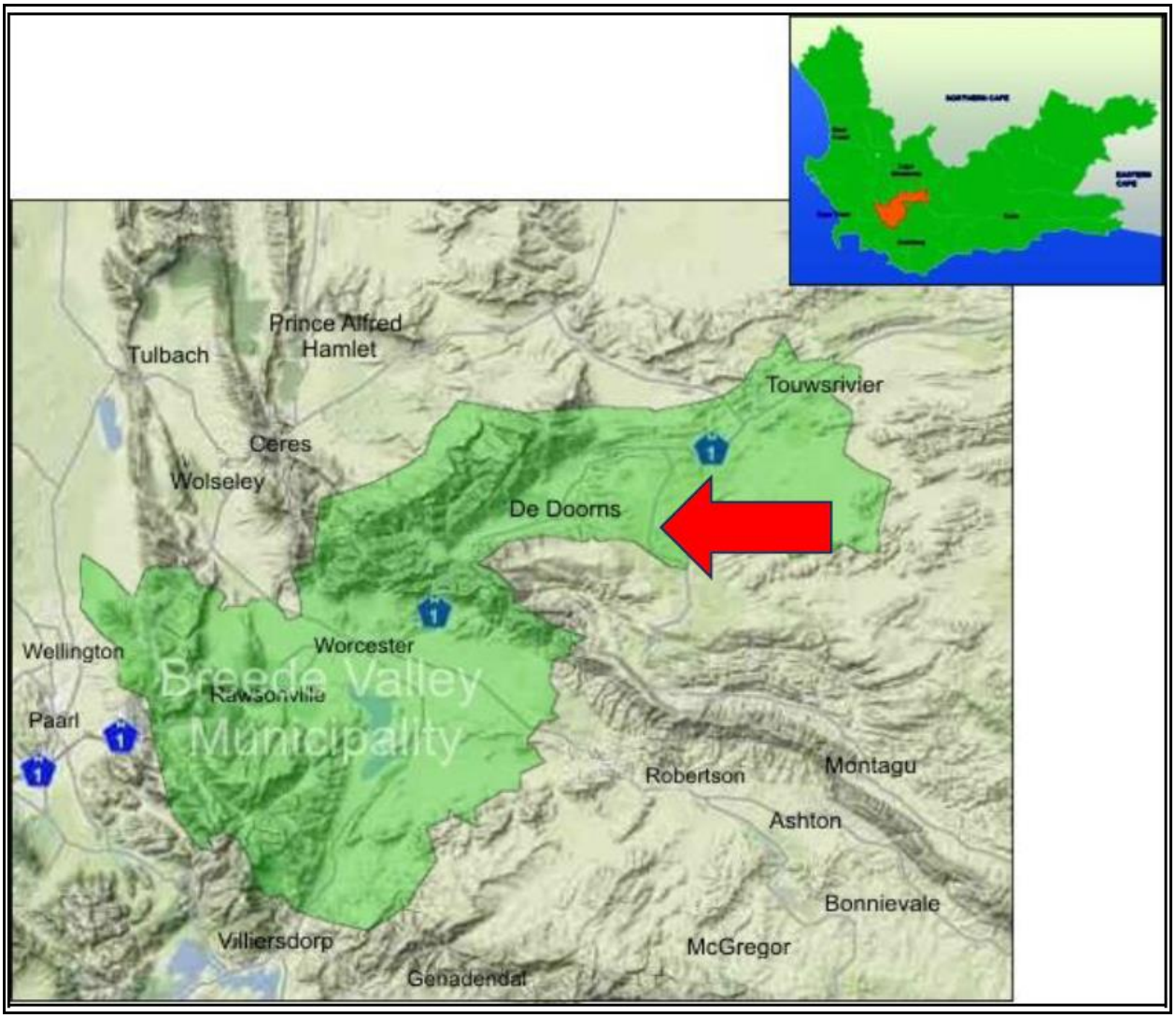


Figure 1.1: Location of Hugo WEF site (red arrow)

1.2 TERMS OF REFERENCE AND APPROACH

The terms of reference for the Scoping Level SIA require:

- A description of the environment that may be affected by the activity and the way the social environment may be affected by the proposed development.
- A description of the baseline social and socio-economic conditions in the study area that have a bearing on the proposed development.
- An overview of the key policy and planning documents that have a bearing on the proposed development and the social assessment study.
- The identification of the potential social issues associated with the proposed development.
- Identification of potential enhancement and mitigation measures.
- Outline of the terms of reference for the Social Impact Assessment (SIA) to be undertaken during the Assessment Phase of the Environmental Impact Assessment (EIA).

The approach to the Scoping Level SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice.

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 in the study area.
- Site visit.
- Identification and assessment of the social issues associated with the proposed project.

Interviews with key stakeholders and interested and affected parties will be undertaken during the assessment phase. Annexure A contains a list of the secondary information reviewed. Annexure B summarises the assessment methodology that will be used to assign significance ratings during the assessment process.

1.3 PROJECT DESCRIPTION

The proposed Hugo WEF will comprise up to 48 turbines with a maximum output capacity of up to 360 MW with an anticipated lifespan of 20-25 years. The WEF will be located on the following land parcels: RE 147; RE/172; 0/173; RE/174; and 9/148 (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 7900 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 1.1: Landowners details Hugo WEF

Landowner	Farm Name	Farm No.	Portion No.
Blue Dot Prop 424	Ou de Kraal	145	RE
Blue Dot Prop 424	Stinkfonteins Berg	147	RE
Blue Dot Prop 424	Stinkfontein	172	RE
Marius Hugo	Driehoek	173	0
Marius Hugo	Presents Kraal	174	RE
Dirk Uys Boerdery PTY LTD	Helpmakeer	148	9
Overhead Transmission Line			
Marius Hugo	Presents Kraal	174	RE
Dirk Uys	Helpmakeer	148	9

Table 1.2: Technical details of Hugo WEF

Maximum Generation Capacity	up to 360MW
Type of technology	Onshore Wind
Number of Turbines (Photograph 1.1)	Up to 48
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	±26500m³ for the construction, commissioning and test phase (±26 months), the majority being consumed during year-one of the construction. ±90m³/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

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

Identification of social issues
The identification of social issues is based on the authors experience associated with undertaking in the region of 160 SIAs for renewable energy facilities and associated infrastructure (substations, transmission lines, roads etc.), including SIAs for projects in the study area. Based on this the author is confident that the majority of social issues have been identified. As indicated above, interviews with affected landowners will be undertaken during the Assessment Phase of the SIA.

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

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

Fit with planning and policy requirements
Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard, a key component of the SIA process is to assess the proposed development in terms of its fit with key planning and policy documents. As such, if the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the development, the development cannot be supported.

1.4.2 Limitations

Demographic data
The full list of 2022 Census data was not available at the time of preparing the report. The data from the 2011 and 2016 Household Community Survey is therefore referred to.

Interviews
Interviews with affected landowners and key stakeholders will be undertaken during the Assessment Phase of the SIA. However, as indicted above, the author is confident that the key social issues have been identified.

1.5 SPECIALIST DETAILS

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

1.6 DECLARATION OF INDEPENDENCE

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

1.7 REPORT STUCTURE

The report is divided into five sections, namely:

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

SECTION 2: POLICY AND PLANNING ENVIRONMENT

2.1 INTRODUCTION

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

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

- 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)
- Breede Valley Municipality Spatial Development Framework (2023).
- Breede Valley 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:

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

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

2.2.2 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 Protocol[2], Government

[2] The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". The Protocol was

is determined to make good the country's commitment to reducing greenhouse gas emissions. To this purpose, Government has committed itself to the development of a framework in which a national renewable energy framework can be established and operate.

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

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

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

2.2.4 Integrated 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

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).

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

Installed Capacity
Committed/Already Contracted Capacity
Capacity Decommissioned
New Additional Capacity
Extension of Koeberg Plant Design Life
Includes Distributed Generation Capacity for own use

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

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

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

In terms of renewable energy five bidding rounds have been completed for renewable energy projects under the RE IPP Procurement Programme. The most dominant technology in the IRP2019 is renewable energy from wind and solar PV technologies, with wind being identified as the stronger of the two technologies. There is a consistent annual allocation of 1 600MW for wind technology commencing in the year 2022 up to 2030. The solar PV allocation of 1 000MWs per year is incremental over the period 2022 to 2030, with no allocation in the years 2024 (being the year the Koeberg nuclear extension is expected to be commissioned) and the years 2026 and 2027 (presumably since 2 000MW of gas is expected in the year 2027). The IRP 2019 states that although there are annual build limits, in the long run such limits will be reviewed to take into account demand and supply requirements.

2.2.5 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 2021[3]. The first phase of the NIP 2050 focuses on four critical network sectors that provide a platform, namely, energy, freight transport, water, and digital infrastructure. In line with the NDP, the vision for the energy sector is to promote:

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

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

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

[3] Gazette No. 44951

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.

2.3.2 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 WCCCRS.

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).

2.3.3 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.

2.3.4 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.

2.3.5 Breede Valley Municipality Integrated Development Plan

The vision of the Breede Valley Municipality (BVM) is a *'A unique and caring Valley of service excellence, opportunity, and growth'*. The mission statement linked to the vision is *'To be a South African care capital by providing sustainable and affordable basic services in a safe and healthy environment, which promotes social and economic welfare through participative governance in a committed service-orientated approach and appreciates committed staff as the organisation's most valuable resource and key to service delivery'.*

The IDP lists 6 strategic objectives (SOs) that inform the vision, namely:

- SO1: To provide and maintain basic services and ensure social upliftment of the Breede Valley community.
- SO2: To create an enabling environment for employment and poverty eradication through proactive economic development and tourism.
- SO3: To ensure a safe, healthy, clean, and sustainable external environment for all Breede Valley's people.
- SO4: To provide democratic, accountable government for local communities and encourage involvement of communities and community organisations in the matters of local government.
- SO5: To ensure a healthy and productive workforce and an effective and efficient work environment.
- SO6: To assure a sustainable future through sound financial management, continuous revenue growth, corporate governance, and risk management practices.

SOs 1, 2 and 3 are relevant to the proposed development.

Chapter 5, the opportunity municipality, notes that the BVM strives to provide an opportunity for every resident to have access to all basic services and to live in a safe, caring and well-managed municipal environment. S0 1 and 2 are identified as the two SOs to drive this process. Chapter 5 lists a number of programmes linked to supporting SO 1 and 2. The programmes that are relevant to the development are:

- Programme 5.3: Implementing the local economic strategy.
- Programme 5.7: Unlocking the green economy.
- Programme 5.9: Rural development.

Programme 5.3: Implementing the local economic strategy. The IDP highlights the importance of prioritising infrastructure development as economic enabler for economic development. The importance to supporting SMMEs is also noted. The provision of energy infrastructure, such as the proposed renewable energy facility, supports this programme and will create opportunities to support SMMEs.

Programme 5.7: Unlocking the green economy.
The IDP notes that to address the challenges of climate change, Breede Valley Municipality will increasingly have to transition to a Green Economy in the future and refers to the current crisis in the electricity sector relating to electricity supply shortages and an increasing carbon footprint. The transition to a green economy is identified as tool to transform the current state of the local economy to one that is more sustainable from an economic, social, and environmental perspective. The transition includes transforming the local electricity sector to one that is more sustainable and aligned with the green economy concept. In this regard strategic green economic investments are expected to impact positively on several indicators across a number of sectors such as electricity supply, renewable energy share, employment and greenhouse gas emissions.

Programme 5.9: Rural development. The importance of supporting rural development is critical given the huge scale agricultural migration to the De Doorns area in recent years, including the annual influx of seasonal workers between September and March each year, when close to 11 000 workers are attracted to the area. This has huge implications for Breede Valley Municipality in its planning to deliver municipal services, especially refuse removal, proper clean toilets, running water for all, recreational facilities for children, access to housing, health services, crèche facilities and food security. The socio-economic development contributions associated with renewable energy developments can contribute towards supporting rural development projects.

2.2.3 Breede Valley Spatial Development Framework

The vision for the BVM is "A Breede Valley dedicated to providing efficient quality services by working in partnership with its citizens and businesses to enhance the quality of life and to create a safe, healthy and vibrant community in which to live, work, play and visit".
The vision is underpinned by six key development principles (DPs), namely:

- DP1: Economic Development.
- DP2: Vibrant Local Tourism.
- DP3: Enhanced residential character.
- DP4: Accessible social and civic facilities.
- DP5: Outdoor Lifestyle.
- DP6: Sustainable cities and communities

Development principles 1, 2, 5 and 6 are relevant to the proposed development.

Development Principle 1: Economic development. Identifies the need to establish a diverse economic base that attracts new business and investment.

Development Principle 2: Vibrant local tourism. The SDF notes that the Breede Valley's natural landscape, biodiversity, culture, and heritage provides a unique opportunity to promote its character and identity and refers to the need to establish scenic tourism routes and activities.

Development Principle 5: Outdoor lifestyle. The SDF highlights the importance of protecting and conserving environmental and other sensitive features.

Development Principle 6: Sustainable cities and communities. The SDF notes that the creation of resilient and sustainable urban environments requires the efficient use of resources and reduction of carbon emissions and the transition to a green economy system.

In terms of settlements, Worcester is identified as the area's primary node. The two settlements located near the site, De Doorns and Touwsriver are secondary nodes. De Doorns offers a range of service and commercial facilities and has become the business and shopping centre for the entire valley and surrounding settlements of Orchard and Stofland. The commercial activity, including major banks and retail outlets. The area also has a number of tourism opportunities in the form of wineries, restaurants, accommodation, and outdoors activities such as mountain biking and hiking. In terms of tourism, the area offers a number of tourism routes and activities.

Touwsrivier comprises of three areas.; firstly, the original Spoornet housing which is the original town; secondly, Topkamp is located east of the railway line and lastly Steenvliet which is located south of the original Spoornet housing. The commercial activity in Touwsrivier is clustered along Main Street. The SDF notes that the Steenvliet CBD is run down and redevelopment should be considered to create opportunities for the local community.

The SDF is informed by a set of Spatial Planning Categories (SPCs) based on the Western Cape Biodiversity Spatial Plan categories that also underpin the Provincial SDF. The SPCs are listed in Table XX.

Table XX: Sub-categories of each Spatial Planning Category (SPC)

SPC	**Description**
Core 1	These include habitats classified as highly irreplaceable, critically endangered, or endangered terrestrial (land), aquatic (rivers, wetlands & estuaries) and marine habitats.
Core 2	Includes compromised areas in a degraded condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. These areas should be rehabilitated and only low-impact, biodiversity-sensitive land-uses are appropriate.
Buffer 1	Areas may be degraded but still play an important role in supporting the functioning of Protected Areas and Critical Biodiversity Areas and are essential for delivering ecosystem services. These areas should be restored and/or managed to minimize impact on ecological infrastructure functioning.
Buffer 2	This category includes areas designated as Other Natural Areas, located in an extensive and/or intensive agriculture matrix as the dominant land use.
Intensive Agriculture	Includes areas comprised of a consolidation of the existing and potential intensive agricultural footprint. Significant or complete loss of natural habitat and ecological functioning has taken place.

Settlement	This includes existing cities, large and smaller towns, villages and hamlets.
Industry & Existing Mining	Areas are suitable for development but may still provide limited biodiversity and ecological infrastructure functions and should be managed in a way that minimises impacts on biodiversity and ecological infrastructure.

Figure 2.2 illustrates the location of natural open spaces in the BVM. As indicated in Figure 2.2, the study area appears to be located in an area identified as a Critical Biodiversity Area (green).

In terms of land uses, the main land use in the BVM is agriculture. The SDF notes that agricultural areas located near settlements should be reserved as prime agricultural land in the municipality and be protected from any development or land uses that may have a negative impact on the agricultural potential of the area. The SDF also highlights the importance of Agri-Tourism and the link with rural, agricultural landscapes.

The quality of the natural environment is also identified as a key attraction for tourism. The SDF notes that linked to the presence of high-quality natural environments in the municipality, one of the municipality's niche development areas is rural based tourism. Figure 2.3 illustrates the tourism opportunities in the area. As indicated in Figure 2.3, the site is located in an area designated as a critical biodiversity area (green).

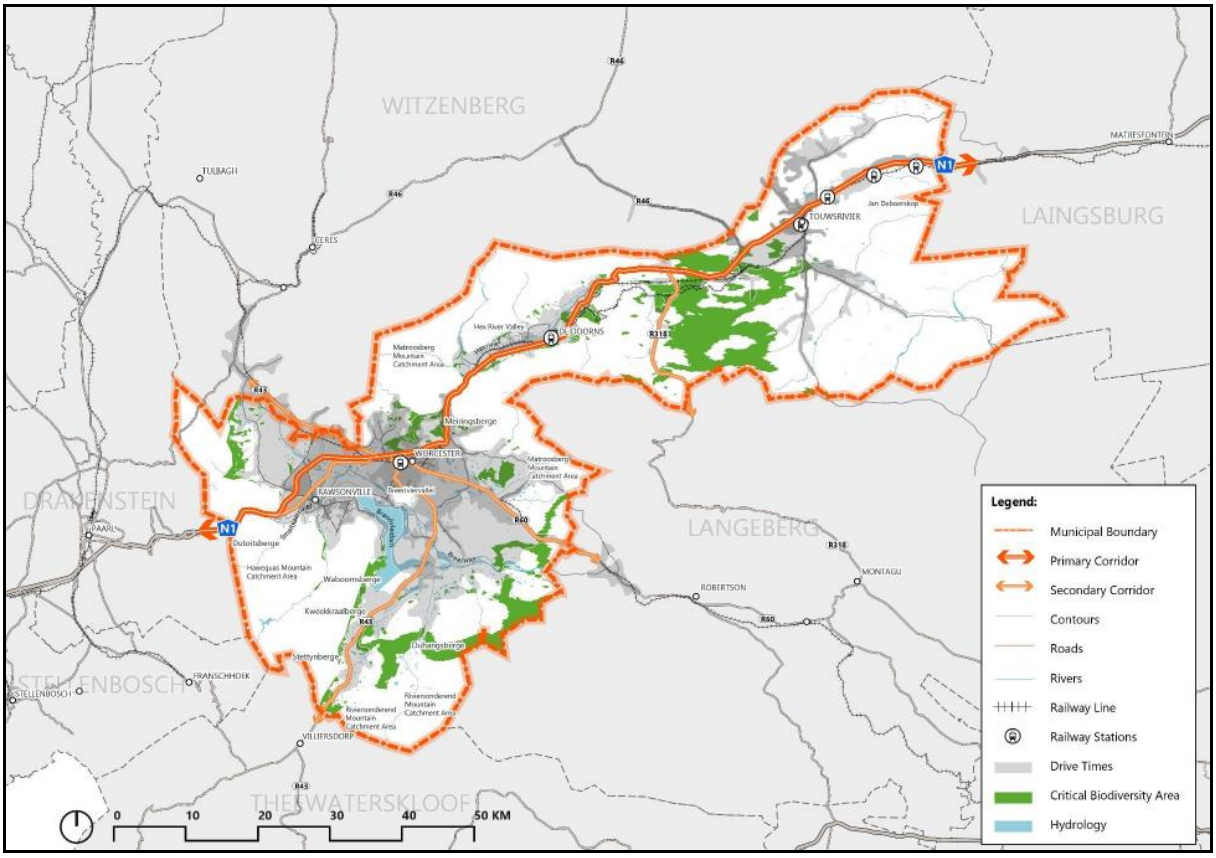


Figure 2.2: Natural Open Space

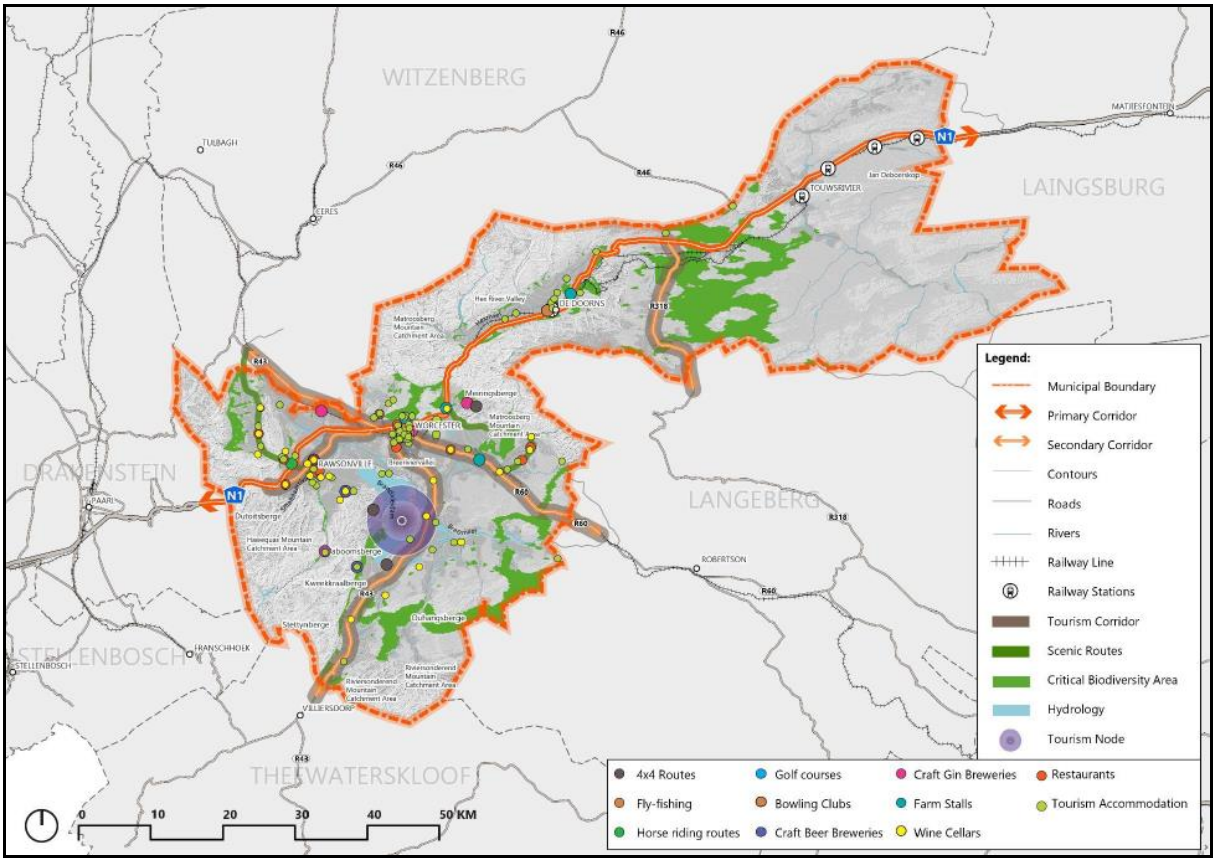


Figure 2.3: Natural Open Space

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. By2030, 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, 2022[4]):

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

Energy costs

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

Through the competitive bidding process, the IPPPP effectively leveraged rapid, global technology developments and price trends, buying clean energy at lower and lower rates with every bid cycle, resulting in SA getting the benefit of renewable energy at some of the lowest tariffs in the world. The price for wind power has dropped by 50% to R0.94/kWh, while solar PV has dropped with 75% to R1.14/kWh between BW1 and BW4.

Prices contracted under the REIPPPP for all technologies are well below the published REFIT prices. The REIPPPP has effectively translated policy and planning into delivery of clean energy at very competitive prices. As such it is contributing to the national aspirations of secure, affordable energy, lower carbon intensity and a transformed 'green' economy. with the BW4 price directly comparable with the per kWh price of new coal generation. Solar PV has dropped most significantly with a price decrease of 75% to R1.10/kWh between BW1 and BW4. This compares with the industry estimates in April 2020 of R1.45/kWh for Medupi. Considering the on-going delays incompletion, indications are that these costs may even be significantly higher.

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 costs[5]), 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

[4] 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.

[5] 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)

REIPPPP continued to generate investor confidence despite the poor economic conditions in South Africa in recent years.

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

South African citizen shareholding

The importance of retaining local shareholding in IPPs is key condition of the procurement requirements. The RFP notes that bidders are required to have South African Equity Participation of 40% in order to be evaluated. South African (local) equity shareholding across BW1-4 equates to 52% (R31.4 billion) of the total equity shareholding (R61.0 billion) was held by South African's across BW1 to BW4, 1S2 and 2S2. This equates to substantially more than the 40% requirement. Foreign equity amounts to R29.6 billion and contributes 49% of total equity.

The REIPPPP also contributes to Broad Based Black Economic Empowerment (BBBEE) and the creation of black industrialists. In this regard, Black South Africans own, on average, 34% of projects that have reached financial close (BW1-BW4), which is 4% higher than the 30% target. This includes black people in local communities that have ownership in the IPP projects that operate in or near their communities and represents the majority share of total South African Entity Participation.

On average, black local communities own 9% of projects that have reached financial close. This is well above the 5% target. In addition, an average of 21% shareholding by black people in engineering, procurement, and construction (EPC) contractors has been attained for projects that have reached financial closure. This is higher than 20% target. The shareholding by black people in operating companies of IPPs has averaged 30% (against the targeted 20%) for the 85 projects in operation (i.e. in BW1–4).

The target for shareholding by black people in top management has been set at 40%, with an average 68% achieved to date. The target has therefore been significantly exceeded.

Community shareholding and community trusts

The regulations require a minimum ownership of 2.5% by local communities in IPP projects as a procurement condition. This is to ensure that a substantial portion of the 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 Content[6]

The report notes that the REIPPP programme represents the country's most comprehensive strategy to date in achieving the transition to a greener economy. Local content minimum thresholds and targets were set higher for each subsequent bid window. The report notes that for a programme of this magnitude, with construction procurement spend alone estimated at 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 years[7] 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 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.

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

[7] The equivalent of a full-time employment opportunity for one person for one year

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 CO_2 ($MtonCO_2$) 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 ($20.5MtonCO_2$) achieved with only partial operations. A total of 72.1 Mton CO_2 equivalent reduction has been realised from programme inception to date.

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

2.4.2 Green Jobs Study

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

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

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

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

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

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

Broad green economy category		Segment	Technology/product	Total net direct employment potential in the long-term	Net direct manufacturing employment potential in the long-term	Total net direct employment potential (ST, MT, LT)	Net direct manufacturing employment potential (ST, MT, LT)
ENERGY GENERATION	Renewable (non-fuel) electricity	Wind power	Onshore wind power	5 156	2 105	VL, L, M	L, M, H
			Offshore wind power				
		Solar power	Concentrated solar power	3 014	608	N, VL, M	N, VL, M
			Photovoltaic power	13 541	8 463	M, H, H	H, VH, VH
		Marine power	Marine power	197	0	N, N, VL	N, N, N
		Hydro power	Large hydro power	272	111	VL, VL, VL	VL, M, VL
			Micro-/small-hydro power	100	0	VL, VL, VL	N, N, N
	Fuel-based renewable electricity	Waste-to-energy	Landfills	1 178	180	VL, VL, L	VL, VL, L
			Biomass combustion	37 270	154	VL, H, VH	VL, VL, L
			Anaerobic digestion	1 429	591	VL, VL, L	VL, L, M
			Pyrolysis/Gasification	4 348	2 663	VL, L, M	VL, H, H
			Co-generation	10 789	1 050	L, M, H	M, H, H
	Liquid fuel	Bio-fuels	Bio-ethanol	52 729	6 641	M, H, VH	L, H, VH
			Bio-diesel				
ENERGY GENERATION SUB-TOTAL				**130 023**	**22 566**		
ENERGY & RESOURCE EFFICIENCY		Green buildings	Insulation, lighting, windows	7 340	838	L, M, M	L, M, M
			Solar water heaters	17 621	1 225	L, H, H	L, M, H
			Rain water harvesting	1 275	181	VL, VL, L	VL, VL, L
		Transportation	Bus Rapid Transport	41 641	350	VH, VH, VH	H, M, L
		Industrial	Energy efficient motors	-566	4	VL, VL, VL	VL, VL, VL
			Mechanical insulation	666	89	VL, VL, VL	VL, VL, VL
ENERGY & RESOURCE EFFICIENCY SUB-TOTAL				**67 977**	**2 686**		
EMMISIONS 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
EMMISIONS 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 (CO_2) 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 CO_2 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 2.4).

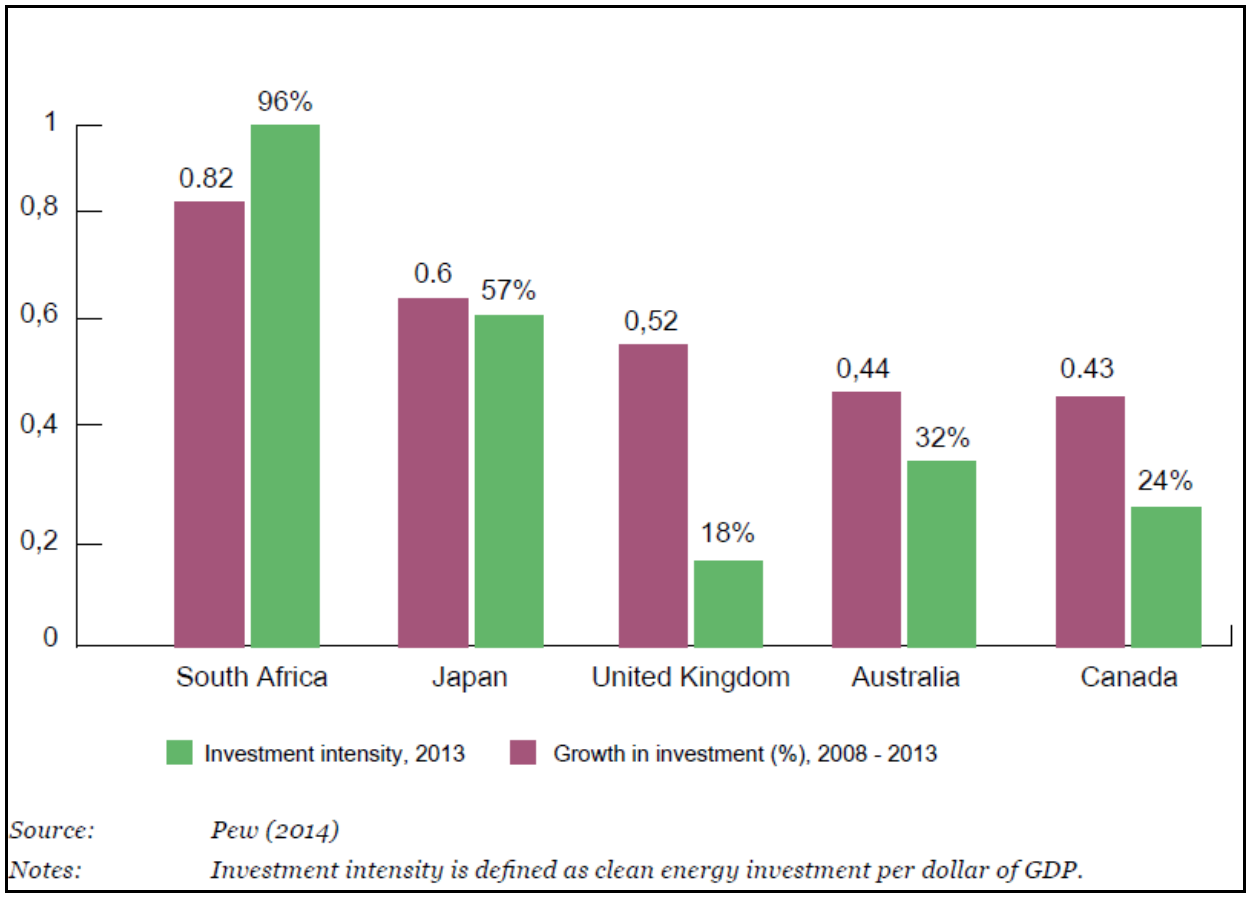


Figure 2.4: South Africa leads as a clean energy investment destination

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 flexibly 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 R*eport (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, Tait[8] 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.

[8] 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 Breede Valley Municipality (BVM) within the Western Cape Province (Figure 3.1). The BVM is one of five Local Municipalities that make up the Cape Winelands District Municipality. The town of Worcester is the administrative seat of the LM.

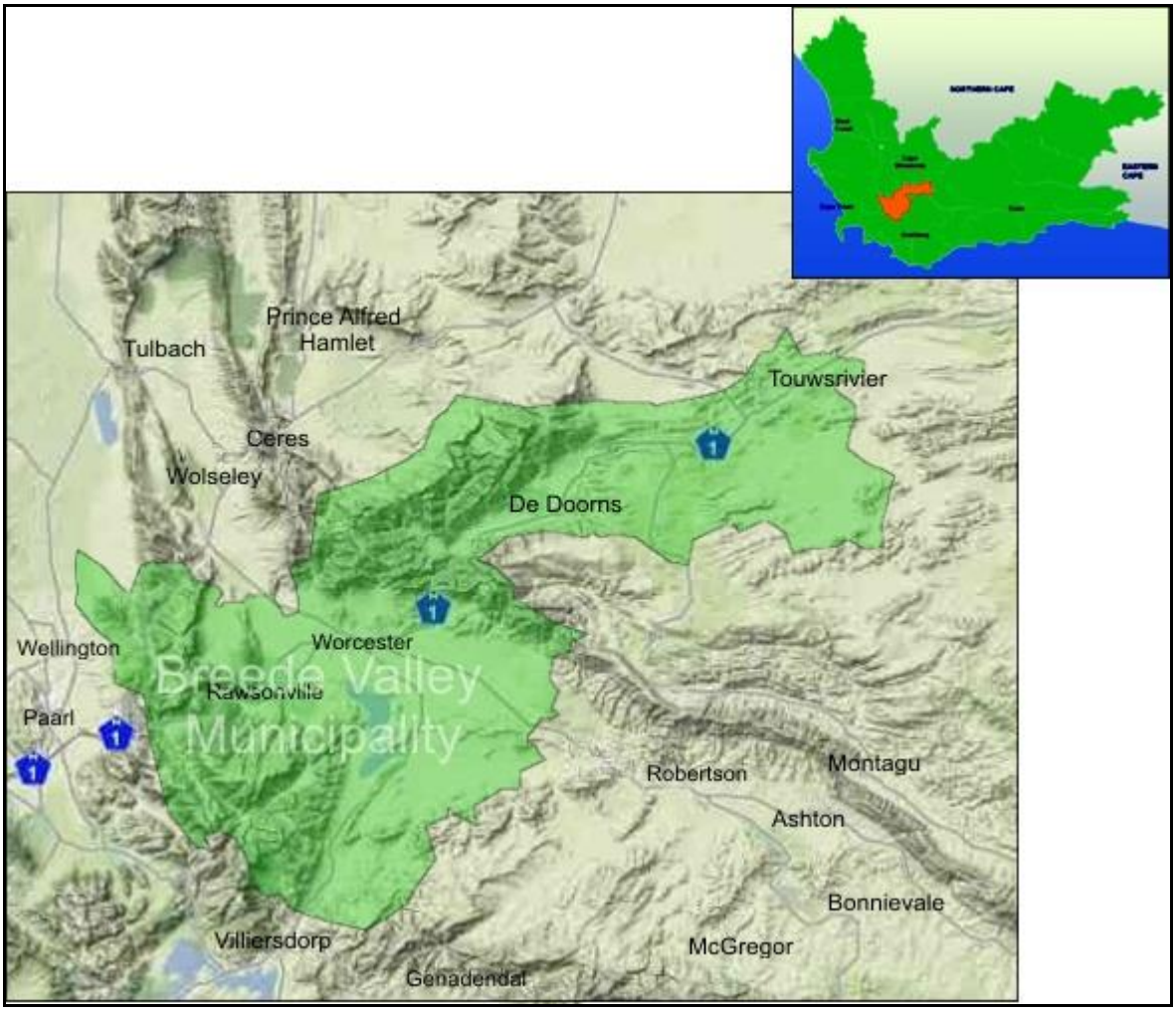


Figure 3.1: Location of Breede Vally Municipality within the Western Cape Province

3.3 DEMOGRAPHIC OVERVIEW

Population

The 2021 Socio-Economic Profile for the Breede Valley (BVM) prepared by the Western Cape Department of Social Development, indicates that the population of the BVM in 2021 was 194 555 making it the second most populated municipality in the Winelands district Municipality. The population is projected to be 200 911 by 2025 which equates to a 0.8 % annual average growth rate. Based on the 2022 Census data the population of the BVM was 212 682. The total number of households was 54 284, with an average household size of 3.9, the same as 2011.

Based on the SEP, young children under the age of 15 made up 28% of the population, the working age cohort (15-64) made up 66% and people 65 years and older made up 6%. Based on these figures the dependency ratio was 51%. Based in the data from Census 2022, children under the age of 15 made up 23.4% of the population, the working age cohort (15-64) made up 70.5% and people 65 years and older made up 6.1%. Based on this figure the dependency ratio was 41.9%. 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 64%, followed by Black Africans (22%) and Whites (13%) and. The main first language spoken was Afrikaans (77%), followed IsiXhosa (18%) by English (2%) and (Community Household Survey 2016).

Households, house types and owernship

The 2022 Census data indicates that 87.7% of the households resided in formal dwellings, compared to 77.9% in 2011. This information is worth considering within the context of the 2016 Household Community Survey which found that 70.8% of households lived in formal dwellings, while 20.4% resided in informal dwellings. The 2021 SEP for the BVM provides a figure of 76.2% for the number of formal dwellings. The significant difference between the 2022 Census results and other sources does raise concerns regarding the accuracy of the 2022 Census data, specifically give the influx of jobseekers into the area and the increase in informal settlements in and around De Doorns.

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, 12.2% of the population of the BVM had no formal income, 1.8% earned less than R 4 800, 2.9% earned between R 5 000 and R 10 000 per annum, 14.9% between R 10 000 and R 20 000 per annum and 22.2% 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 54% of the households in the BVM 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 BVM to maintain and provide services.

Employment

The 2021 Socio-Economic Profile for the BVM Municipality notes that the unemployment rate in the BVM has been in the region of 10% over the last 10 years and was 10.7% in 2020 (Figure 3.2). The figures are similar to those for the WDM and lower than provincial figures over the same period. The figure for the Western Cape in 2020 was 18.9%.

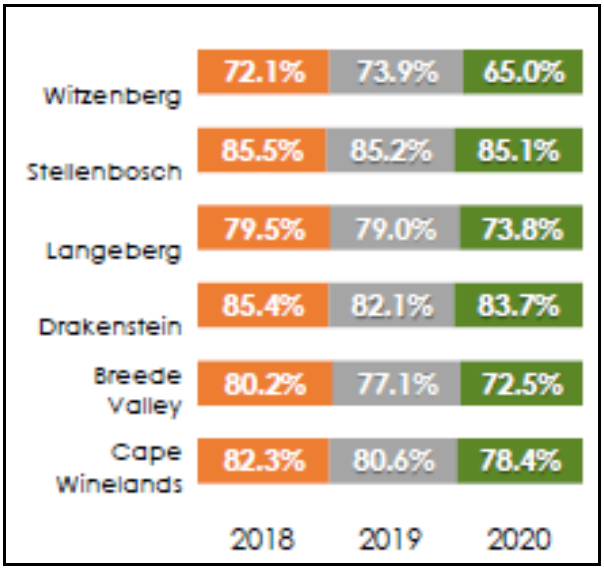
Unemployment rates	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Drakenstein	13.1	13.4	13.1	12.7	13.1	12.1	13.1	13.7	13.6	14.5	14.1
Langeberg	6.4	6.6	6.5	6.2	6.5	5.6	6.4	6.7	6.7	7.3	7.3
Stellenbosch	9.8	10.1	10.0	9.7	10.1	9.3	10.3	10.7	10.7	11.6	11.3
Witzenberg	7.3	7.4	7.1	6.7	6.9	5.9	6.4	6.7	6.6	7.1	6.9
Breede Valley	**10,3**	**10.6**	**10.3**	**9.8**	**10.2**	**9.1**	**10.0**	**10.4**	**10.3**	**11.1**	**10.7**
Cape Winelands	10.1	10.3	10.1	9.7	10.0	9.1	10.0	10.4	10.3	11.1	10.8
Western Cape	15.9	16.1	16.1	16.0	16.4	16.5	17.7	18.4	18.3	19.6	18.9

Source: SEP BVM 2021

Figure 3.2: Unemployment rates for Breede Valley Municipality

Education

Based on the information contained in the SEP, the matric pass rate in the BVM was 72.5% in 2022, down from 77.1% in 2019 and 82.3% in 2018. After the Witzenberg Municipality, the BVM had the lowest matric pass rate in the WDM (Figure 3.3)



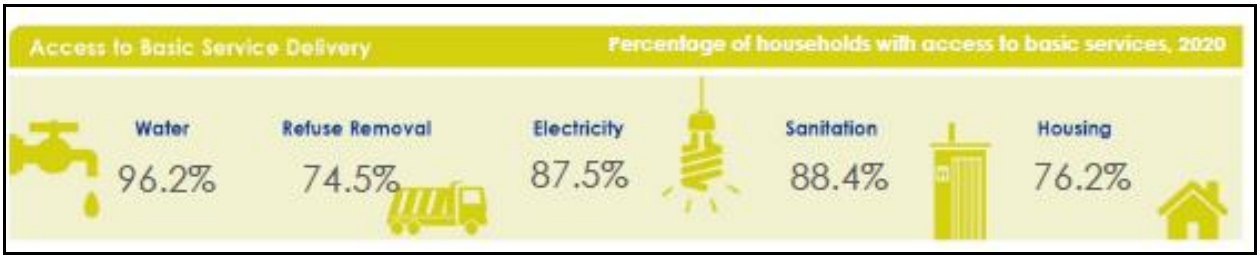
Source: SEP BVM 2021

Figure 3.3: Matric pass rates for BVM and CWDM

3.4 MUNICIPAL SERVICES

Based on the information from the 2022 SEP 87.5% of households in the BVM had access to electricity, 96.2% had access to water, 88.4% had access to sanitation services, and 74.5% had their refuse removed on a regular basis (Figure 3,4). In summary, service levels in the BVM can be described as good.

The figures from the 2022 Census indicate that 97.2% have access to electricity, 84.7% access to piped water, 94.9% are connected to sewage, and 83.4% have access to weekly refuse collection services. Once again, the Census figures are significantly better than the 2021 SEP figures. This raises concerns specifically given the relatively high number of informal dwellings in the BVM.



Source: SEP BVM 2021

Figure 3.4: Summary of municipal services

3.5 HEALTH AND EDUCATION FACILITIES

Education facilities

Based on the 2021 SEP there are 58 schools in the BVM, of which 46 (79%) are no-fee schools. This reflects the low income levels in the area. Less than 50% of the schools, (46%) are equipped with libararies.

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 is 1 regional hospital in the BVM (Worcester), 1 Community Day Centre, 9 PHC Clinics (Satellite and Mobile) and 6 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 rates[9], percentage of malnourished children[10], neonatal

[9] **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.

[10] **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.

mortality rate[11] and birth weight[12]. The immunisation coverage rate for children under the age of one in the BVM was 58.2% compared to 60.6% for the CWDM. These rates are low compared to other areas, for example the Central Karroo District was 71.3% in 2018/19. The number of malnourished children under five years (per 100 000) in 2021 was 1.6, while the neonatal mortality rate (NMR) (deaths per 1 000 live births before 28 days of life) was 20.1 and the low birth weight was 19.7, compared to 15.5 and 10.7 for the CWDM. The child health care conditions in the BVM are therefore poor compared to the district.

3.6 ECONOMIC OVERVIEW[13]

Economic activity in the BVM 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 BVM was dominated by the tertiary sector which contributed 69% towards the Gross Domestic Product for the Region (GDPR)[14] in 2019, followed by the Secondary Sector (21%) and the Primary Sector (10%) (Figure 3.5). Within Tertiary Sector, the most important subsectors were Finance, insurance, real estate and business services (21% towards GGDP) and Wholesale and retail trade, catering and accommodation (19% towards GGDP), each contributing more than the entire Primary Sector. The Agriculture, forestry and fishing subsector within the Primar Sector contributed 9% towards GGDP.

Employment
In terms of employment, the Tertiary Sector was made up 64% of all jobs in 2019, followed by the Primary Sector (24%) and the Secondary Sector (12%) (Figure 3.5). However, in terms of subsectors the Agriculture, forestry and fishing sector was the most important sector in 2019, making up 23.5% of all jobs, followed by Wholesale and retail trade, catering and accommodation (22%), and Finance, insurance, real estate and business services (16%). 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 (41%), followed by semi-skilled (40.3%) and skilled (18.7%) workers. The high percentage of low and semi-skilled workers is linked to the agricultural sector.

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[11] **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.

[12] **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.

[13] Information on the local economy is based on the 2021 Socio-Economic Profile of the BVM prepared by the Western Cape Provincial Government.
[14] 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 2019	Trend 2015 –2019	Real GDPR growth 2020e	Number of jobs 2019	Average annual change 2015 - 2019	Net change 2020e
PS	Primary Sector	1 228.5	-3.9	10.6	20 211	364	-851
	Agriculture, forestry & fishing	1 199.7	-3.9	11.2	20 177	365	-848
	Mining & quarrying	28.8	-0.3	-18.6	34	-1	-3
SS	Secondary sector	2 841.7	0.6	-11.5	10 300	142	-902
	Manufacturing	1 834.5	0.7	-9.0	6 046	52	-399
	Electricity, gas & water	262.9	-2.9	-8.4	176	-1	-7
	Construction	744.2	1.6	-19.9	4 078	91	-496
TS	Tertiary sector	9 230.9	2.1	-5.5	55 256	1 412	-2 953
	Wholesale & retail trade, catering & accommodation	2 560.9	1.8	-9.8	18 682	646	-1 180
	Transport, storage & communication	1 419.7	0.8	-15.2	3 298	86	-118
	Finance, insurance, real estate & business services	2 747.4	4.4	-1.7	14 024	538	-531
	General government	1 394.5	-1.0	-1.0	6 888	- 71	15
	Community, social & personal services	1 108.3	1.1	-2.5	12 364	214	-1 139
	Breede Valley	13 301.0	1.0	-4.9	85 767	1 917	-4 706

Source: SEP BVM 2021

Figure 3.5: Summary of GDPR and Employment for BVM

3.7 OVERVIEW OF STUDY AREA

As indicated above, the study area is located ~ 13km east of De Doorns, 20 km southwest of Touws River and 6km south of the N1, within the Breede Valley Municipality (BVM). As indicated in Figure 3.6, the site straddles the R 318 which is a designated tourist route in terms of the Langeberg SDF (2023). The R318 links Montagu to the south to the N1 to the north. The proposed Khoe WEF is located ~ 8-10 km south of the Hugo 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 Hugo 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 that are located in the Langeberg Municipality. In addition to these the Bokkerivier and Elim nature reserves are located to the north of the N2, within 10 km of the site, and the Kamagu Safari Lodge and Hartebeeskraal Hunting Game Farm is located ~ 5km to the north east of the site.

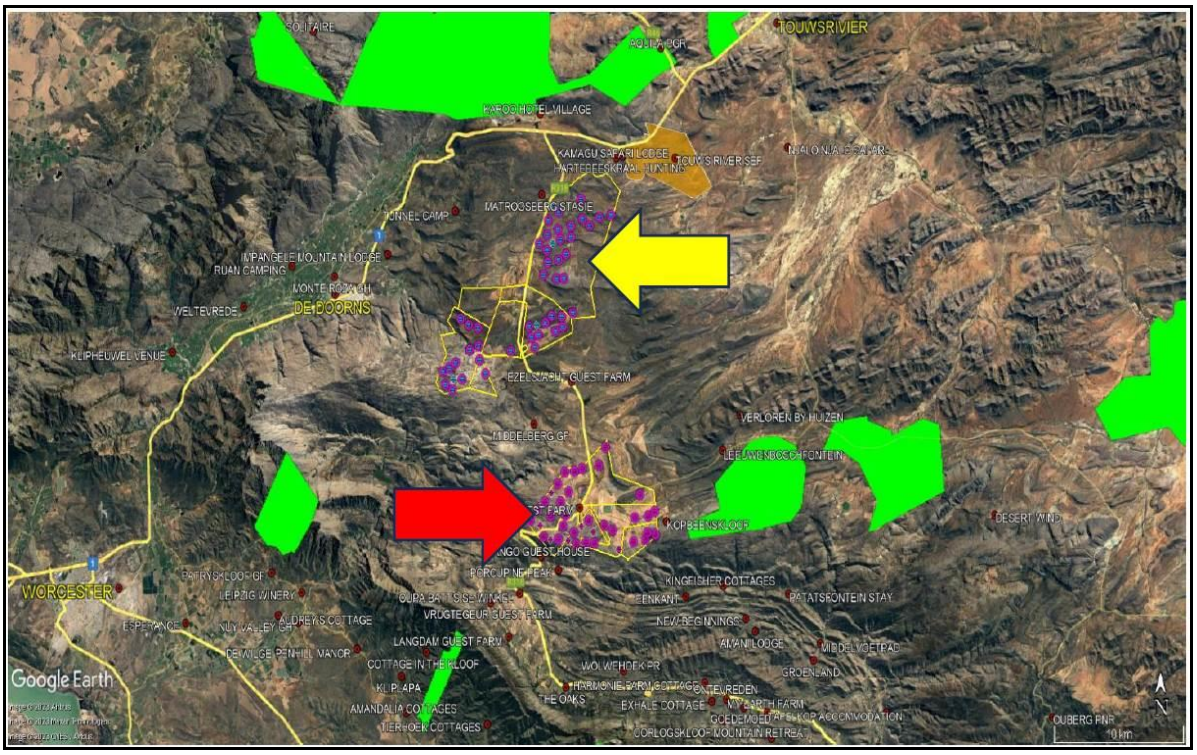

Figure 3.6: Location of Hugo WEF (yellow) in relation to Khoe WEF (red) and nature reserves

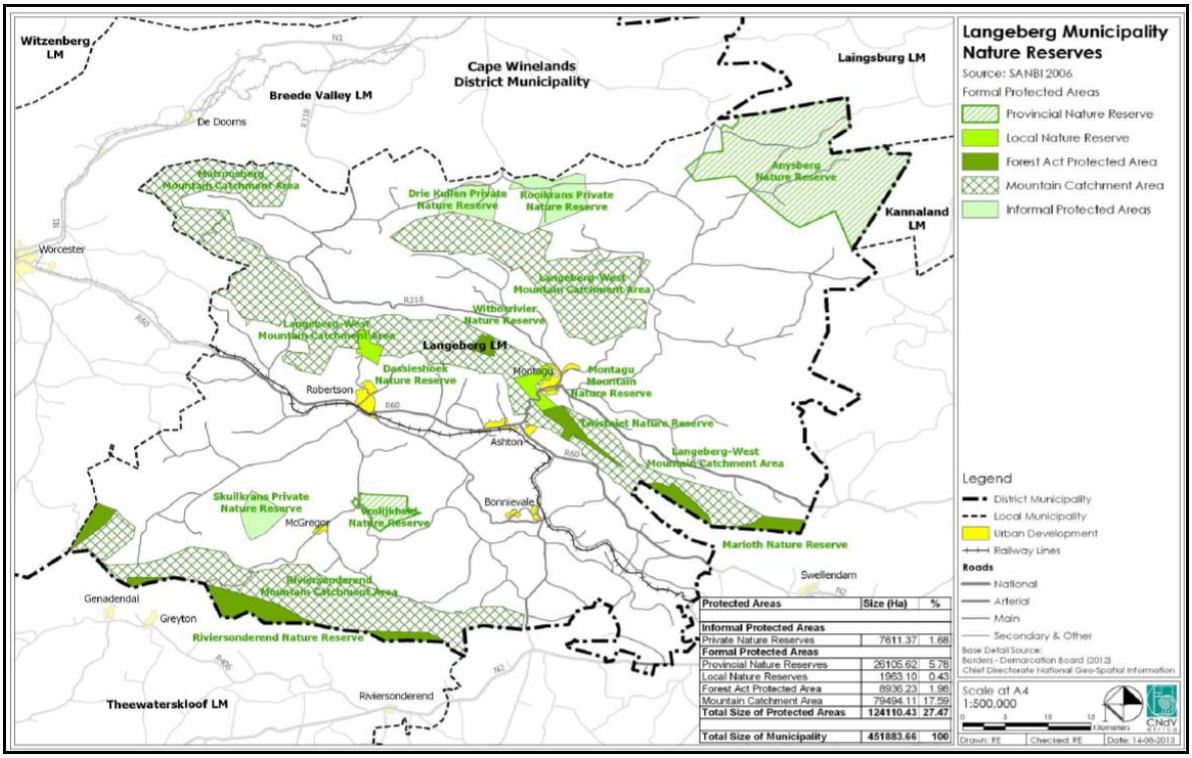

Figure 3.7: Reserves and protected areas

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.
- Experience/ familiarity of the author with the area and local conditions.
- Experience with similar projects.

The section is divided into the following sections:

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

The key issues and significance ratings will be confirmed during the assessment phase.

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.

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 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 (2023 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

The capital expenditure will be approximately R 8 billion (2023 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.

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 years[15] have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. To date, 42 355 job years for SA citizens were achieved during construction, which is 26% above the planned 33 707 job years for active projects. These job years are expected to rise further since 23BW4 projects are still in or entering, construction.

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

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

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

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

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

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

Impact Phase: Construction							
Potential impact description: Creation of employment and business opportunities during the construction phase							
	Extent	**Duration**	**Severity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	M	Positive	Medium	M	High
With Mitigation/ Enhancement	H	L	H	Positive	Medium	H	High
Can the impact be reversed?			Yes: By not implementing the project				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

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

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

project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.
- Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.
- The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.

Business
- The proponent should liaise with the BVM 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.

4.3.2 Impact of construction workers on local communities

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

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

The objective will be to source as many of the low and semi-skilled workers locally. These workers will be from the local community and form part of the local family and social networks. This will reduce the risk and mitigate the potential impacts on the local community. While it is possible to reduce the risks associated with construction workers it is not possible to totally avoid the potential impacts.

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

Impact Phase: Construction							
Potential impact description: Potential impacts on family structures and social networks associated with the presence of construction workers							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	M	Negative	Medium	M	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes, for some impacts but not all. The risk cannot be eliminated.				
Will impact cause irreplaceable loss or resources?			N/A				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

Recommended mitigation measures
- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents.
- Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.
- The proponent and contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP.
- The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP.
- No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

4.3.3 Influx of job seekers

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed project on its own does not constitute a large construction project, the establishment of a number of renewable energy projects in the area may attract job seekers to the area. As in the case of construction workers employed on the project, the actual

presence of job seekers in the area does not in itself constitute a social impact. However, the way in which they conduct themselves can impact on the local community. The main areas of concern associated with the influx of job seekers include:

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

These issues are similar to the concerns associated with the presence of construction workers and are discussed in Section 4.3.2. 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

Impact Phase: Construction							
Potential impact description: Potential impacts on family structures, social networks and community services associated with the influx of job seekers							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes, for some impacts but not all. The risk cannot be eliminated.				
Will impact cause irreplaceable loss or resources?			N/A				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

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

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

4.3.4 Risk to safety, livestock, and farm infrastructure

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

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

Impact Phase: Construction							
Potential impact description: Potential risk to safety of farmers and farm workers, livestock and damage to farm infrastructure associated with the movement of construction workers on and to the site							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	M	Negative	Medium	M	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes: By repairing damage and compensating for stock losses etc.				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as the current status quo would be maintained.

Recommended mitigation measures
- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.
- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for.
- All farm gates must be closed after passing through.
- Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.
- The proponent should establish a CoC for workers (see above).
- The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below).

- The proponent should implement a Grievance Mechanism that provides local farmers with an effective and efficient mechanism to address issues related to report issues related to damage to farm infrastructure, stock theft and poaching etc.
- The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.
- Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.
- Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the CoC. All dismissals must be in accordance with South African labour legislation.
- It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.

4.3.5 Nuisance impacts associated with construction related activities

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

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

Impact Phase: Construction							
Potential impact description: Potential dust and safety impacts and damage to road surfaces associated with movement of construction related traffic to and from the site							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	M	Negative	Medium	M	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes, by rehabilitating disturbed areas				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

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

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.

- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- Ongoing communication with landowners and road users during construction period. This should be outlined in the SEP.
- The proponent should implement a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads.
- Implementation of a road maintenance programme throughout the construction phase to ensure that the affected roads maintained in a good condition and repaired once the construction phase is completed.
- Repair of all affected road portions at the end of construction period where required.
- Dust suppression measures must be implemented on un-surfaced roads, such as wetting on a regular basis and ensuring that vehicles used to transport building materials are fitted with tarpaulins or covers.
- All vehicles must be roadworthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.

4.3.6 Increased risk of grass fires

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, wildlife and farm infrastructure. The area is susceptible to grass fires during the summer months (October-May).

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

Impact Phase: Construction							
Potential impact description: Potential loss of grazing for livestock and damage to farm infrastructure.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	M	Negative	Medium	M	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes: By repairing damage and compensating for damages and losses				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The mitigation measures include:

- Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.

- Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.
- The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.
- Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.
- Smoking on site should be confined to designated areas.
- Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy summer months.
- Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.
- Contractor should provide fire-fighting training to selected construction staff.
- No construction staff, 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 must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.

4.3.7 Impacts associated with loss of farmland

The activities associated with the construction phase and establishment of the proposed project and associated infrastructure will result in the disturbance and loss of land available for crops and grazing. However, experience from other WEFs 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. 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 productive farmland**

Impact Phase: Construction							
Potential impact description: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the WEFs and power lines will impact on grazing.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	M	Negative	Medium	M	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes, by rehabilitating disturbed areas				

Will impact cause irreplaceable loss or resources?	No, however, disturbed areas will need to be rehabilitated
Can impact be avoided, managed, enhanced and or mitigated?	Yes, see below

Assessment of No-Go option
There is no impact as it maintains the current status quo.

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

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

4.4 OPERATIONAL PHASE SOCIAL IMPACTS

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

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

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

4.4.1 Improve energy security and support the renewable energy sector

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

Table 4.8: Improve energy security and support renewable sector

Impact Phase: Operational							
Potential impact description: Development of infrastructure to generate clean, renewable energy and improve energy security.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	M	Positive	Medium	M	High
With Mitigation/ Enhancement	M	H	M	Positive	High	H	High
Can the impact be reversed?			Yes, by removing infrastructure				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
Should the proposed WEF be approved the proponent should:

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

4.4.2 Creation of employment and business opportunities

The proposed development will create~ 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 (2023 Rand values), including wages.

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

Impact Phase: Operational							
Potential impact description: Creation of employment and business opportunities associated with the operational phase							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	L	M	L	Positive	Low	H	High
With Mitigation/ Enhancement	L	M	L	Positive	Low	H	High
Can the impact be reversed?			Yes, by removing project				
Will impact cause irreplaceable loss			No				

or resources?	
Can impact be avoided, managed, enhanced and or mitigated?	Yes, measures will be provided in the Assessment Report

Recommended enhancement measures
The enhancement measures listed in Section 4.3.2, i.e., to enhance local employment and business opportunities during the construction phase, also apply to the operational phase. In addition, the proponent should investigate providing training and skills development to enable locally based service providers to provide the required services for the operational phase.

4.4.3 Generate income for affected landowners

The proponent will be required to either purchase the land or enter into a rental agreement with the affected landowners for the use of the land for the establishment of the proposed WEF. Farming operations are impacted by droughts and market fluctuations. Any additional source of income therefore represents a t 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 affected farmer(s)

Impact Phase: Operational							
Potential impact description: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for farming inputs, such as fertilizers, fuel, feed etc.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	L	Positive	Low	L	High
With Mitigation/ Enhancement	M	M	M	Positive	Medium	H	High
Can the impact be reversed?			Yes, by not implementing agreements				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

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

4.4.4 Benefits associated with the socio-economic development contributions

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

- Creation of jobs.
- Education.
- Support for and provision of basic services.
- School feeding schemes.
- Training and skills development.
- Support for SMME's.

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

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

Impact Phase: Operational							
Potential impact description: SED contributions funded by revenue generated from the sale of energy. The revenue can be used to fund local community development							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	H	M	Positive	Medium	L	High
With Mitigation/ Enhancement[16]	M	H	M	Positive	Medium	H	High
Can the impact be reversed?			Yes, by not implementing project				

[16] Assumes effective management of Community Trust

Will impact cause irreplaceable loss or resources?	No
Can impact be avoided, managed, enhanced and or mitigated?	Yes, see below

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

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

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

4.4.5 Visual impact and impact on sense of place

The proposed WEF will impact on the areas existing rural sense of place. Based on the available information there are several nature reserves and tourist facilities in the area. The attraction of these areas is likely to be 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 therefore exists and will need to be assessed during the Assessment Phase. The potential visual impact on the area's sense place will be informed by the findings of the VIA.

Table 4.12: Visual impact and impact on sense of place

Impact Phase: Operational							
Potential impact description: Visual impact associated with the proposed WEF and the potential impact on the areas rural sense of place.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	M	Negative	Medium	M	High
With Mitigation/ Enhancement	M	M	M	Negative	Medium	M	High
Can the impact be reversed?			Yes, by removing turbines				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option

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

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

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 likely to be 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 therefore exists. The potential impact on property values will need to be assessed during the Assessment Phase. The potential visual impact on the area's sense place will be informed by the findings of the VIA.

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

Impact Phase: Operational							
Potential impact description: Potential impact on property values and current operations linked to the visual impact associated with the proposed WEF and the potential impact on the areas rural sense of place.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	M	Negative	M (To be confirmed)	M	High
With Mitigation/ Enhancement	M	M	L-M	Negative	To be confirmed	M	High

Can the impact be reversed?	Yes, by removing turbines
Will impact cause irreplaceable loss or resources?	No
Can impact be avoided, managed, enhanced and or mitigated?	Yes, see below

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should be implemented.

4.4.7 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 review there is limited evidence to suggest that WEFs impact on tourism. However, as indicated above, there are several nature reserves and tourist facilities in the area. The attraction of these areas is likely to be 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 therefore exists. The potential impact on these operations will need to be assessed during the Assessment Phase. The potential visual impact on the area's sense place will be informed by the findings of the VIA.

Table 4.14: Impact on tourism in the region

Impact Phase: Operational							
Potential impact description: Potential impact of the WEF on local tourism							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	M	Negative	M (To be confirmed)	L	High
With Mitigation/ Enhancement	M	M	M	Negative	To be confirmed	L	High
Can the impact be reversed?			Yes, by removing turbines				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The recommendations contained in the VIA should be implemented.

4.5 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 impact on sense of place will be informed by the findings of the VIA.

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

Impact Phase: Operational							
Potential impact description: Cumulative visual impact associated with the establishment of a WEF on the areas rural sense of place and character of the landscape							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	M	Negative	Medium	M	Medium
With Mitigation/ Enhancement	M	M	M	Negative	Medium	M	Medium
Can the impact be reversed?			Yes, by removing turbines				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option

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

Recommended mitigation measures
- The recommendations contained in the VIA should be implemented.

4.6 CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The objective will be to source as many low and semi-skilled workers for the construction phase from the BVM and LM. 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 BVM to invest in up-grading local services where required. In 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 BVM.

Table 4.16: Cumulative impacts on local services

Impact Phase: Operational							
Potential impact description: The establishment of a number of renewable energy facilities has the potential to place pressure on local services, specifically medical, education and accommodation							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes, by implementing effective mitigation				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, measures will be provided in the Assessment Report				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

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

4.7 CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of renewable energy facilities and associated infrastructure, including the proposed WEF, will also create several socio-economic opportunities for the 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. However, steps must be taken to maximise employment opportunities for members from the local communities in the area and support skills development and training programmes.

Table 4.17: Cumulative impacts on local economy

Impact Phase: Operational							
Potential impact description: The establishment of a number of renewable energy facilities in the region will create employment, skills development and training opportunities, and the creation of downstream business opportunities.							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	H	M	Positive	Medium	L	High
With Mitigation/ Enhancement	M	H	M	Positive	Medium	M	High
Can the impact be reversed?			Yes, by not implementing project				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended enhancement measures
The proponent should create opportunities for local SMMEs during the operational phase.

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 commissioning[17]. 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.

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

Table 4.18: Impacts associated with decommissioning

Impact Phase: Decommissioning							
Potential impact description: Social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement	M	M	L	Negative	Low	M	High
With Mitigation/ Enhancement	M	L	L	Negative	Low	L	High
Can the impact be reversed?			Yes, by removing turbines				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

Assessment of No-Go option
There is no impact as it maintains the current status quo.

Recommended mitigation measures
The following mitigation measures are recommended:

- The proponent should ensure that retrenchment packages are provided for all staff retrenched when the WEF is decommissioned.
- All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.

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

[17] 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.

needs. South Africa is therefore one of the highest per capita producers of carbon emissions in the world and Eskom, as an energy utility, has been identified as the world's second largest producer carbon emissions.

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

Table 4.19: Assessment of no-development option

Impact Phase: No Development Option							
Potential impact description: The no-development option would result in the lost opportunity for the NLKM and a lost opportunity to supplement SAs current energy needs with clean							
	Extent	**Duration**	**Intensity**	**Status**	**Significance**	**Probability**	**Confidence**
Without Mitigation/ Enhancement [18]	M	H	M	Negative	Medium	H	High
With Mitigation/ Enhancement	M	H	M	Positive	Medium	H	High
Can the impact be reversed?			N/A				
Will impact cause irreplaceable loss or resources?			No				
Can impact be avoided, managed, enhanced and or mitigated?			Yes, see below				

[18] Assumes that the proposed WEF is not developed

SECTION 5: KEY FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

Section 5 lists the key findings of the Social Scoping study. These findings are based on:

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

5.2 SUMMARY OF KEY FINDINGS

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

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

The key issues and associated significance ratings will be confirmed during the assessment phase.

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.

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 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.

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

There are several nature reserves and tourist facilities in the area. The attraction of these areas is likely to be 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 therefore exists. The potential impact on these operations will need to be assessed during the Assessment Phase. The significance of the impacts associated with the operational phase are summarised in Table 5.2.

Table 5.2: Summary of social impacts during operational phase

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

5.2.4 Assessment of cumulative impacts

Cumulative impact on sense of place
The establishment of the WEF and other wind energy facilities in the area will create the potential for combined and sequential visibility impacts. The significance will be confirmed during the Assessment Phase.

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

Cumulative impact on local economy
The significance of this impact with enhancement was rated as **Moderate Positive**.

5.2.5 Decommissioning phase

Given the relatively small number of people employed during the operational phase (~ 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).

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 significant negative social cost.

5.3 CONCLUSION

The findings of the Social Scoping study indicate that the proposed Hugo WEF project will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy that will improve energy security in South Africa and contribute towards reducing the countries carbon footprint.

The potential negative impacts associated with the construction are likely to be **Low Negative** with mitigation. However, the proposed WEF is in an area that is likely to be visually sensitive and has the potential to impact negatively on a number of nature reserves and tourist facilities in the area. The attraction of these areas is likely to be linked to the rural character of the area, including the views and vistas. The potential impact on these operations will need to be assessed during the Assessment Phase.

5.4 PLAN OF STUDY FOR SIA

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

- Collection and review of reports and baseline socio-economic data on the area. This includes socio-economic characteristics of the affected areas, current and future land uses, and land uses planning documents relating to the study area and surrounds.
- Identification of the components associated with the construction and operational phase of the proposed project, including estimate of total capital expenditure, number of employment opportunities created and breakdown of the employment opportunities in terms of skill levels (low, medium and high skilled), breakdown of wages per skill level, assessment procurement policies etc.
- Site visit and interviews with key affected parties, including local communities, local landowners, key government officials (local and regional), the client, local farmers associations, tourism and conservation officials, chamber of commerce etc.

- Review of key findings of the key specialist studies that have a bearing on the SIA, such as the Visual Impact Assessment (VIA). This information will also be used to inform the engagement with the affected landowners.
- Identification and assessment of key social issues and assessment of potential impacts (negative and positive) associated with the construction, operational and decommissioning phase of the project.
- Identification and assessment of cumulative impacts (positive and negative).
- Identification of appropriate measures to avoid, mitigate, enhance, and compensate for potential social impacts.
- Preparation of Social Impact Assessment (SIA) Report.

Interviews will be undertaken with key stakeholders and interested and affected parties during the assessment phase.

ANNEXURE A

REFERENCES

- 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).

ANNEXURE B

METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

Assessment of Impacts and Mitigation

The significance of environmental aspects can be determined and ranked by considering the criteria presented in Table 1. In some cases it may be necessary to undertake the impact assessment to determine whether a particular aspect is significant. Therefore, a fair degree of iteration is unavoidable during the assessment process.

Table 1 – Criteria used to determine the significance of environmental aspects

Significance Ranking	Negative Aspects	Positive Aspects
H (High)	Will always/often exceed legislation or standards. Has characteristics that could cause significant negative impacts.	Compliance with all legislation and standards. Has characteristics that could cause significant positive impacts.
M (Moderate)	Has characteristics that could cause negative impacts.	Has characteristics that could cause positive impacts.
L (Low)	Will never exceed legislation or standards. Unlikely to cause significant negative impacts.	Will always comply with all legislation and standards. Unlikely to cause significant positive impacts.

The aspect identification and ranking process is largely a screening exercise whereby the aspects that do not have the potential to cause significant impacts are eliminated. Aspects ranked "high" and "moderate" are significant and the possible impacts associated with their presence will need to be determined. Aspects ranked "low" do not warrant further attention. The significance of the aspects should be ranked on the assumption that the management recommended in the EIA will be in place i.e. *with management*. This represents the scenario that the proponent wishes to have considered for approval. The environmental aspects associated with the proposed project activities during the construction, operational, closure phases (where appropriate) need to be identified. The influence of various project alternatives on the significance of the aspects must also be considered.

It may be desirable to also undertake a *without management* aspect ranking, since this highlights the sensitivity of the key risk areas to management and, hence, the management priorities. However, the dilemma in such an exercise is deciding on how much management to include. In the case of a mining project, for example, does one assume that the tailings dam will be completely absent or merely operated poorly? A useful rule of thumb is to assume that all the management required for operational reasons will be in place, but that any management specifically for environmental control will be absent. The danger in presenting *without management* ranking scenario in an EIA report is that it does not represent the scenario that the proponent wishes to have approved.

SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

Where significant environmental aspects are present ("high" or "moderate"), significant environmental impacts ***may*** result. The significance of the impacts associated with the significant aspects can be determined by considering the risk:

Significance of Environmental Impact (Risk) = Probability x Consequence

The consequence of impacts can be described by considering the severity, spatial extent and duration of the impact.

SEVERITY OF IMPACTS

Table 2 presents the ranking criteria that can used to determine the severity of impacts on the bio- physical and socio-economic environment. Table 3 provides additional ranking criteria for determining the severity of negative impacts on the bio-physical environment.

Table 2 – Criteria for ranking the *Severity* of environmental impacts

Type of Criteria	Negative			Positive		
	H-	M-	L-	L+	M+	H+
Qualitative	Substantial deterioration. Death, illness or injury.	Moderate deterioration. Discomfort.	Minor deterioration. Nuisance or minor irritation.	Minor improvement.	Moderate improvement.	Substantial improvement.
Quantitative	Measurable deterioration.		Change not measurable i.e. will remain within current range.		Measurable improvement.	
	Recommended level will often be violated.	Recommended level will occasionally be violated.	Recommended level will never be violated.		Will be within or better than recommended level.	
Community Response	Vigorous community action.	Widespread complaints.	Sporadic complaints.		No observed reaction.	Favourable publicity

Table 3 – Criteria for ranking the *Severity* of negative impacts on the bio-physical environment

Environment	Ranking Criteria		
	Low (L-)	**Medium (M-)**	**High (H-)**
Soils and land capability	Minor deterioration in land capability. Soil alteration resulting in a low negative impact on one of the other environments (e.g. ecology).	Partial loss of land capability. Soil alteration resulting in a moderate negative impact on one of the other environments (e.g. ecology).	Complete loss of land capability. Soil alteration resulting in a high negative impact on one of the other environments (e.g. ecology).
Ecology (Plant and animal life)	Disturbance of areas that are degraded, have little conservation value or are unimportant to humans as a resource. Minor change in species variety or prevalence.	Disturbance of areas that have some conservation value or are of some potential use to humans. Complete change in species variety or prevalence.	Disturbance of areas that are pristine, have conservation value or are an important resource to humans. Destruction of rare or endangered species.
Surface and Groundwater	Quality deterioration resulting in a low negative impact on one of the other environments (ecology, community health etc.)	Quality deterioration resulting in a moderate negative impact on one of the other environments (ecology, community health etc.).	Quality deterioration resulting in a high negative impact on one of the other environments (ecology, community health etc.).

Spatial Extent and Duration of Impacts
The duration and spatial scale of impacts can be ranked using the following criteria:

Table 4 – Ranking the *Duration* and *Spatial Scale* of impacts

	Ranking Criteria		
	L	**M**	**H**
Duration	Quickly reversible Less than the project life Short-term	Reversible over time Life of the project Medium-term	Permanent Beyond closure Long-term
Spatial Scale	Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/national

Where the severity of an impact varies with distance, the severity should be determined at the point of compliance or the point at which sensitive receptors will be encountered. This position corresponds to the spatial extent of the impact.

Consequence of Impacts

Having ranked the severity, duration and spatial extent, the overall consequence of impacts can be determined using the following qualitative guidelines:

Table 5 – Ranking the *Consequence* of an impact

			SEVERITY = H		
DURATION	Long-term	**H**			
	Medium-term	**M**			**MEDIUM**
	Short-term	**L**	**LOW**		
			SEVERITY = M		
DURATION	Long-term	**H**			**HIGH**
	Medium-term	**M**		**MEDIUM**	
	Short-term	**L**	**LOW**		
			SEVERITY = H		
DURATION	Long-term	**H**			
	Medium-term	**M**			**HIGH**
	Short-term	**L**	**MEDIUM**		
			L	**M**	**H**
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/national
			SPATIAL SCALE		

To use Table 5, firstly go to one of the three "layers" based on the severity ranking obtained from Table 2 and/ or Table 3. Thereafter determine the consequence ranking by locating the intersection of the appropriate duration and spatial scale rankings.

Overall Significance of Impacts

Combining the consequence of the impact and the probability of occurrence, as shown by Table 6, provides the overall significance (risk) of impacts.

Table 6 – Ranking the *Overall Significance* of impacts

PROBABILITY	Definite Continuous	**H**	**MEDIUM**		**HIGH**
	Possible Frequent	**M**		**MEDIUM**	
	Unlikely Seldom	**L**	**LOW**		**MEDIUM**
			L	**M**	**H**
			CONSEQUENCE (from Table 5)		

The overall significance ranking of the negative environmental impacts provides the following guidelines for decision making:

Table 7 – Guidelines for decision-making

Overall Significance Ranking	Nature of Impact	Decision Guideline
High	Unacceptable impacts.	Likely to be a fatal flaw.
Moderate	Noticeable impact.	These are unavoidable consequence, which will need to be accepted if the project is allowed to proceed.
Low	Minor impacts.	These impacts are not likely to affect the project decision.

ANNEXURE C

Tony Barbour
ENVIRONMENTAL CONSULTING

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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.

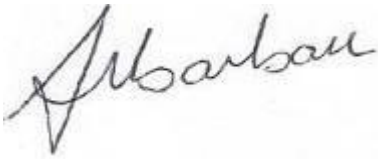
ANNEXURE D

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):

24 November 2023

Date: